Geneva Health Forum 2022 Poster Book

The Covid-19 Pandemic and Environmental Emergency: Reinventing Global Health in Times of Global Change

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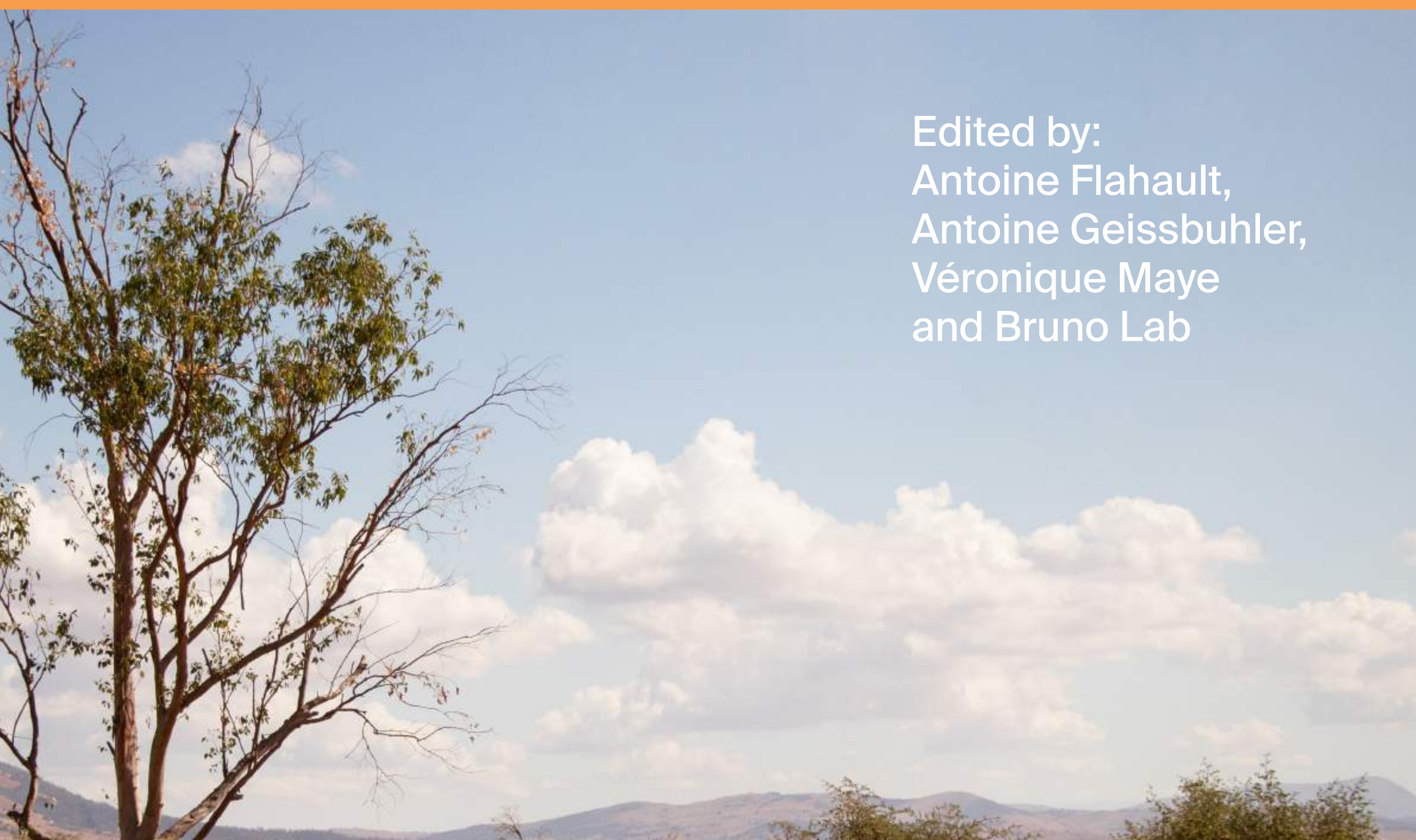

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Antoine Flahault,
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Geneva Health Forum 2022
Poster Book

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Preface

Background: Social and environmental crises are increasingly impacting the health of populations. Inequalities in access to care are growing, and the current design of health systems is becoming increasingly fragile and inadequate to address these challenges. It is crucial to reinvent a new approach to global health that takes into account the current social and environmental crises, that further involves civil society and academia, and harnesses the opportunities of digital development. In these times of significant international tension, it is of utmost importance for Geneva to reinforce its unique position as a neutral platform for multilateral dialogue.

About the Geneva Health Forum: The Geneva Health Forum (GHF) is a platform for innovative practices in global health, a space for science-based and inclusive diplomacy. Established in 2006 by the University Hospitals of Geneva (HUG) and the University of Geneva (UNIGE), the Geneva Health Forum is organized in close collaboration with 24 partners, including prominent international organizations based in Geneva, such as the WHO, International Committee of the Red Cross (ICRC), Global Fund, GAVI, Médecins Sans Frontières (MSF), and the UN.

The mission of the Geneva Health Forum is to contribute to the improvement of health and access to health care worldwide. To achieve this goal, it aims to give visibility to innovative field experience, to establish a constructive dialogue between global health actors from different sectors, as well as to foster collaborations between them.

Conference Poster Submission: Each edition of the GHF conference places significant emphasis on the presentation of research projects. Indeed, research conducted by both students and established researchers, is a key driver of innovation, and inspires the development of new practices in access to care. Presenting research results in the form of posters is a meticulous and high-quality exercise. In turn, strategic dissemination of these posters offers their authors new opportunities to reach a wider audience.

True to its multidisciplinary approach, the GHF welcomes professionals from all fields working in the health sector. From May 3 to 5, 2022, the ninth edition of the Geneva Health Forum took place in a hybrid format, hosting over 100 posters. The present collection of 106 posters covers a wide range of critical topics. We hope you enjoy reading through these posters and look forward to welcoming you to the next edition of the GHF in May 2024.

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LAGAZEL: Solidarity of Off-Grid Solar Solutions

Arnaud Chabanne
Lagazel, Saint Etienne, France

In Africa, 650 million people live with no energy access. Those populations use non-reliable and non-sustainable solutions (oil or battery-operated lamps), which are dangerous for health and expensive. Nursing staff struggles to deal with night emergencies, and in a general way, all activities must basically stop around 6 p.m. Since 2015, Lagazel has been the first company to manufacture quality solar lamps and innovative solar kits in Africa, aiming to propose a solution to this issue. In Burkina Faso and Benin, about forty locally trained technicians produce sustainable solar equipment, which passed Lighting Global's quality standards. Today, more than 15 000 people benefit from Lagazel's solutions within seven African countries. Some of them are nursing staff and doctors in rural health centers, and their feedback is very clear: having a solar system to benefit from energy access is helping them do their job and is also helping to create a bond between them and their patients, increasing health centers' role within the community. Lagazel is looking for more partners to spread out their locally-manufactured solutions in order to improve living conditions all across Africa.

Lagazel: Solidarity of Off-Grid Solar Solutions

Authors

Arnaud Chabanne

Lagazel, Saint Etienne, France

For lighting, families often use oil or battery-operated lamps which are dangerous to the health and expensive. Pupils have difficulty studying and economic activities are limited as soon as the sun sets, around 6pm throughout the year. Solar lamps offer the opportunity to access sustainable and affordable quality lighting.

Made in France & Africa

Discover the station :

Innovative Solutions: Lagazel's Collective Charging Station

Perfectly adapted to development projects, the collective charging station enables the simultaneous charging of 40 solar lamps. It is installed in a school; this allows pupils to study in the evening at home, thanks to a reliable light source.

This system is also a positive way of encouraging education: children must go back to school every day to continue to use their lamp.

Today, more than 16,000 people benefit from the station, within seven African countries.

Lagazel is the first company to manufacture solar lamps and solar home systems in Africa.

In Burkina Faso and Benin, about 20 locally trained technicians produce sustainable solar equipment, which passed Verasol's quality standards (formerly Lighting Global).

OUR PARTNERS :

- United Nations programs :
- Rural electrification agencies :
- NGOs & international solidarity associations :
- Local authorities & twinning commitees :
- Companies & foundations :

How to Get Involved with Us: Project References and Impact Figures

What Impact?

96% of parents notice a better assiduousness of their children.

98% of parents observe a decrease of their energetic spendings

68% of school directors say that students' results have improved*

*According to the Sunny Money report: "Un guide du modèle Luminothèque" 2014.

Project Examples:

Schools of the region of Koudougou Burkina Faso, 2021, 30,000 EUR

- 15 stations installed
- 1,200 children affected

The pros of the project:

- Installation of solar pumps for water access
- Connections between Burkinabe and French pupils: collective work on the creation of a guide about renewable energies
- Project leader: H2O Sans Frontières (French Association)

Cooperatives of the towns of Bugarama and Busoni Burundi, 2019, 126,000 EUR

- 120 stations installed
- 6,000 lamps distributed

The pros of the project:

- Lamp rental system managed by women cooperatives
- General funds for microcredit operations in order to develop local projects
- Project leader: UNPD Burundi

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The project completion in the school of Kierma has not only reduced educational inequality in energy access but also raised awareness on the possibility of giving a rechargeable lamp to every child and, indeed, increase school attendance.

-Boubacar Ouedraogo, Président of the Burkinable association Aide & Action du Bazéga

Schools of the Town of Aneho Togo, 2021, 80,000 EUR

- 40 stations installed
- 1,600 children affected

Project leader: Mai, Jeu, Tri (NGO)

The pros of the project:

Installation of waste recycle bins in schools

Sorted waste valuation system allowing the funding of new projects

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Global Health Governance and Health Equity in the Context of COVID-19: A Scoping Review

Wafa Abu El Kheir-Mataria, Sungsoo Chun, Hassan El Fawal, and Shahjahan Bhuiyan
American University In Cairo, Cairo, Egypt

Health equity is a moral obligation and an important aspect of responsible governance. The COVID-19 pandemic has exposed existing shortfalls of GHG through the exacerbation of already existing health inequities. Since the start of the pandemic, much literature has been produced discussing COVID-19 and health inequities. Given the ongoing health inequities during the COVID-19 crisis and the criticism of the current GHG, gathering the knowledge that covers this area and demonstrating the gaps in this knowledge is highly important. This scoping review aims at mapping the present knowledge and identifying these gaps.
The methodology used in this scoping review is based on guidelines for conducting systematic scoping reviews developed by the Joanna Briggs Institute. Five electronic databases were searched. Identified eligible studies were screened and reviewed by two reviewers. The screening was done through three stages: identification and elimination of duplicates, title and abstract screening, and full-text assessment. Data were charted in an excel table, and results were classified into conceptual categories. Analysis was done in three stages: open descriptive coding, focused thematic analysis, and finally, frequency, commonality, and significance analysis. Forty-nine studies met the inclusion criteria. Areas of research were: "Human rights and inequities", "Solidarity, collaboration and partnership", "GHG structure change", "Political and economic power and finance", "Approach to address inequity", "Law and regulations", and "Private investment and PPPs in GHG". The highest number of papers was on the "Human rights and inequities" theme. However, it appeared that the themes were interrelated, and articles touched on more than one theme. Moreover, the authors who contributed to research connecting GHG and health equity in the context of COVID-19 were mostly affiliated with developed countries. There is a need to increase collaboration in research, enhance information and knowledge sharing, and ameliorate research capacity in developing countries. Collaboration between disciplines in research concerning GHG and equity is also recommended. Quantitative evidence relating GHG to health inequities is solicited.

Global Health Governance and Health Equity in the Context of COVID-19: A Scoping Review

Authors

Wafa Abu El Kheir-Mataria[1], Hassan El Fawal[1], Shahjahan Bhuiyan[2], and Sungsoo Chun[1]

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Introduction

Health equity is an important aspect of responsible governance. COVID-19 exposed existing shortfalls of GHG through the exacerbation of already- existing health inequities across countries, as well as within the same country. Since the start of the pandemic, a considerable amount of literature has been produced discussing COVID-19 and health inequities. Gathering the knowledge covering these areas and demonstrating the gaps in this knowledge are of high importance to stimulate further research to better understand the status quo and for better future actions.

Aims

1. To map the body of literature on health equity in relation to GHG in the context of COVID-19.
2. To identifying research gaps according to research themes, discipline and countries of origin.

Methods

Methodology: Joanna Briggs Institute guidelines for conducting a systematic scoping review.

Identification of Studies

- Databases used for the search were PubMed, Scopus, Google Scholar, WorldCat and WHO's Global Index Medicus.

Search terms: “health inequity”, “health equity”, “Global Governance”, “COVID-19”.

Eligibility criteria

1. Written in English.
2. Published from the onset of COVID-19 in 2019 up until October 2021.
3. Main focus on global governance aspects which affect health equity.
4. Reports on health equity issues in the COVID-19 context.

Analysis

1. The analysis was carried out in three stages:
2. Open descriptive coding to generate ideas. These ideas were to be used in the thematic.
3. Focused thematic analysis to identify patterns and relationships.
4. Frequency, commonality and significance analysis of previously identified categories.

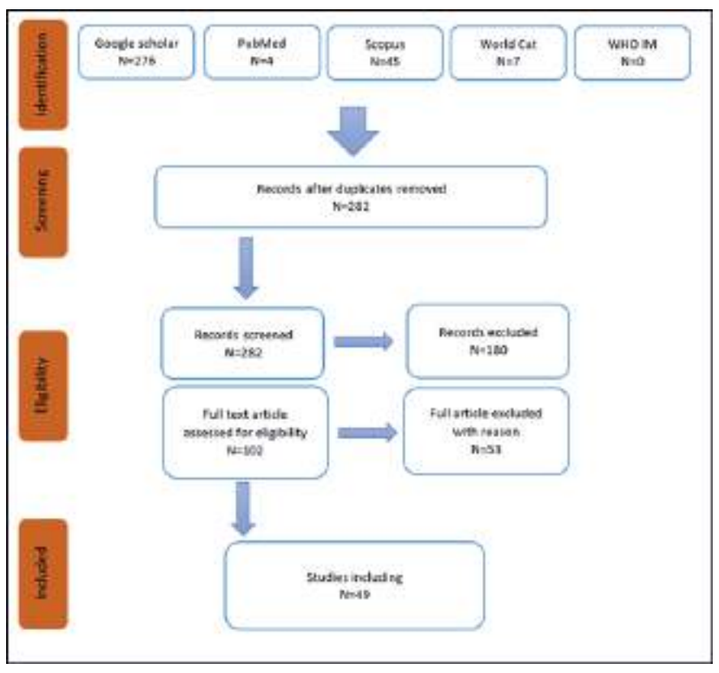


Figure 1. Search flow diagram.

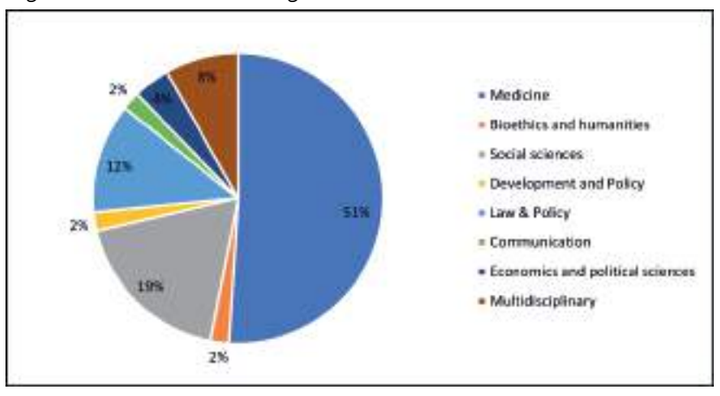


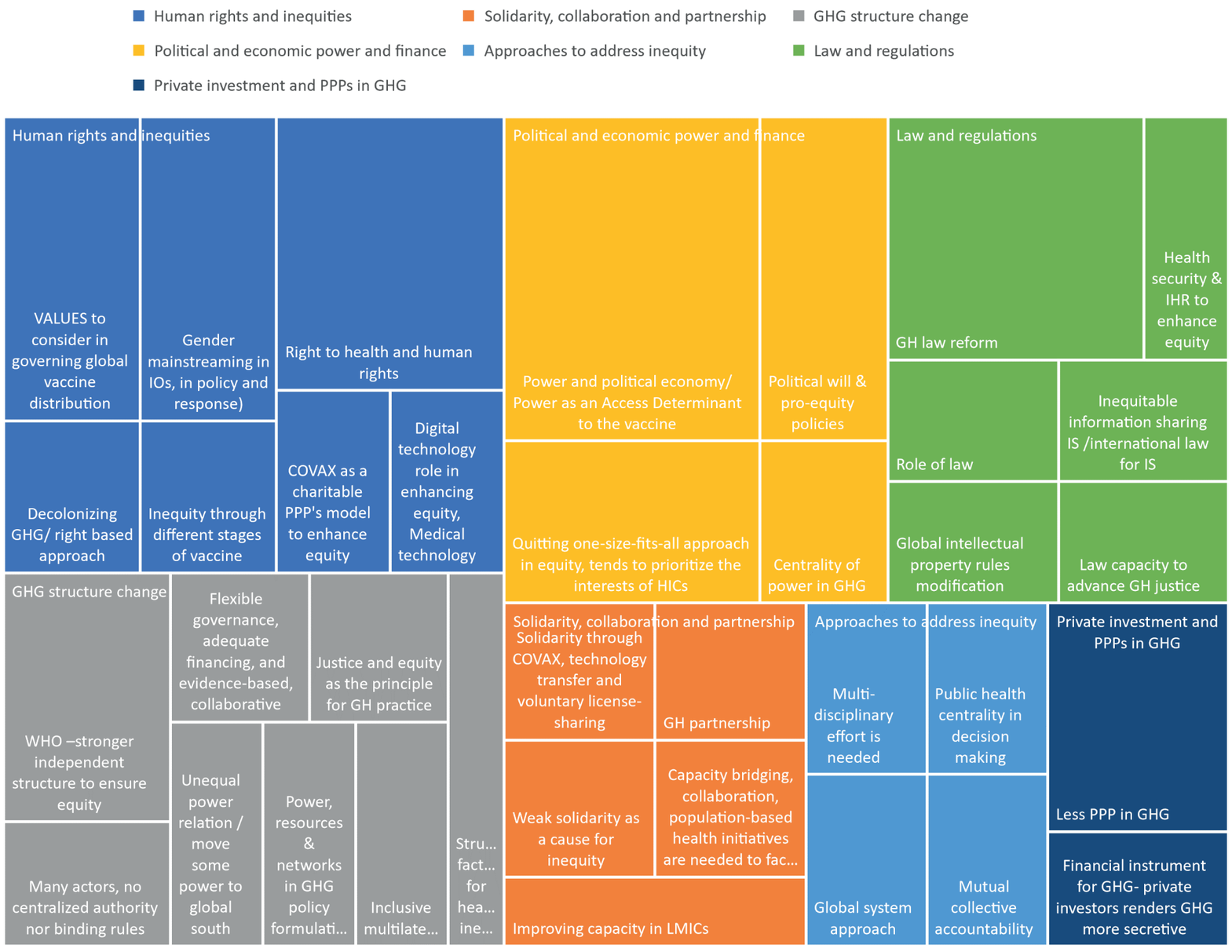
Figure 2. Studies per discipline.

Results Characteristics of Studies

- A total of 49 studies are included in this scoping review.
- Most studies are from the medical discipline.
- A total of 65.31% of the included studies were conducted by authors from a single country and 26.53% were conducted by authors from two or more countries.
- The country in which the highest number of studies was generated was the USA, followed by the UK

Identified Themes

Upon analyzing the different topics, the studies were grouped into seven main proposed themes according to the interconnected areas they covered.



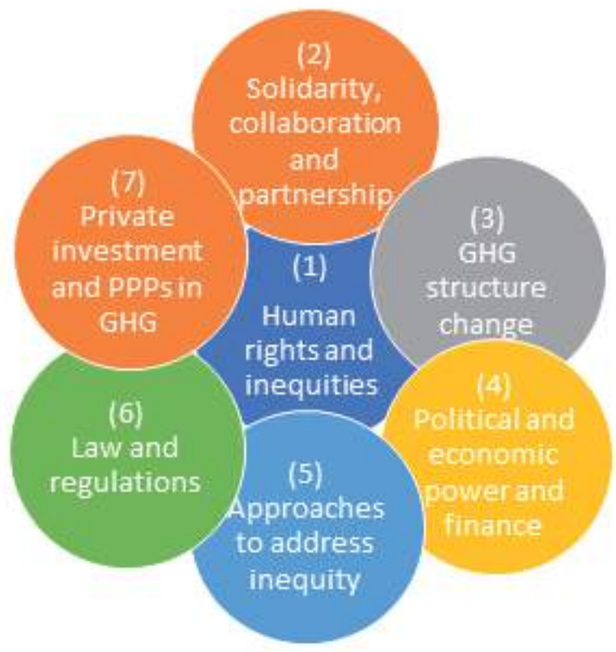


Figure 4. The interlinkages between themes discussing GHG, equity and COVID-19.

Discussion and Conclusions

- Although each study had a main theme, many of the articles touched upon other themes, showing several points of intersection between the themes.
- Researchers focused on the values underlying the GHG system and causes of health inequities (GHG structure, power imbalance, laws and regulations.
- Results indicated a gap in knowledge and expertise in developing countries. This entails the need for information sharing between countries, as well as capacity building in developing countries.
- Research concerning GHG and equity is multidimensional, which requires a wide range of expertise. There are few multidisciplinary studies in this domain, indicating the need for multidisciplinary collaborative research in this area.

Effects of Environmental Degradation in the Aral Sea Region of Uzbekistan on Human Health

Gulara Afandiyeva[1], Dominik Dietler[1], Otabek Eshmuradov[2], Astrid Knoblauch [1], Helen Prytherch[1], and Kaspar Wyss[1]

[1] Swiss Tropical And Public Health Institute, Allschwil, Switzerland;

[2] Ministry of Ecology, Uzbekistan

Over the past decades, the saline Aral Sea has declined to less than 10% of its original area due to changes in atmospheric circulation associated with global warming, hydrological changes, and excessive irrigation for cotton cultivation. The sinking water table has freed-up sediments loaded with toxic salts and minerals originating from extensive pesticide use. Winds from the dry lake distribute these substances across distances reaching up to several hundred kilometers, exposing humans to high levels of water, air, and soil pollution and food contamination. How and to what degree this environmental disaster affects human health in this region and beyond is still poorly documented. Findings from a literature review, epidemiological data, and information gained in key informant interviews with healthcare providers and focus group discussions with community members were triangulated to assess the documented and perceived health impacts of the environmental degradation in the Aral Sea region. Available evidence points to high exposure levels of the population to toxic substances, but the literature on health outcomes associated with these exposures is scarce and outdated. Key informants recognized increased rates of cerebrovascular, gastrointestinal, renal, respiratory diseases, neoplasms, and genetic disorders and highlighted the importance of climatic, environmental, and socio-economic determinants. In recent years, community members perceived an increase in non-communicable diseases, specifically cardiovascular diseases and cancers, which also noticeably increased in the younger generation. For them, these trends were linked to widespread air and water pollution, the high salt content of drinking water, and lifestyle habits. The climate was described to have changed towards hotter summers and colder winters, with more frequent drought episodes and more intense dust storms exacerbating the deposition of toxic chemicals from the Aral Sea. The combination of environmental degradation and economic and social challenges resulted in an increased burden of disease in the Aral Sea region. The Government of Uzbekistan, in collaboration with other countries in Central Asia, made substantial efforts to solve the Aral Sea conundrum and rehabilitate the affected region by restoring the delta and wetland areas, improving living conditions, and implementing a number of health sector reform projects.

Effects of Environmental Degradation in the Aral Sea Region of Uzbekistan on Human Health

Authors

Gulara Afandiyeva[1,2], Dominik Dietler[1,2], Otabek Eshmuradov[3], Astrid Knoblauch[1,2], Helen Prytherch[1,2], and Kaspar Wyss[1,2]

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[2] University of Basel, Switzerland
[3] Department on Radiation and Nuclear Safety, State Committee on Industrial Safety of the Republic of Uzbekistan

Introduction

Over the past decades, the saline Aral Sea has shrunk to less than 10% of its original area, due to changes in atmospheric circulation associated with global warming, hydrological changes and excessive irrigation for cotton cultivation. The sinking water table has freed up sediments loaded with toxic salts and minerals originating from extensive pesticide use. Winds from the dry lake distribute these substances across distances reaching up to several hundred kilometers, exposing humans to high levels of water, air and soil pollution and food contamination. How and to what extent this environmental disaster affects human health in this region and beyond is still poorly understood.

Figure 1. Focus group in Nurafshon (left) and key informant interview in Muynok (right), 2021.

Figure 2. Camel herd and beached boats in the Aral Sea, Muynak, May, 2021.

Methods

Findings from a literature review, epidemiological data and information gained from key informant interviews with health care providers and focus group discussions with community members were triangulated to assess the documented and perceived health impacts of environmental degradation in the Aral Sea region.

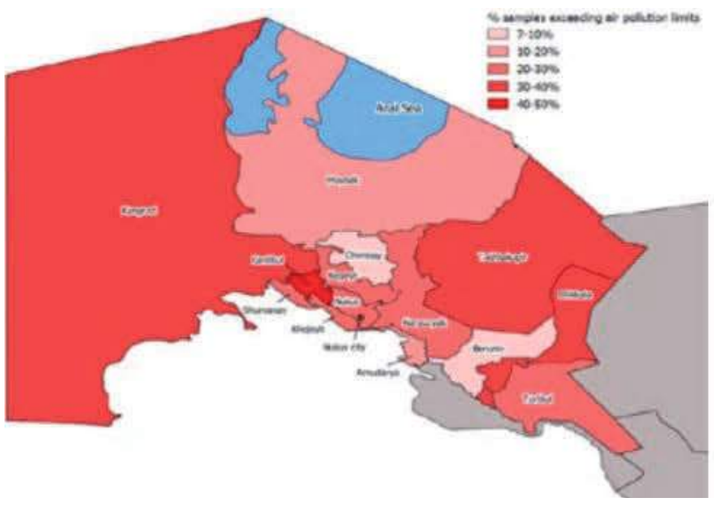

Figure 3. Map of the Republic of Karakalpakstan, showing the percentage of samples exceeding the national maximum permissible air pollution levels by district in 2019.

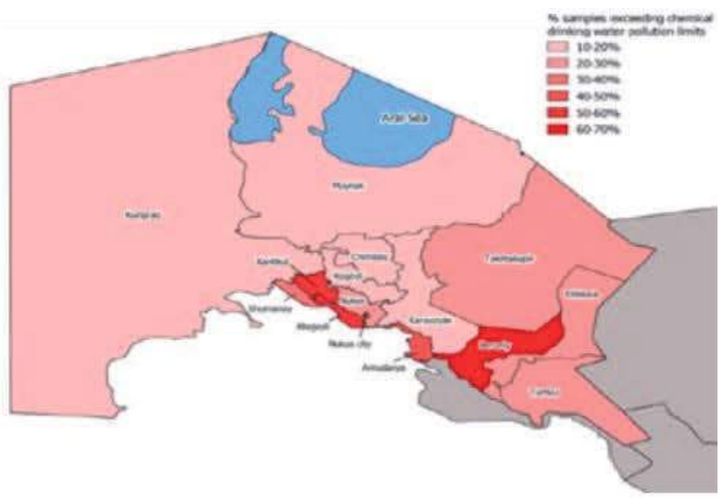

Figure 4. Map of the Republic of Karakalpakstan, showing the percentage of samples exceeding the national maximum permissible chemical drinking water levels by district in 2019.

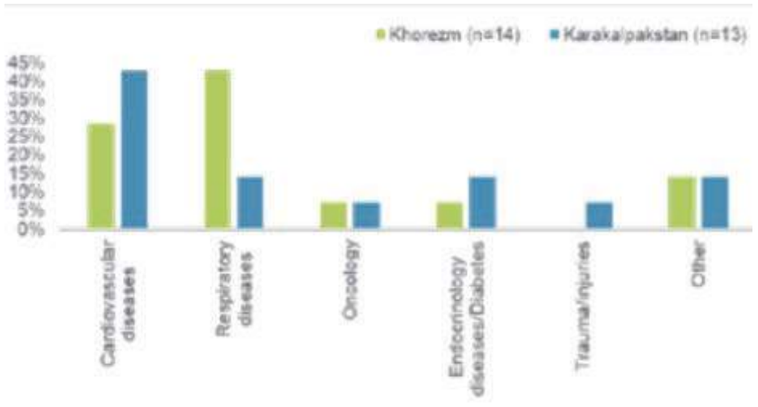

Figure 5. Most common discharge diagnosis where discharge diagnoses have been recorded.

Figure 6. Medical waste disposal in the Republic of Karakalpakstan.

Results and Discussion

Available evidence points to the population having high exposure levels to toxic salts and minerals, but the literature on health outcomes associated with these exposures is generally scarce and outdated. Key informants recognized increased rates of cerebrovascular, gastrointestinal, renal and respiratory diseases, neoplasms and genetic disorders, and highlighted the impacts of climatic, environmental and socio-economic determinants. Community members have perceived an increase in non-communicable diseases in recent years, specifically cardiovascular diseases and cancers, which were also more noticeable in the younger generation. For them, these trends were linked to widespread air and water pollution, the high salt content of drinking water and lifestyle habits. The climate was described as having changed towards hotter summers and colder winters, with more frequent drought episodes and more intense dust storms exacerbating the deposition of toxic chemicals from the Aral Sea.

Conclusions

The combination of environmental economic hardship and social challenges has resulted in an increased burden of disease in the Aral Sea region. The Government of Uzbekistan, in collaboration with the other countries in Central Asia, is making substantial efforts to solve the Aral Sea conundrum and rehabilitate the affected region by restoring the delta and the wetland areas, improving living conditions and implementing a number of health- sector-reform projects.

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Resilience of the Vaccine Supply Chain to COVID-19 in Côte d'Ivoire

Desquith Angele Aka, Calixte Guehi, Annita Hounsa-Alla, Marie Laure Tiade, and Julie Sackou-Kouakou
Département de Santé Publique, Hydrologie et Toxicologie, UFR des Sciences Pharmaceutiques et Biologiques, Université Félix Houphouët Boigny, Direction de Coordination du Programme Elargi de Vaccination de Côte d'Ivoire

The acquisition of new vaccines against COVID-19 required an urgent adaptation of storage capacity and cold chain logistics equipment. In Côte d'Ivoire, the population had long been reluctant to be vaccinated, adding to the challenge of adapting the logistics chain the risk of vaccine expiry. The aim of this study was to describe the capacity of vaccine logistics in Côte d'Ivoire to cope with COVID-19. The descriptive cross-sectional study covered the period from February to November 2021 in the logistics department of the Direction de Coordination du Programme Elargi de Vaccination (DCPEV). Data were collected on activities carried out in preparation for the response to COVID-19. These included national coordination, receipt and distribution of vaccines, and vaccine occupancy capacity in cold stores. National coordination reports on vaccine coverage and the logistics department report on input distribution were consulted. The Stock Management Tool software was used for data collection and analysis. Côte d'Ivoire received four types of vaccine (Astrazeneca®, Pfizer®, Sinopharm®, and Johnson and Johnson®) out of eight validated by the World Health Organization. The average number of inputs received was 97, compared with the usual annual average of 50. The frequency of distribution of COVID-19 vaccines was monthly, while that of routine vaccines was quarterly. Vaccine occupancy capacity in the central cold-storage rooms was 90% in 2021, twice the usual average. Out of 14,215,378 people expected to be vaccinated, 4,685,169 were vaccinated, i.e., 32.95% coverage. EPI vaccine logistics were able to cope with COVID-19 thanks to their reception, distribution, and storage capacity. We need to step up communication to encourage people to accept vaccination and avoid running out of the doses we receive.

Résilience de la Chaîne Logistique Vaccinale Face à la COVID-19 en Côte d'Ivoire

Authors

Desquith Angele Aka, Calixte Guehi, Annita Hounsa-Alla, Marie Laure Tiade, and Julie Sackou-Kouakou

Département de Santé Publique, Hydrologie et Toxicologie, UFR des Sciences Pharmaceutiques et Biologiques, Université Félix Houphouët Boigny, Direction de Coordination du Programme Elargi de Vaccination de Côte d'Ivoire

Introduction

L'acquisition de nouveaux vaccins contre la COVID-19 a demandé une adaptation d'urgence de la capacité de stockage. La population a longtemps hésité à se faire vacciner ; ajoutant au défi de l'adaptation de la chaîne logistique, celui du risque de la péremption des vaccins. L'objectif de cette étude était de decrire la capacité de la logistique vaccinale en Côte d'Ivoire à faire face à la COVID-19.

Etude

Etude transversale descriptive.

Lieu

Service logistique de la Direction de Coordination du Programme Elargi de Vaccination (DCPEV).

Collecte des Donnes

Les activités menées en vue de la riposte contre la COVID-19. Il s'agissait de la coordination nationale, de la réception et de la distribution des vaccins, de la capacité d'occupation des vaccins dans les chambres froides Les rapports de coordination nationale pour la couverture vaccinale et ceux des activités du service logistique sur la distribution des intrants ont été consultés. Le logiciel Stock Management Tool a servi d'outil de collecte et d'analyse des données.

Figure 1. Dépôt central DCPEV, Abidjan-Treichville.

Couverture Vaccinale: 33%

4 Types de Vaccines

Astrazeneca®, Pfizer®, Sinopharm®; Johnson & Johnson®

Reception

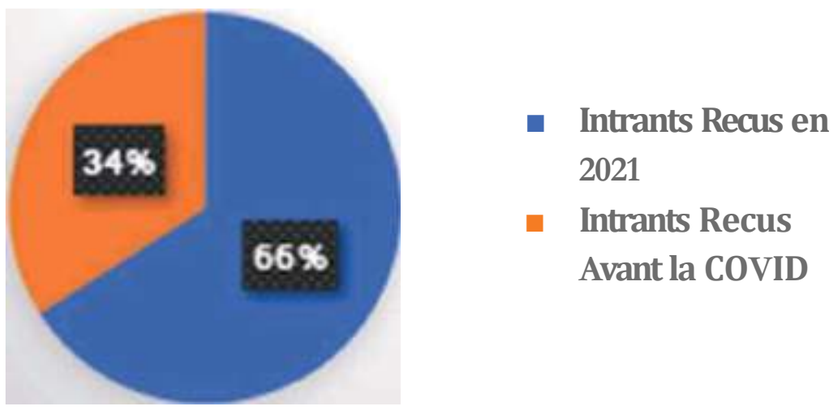

Figure 2. Proportion de la réception des vaccins contre la Covid-19 et de la routine.

Distribution

Frequence de distribution des vaccins de la Covid-19 était mensuelle alors que celle de la distribution des vaccins de routine était trimestrielle.

Figure 3. Camion servant à la distribution des vaccins.

Stockace

La capacité d'occupation des vaccins dans les chambres froides du dépôt central était de 90% en 2021, 2 fois supérieure à la moyenne habituelle.

Conclusion

La logistique vaccinale du PEV a pu faire face à la covid-19 à travers son système de réception, distribution et sa capacité de stockage. Il est nécessaire d'intensifier la communication en faveur de l'acceptation de la vaccination par les populations pour éviter les péremptions des doses reçues.

Are City Features Related to Obesity in Preschool Children? Evidence from Latin America

Jessica Hanae Zafra-Tanaka[1,2], Ariela Braverman[3], Cecilia Anza-Ramirez[1], Ana Ortigoza[3], Mariana Lazo[3], Tamara Doberti[4], Lorena Rodriguez-Osiac[4], Gina S. Lovasi[3], Monica Mazariegos[5], Olga Sarmiento[6], and J. Jaime Miranda[1,7]

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Urbanization shapes health through pathways involving cities' built and social environment features. Studies, mainly focused on high-income countries, have found links between these features and children and adolescents' obesity. Latin America (LA) is currently facing rapid urbanization and increases in childhood obesity. However, little is known about the burden of obesity in preschoolers and how cities could shape it. Thus, our study aimed to describe the prevalence of preschool children overweight/obesity across countries and cities in LA and to explore its association with city features. Cross-sectional analysis of 18,933 children aged 1-5 years who lived in 158 large cities in five countries in LA (Chile, Colombia, El Salvador, Mexico, and Peru) as part of the Salud Urbana en America Latina (SALURBAL) Project. We used individual-level anthropometric data from harmonized health surveys.

Overweight/obesity was defined as a z-score for weight-for-length/height>2, based on World Health Organization guidelines. We also characterized features of the social (living conditions, service provision, and educational attainment) and built environment (fragmentation, isolation, presence of mass transit, population density, intersection density, and percent greenness). We estimated the prevalence of childhood overweight/obesity in cities and used multi-level logistic models to explore associations between built and social, environmental features with overweight/obesity at the city and sub-city levels, adjusting for age, sex, and head of household education. The overall prevalence of overweight/obesity among pre-school children was 8% but varied substantially between and within countries. In the adjusted models, we found that lower odds of pre-school overweight/obesity in children were associated with higher distance between the urban patches-isolation- (OR:0.90, 95%CI:0.82-0.99) at the city-level and better educational attainment (OR:0.86, 95%CI:0.76-0.97) at the sub-city level. In contrast, higher odds were associated with better living conditions at the sub-city level (OR:1.15, 95%CI:1.00-1.31). In LA urban areas, we found substantial variability in the prevalence of childhood overweight/obesity between cities and countries. In the context of rapid urbanization in LA and other regions, our results suggest that features of the urban environment should be considered as key targets of policies to reduce childhood obesity.

Are City Features Related to Obesity in Preschool Children? Evidence from Latin America

Authors

Jessica Hanae Zafra-Tanaka[1,2], Ariela Braverman[3], Cecilia Anza-Ramirez[1], Ana Ortigoza[3], Mariana Lazo[3], Tamara Doberti[4], Lorena Rodriguez-Osiac[4], Gina S. Lovasi[3], Monica Mazariegos[5], Olga Sarmiento[6], and J. Jaime Miranda[1,7]

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All authors are part of the SALURBAL project (Salud Urbana en America Latina).

Key Messages

- Higher risk of preschool overweight/obesity (OW/OB) is associated with lower distance between urban patches, lower educational attainment and better living conditions in Latin American cities.
- The association between urban features and OW/OB in preschool children has implications for health over the life course.
- Local policies oriented to improve urban planning and living conditions should be considered as part of the strategies to reduce OW/OB at early stages in life.

Introduction

Urbanization shapes health through pathways involving cities' built and social environment features.

Latin America (LA) is currently facing rapid urbanization and increases in childhood obesity.

Little is known about how cities can contribute to the risk of childhood obesity, particularly at early stages of life.

Objectives

- To describe the prevalence of preschool children OW/OB across countries and cities in Latin America.
- To examine associations between features of the urban built and social environment and preschool OW/OB prevalence.

Methods

Study design and sample: Cross-sectional analysis of 18,933 children aged 1-5 years who lived in 519 sub-cities of 158 cities with 100,000 or more residents in 5 countries in LA (Chile, Colombia, El Salvador, Mexico, and Peru).

Outcome: Overweight/obesity (a z-score for weight- for-length/height>2)

Exposure: city features of the social (living conditions, service provision and educational attainment) and built environment (fragmentation, isolation, presence of mass transit, population density, intersection density and percent greenness).

Statistical approach: multilevel logistic regression examining associations between built and social environmental features and OW/OB at the city and sub-city levels, adjusting for individual-level characteristics (age, sex, and head of household education).

Results

Prevalence of preschool overweight/obesity varied substantially between and within countries

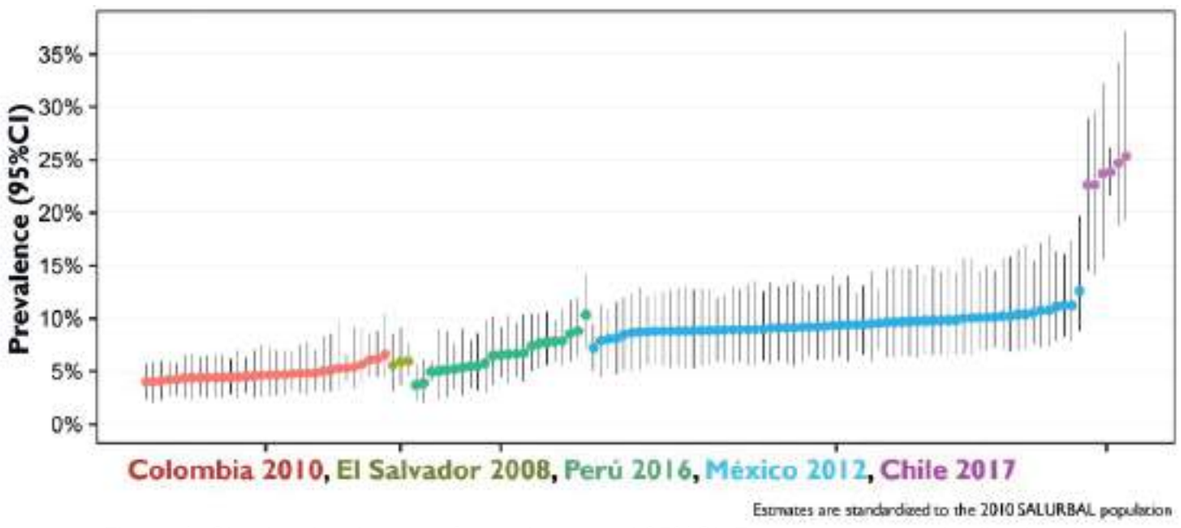

Figure 1. City-level estimates of prevalence and 95%CI. Estmates are standardized to the 2010 SALURBAL population.

Lower odds of OW/OB were associated with:

- higher distance between the urban patches isolation at the city-level.
- better educational attainment at the sub-city level.

Higher odds of OW/OB were associated with better living conditions at the sub-city level.

Table 1. Association between the built and social environment with preschool OW/ OB in I58 Latin American cities.

	Contrast (SD)	OR (95%CI)
City level variables		
Fragmentation [Patch density (n/100ha)]	0.28	1.09 (0.94, 1.26)
Isolation [mean distance [m] to the nearest urban patch]	39.67	0.90 (0.82, 0.99)
Mass transit presence	No	1.05 (0.77, 1.43)
Sub-city level variables		
Built environment		
Population density [n/km2]	5238.42	0.99 (0.88, 1.11)
Intersection density [n/km2]	46.52	1.07 (0.97, 1.19)
Percent of greenness [%]	35.53	0.99 (0.88, 1.12)
Social environment		
Living conditions score	1.76	1.15 (1.00, 1.31)
Service provision score	1.39	0.91 (0.81, 1.01)
Education attainment score	1.73	0.86 (0.76, 0.97)

Model adjusted for individual variables: age in months, sex, and head of household education, and country fixed effects.

LAC-URBAN HEALTH
Urban Health Network for Latin America and the Caribbean

SALURBAL
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Effectiveness of Pharmaceutical and Non-Pharmaceutical Interventions Against Airborne Transmission: Computational Modeling Using CARA

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The COVID-19 pandemic has highlighted the need for a proper risk assessment of respiratory pathogens in indoor settings. We aimed to develop a COVID Airborne Risk Assessment (CARA) tool, to assess the potential exposure of airborne SARS-CoV-2 viruses in indoor settings. The tool enables decision-makers to assess the risk of exposure to the virus, comparing several pharmaceutical and non-pharmaceutical interventions. The CARA model exhibits five main aspects: 1) the emission rate of viruses coming from the infected host(s), which is a result of the respiratory activity combined with the possible use of masks; 2) the viral removal rate resulting from ventilation or air filtration, viability decay, and settlement; 3) the viral concentration profile over time resulting from the balance of the two previous quantities; 4) the accumulated viral dose absorbed by an exposed host, deposited in the respiratory tract; and 5) the probability of infection (transmission) resulting from such a dose, including epidemiological, virological, and immunological parameters. The use of masks provides a five-fold reduction in emissions. Many settings rely on natural ventilation strategies, which are very effective in decreasing the concentration of virions, and in combination with masks, yield up to a 12-fold decrease in cumulative dose. Vaccination is an effective measure against hospitalization; however, its effectiveness against transmission is not optimal; hence, non-pharmaceutical interventions (ventilation, filtration, masks) should be actively supported. Vaccine effectiveness will also be limited by the emergence of new variants, whereas non-pharmaceutical interventions are effective independently of the variant. Therefore, measures that reduce the viral density in the air should be actively supported and included early in the risk-assessment process. Vaccination and host immunity are very important protective measures; however, non-pharmaceutical interventions seem to be more effective in preventing transmission. CARA allows for such a quick and accurate assessment of various indoor settings to assess the effectiveness of several (combined) measures. In a post-COVID era, we will face a new paradigm with the inclusion of this novel occupational hazard, using tools such as CARA to endorse healthy buildings and protect their occupants against respiratory infections.

Effectiveness of Pharmaceutical and Non-Pharmaceutical Interventions Against Airborne Transmission: Computational Modeling using CARA

Authors

Luis Aleixo[1,2], Andre Henriques[1], Gabriella Azzopardi[1], James Devine[1], Julian Tang[3], Marco Andreini[1], Markus Rognlien[4], Nicola Tarocco[1], Nicolas Mounet[1], Olivia Keiser[5], and Philip Elson[1]

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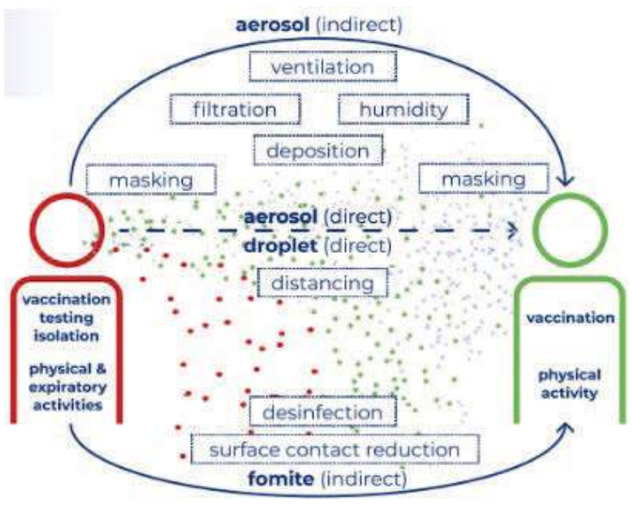


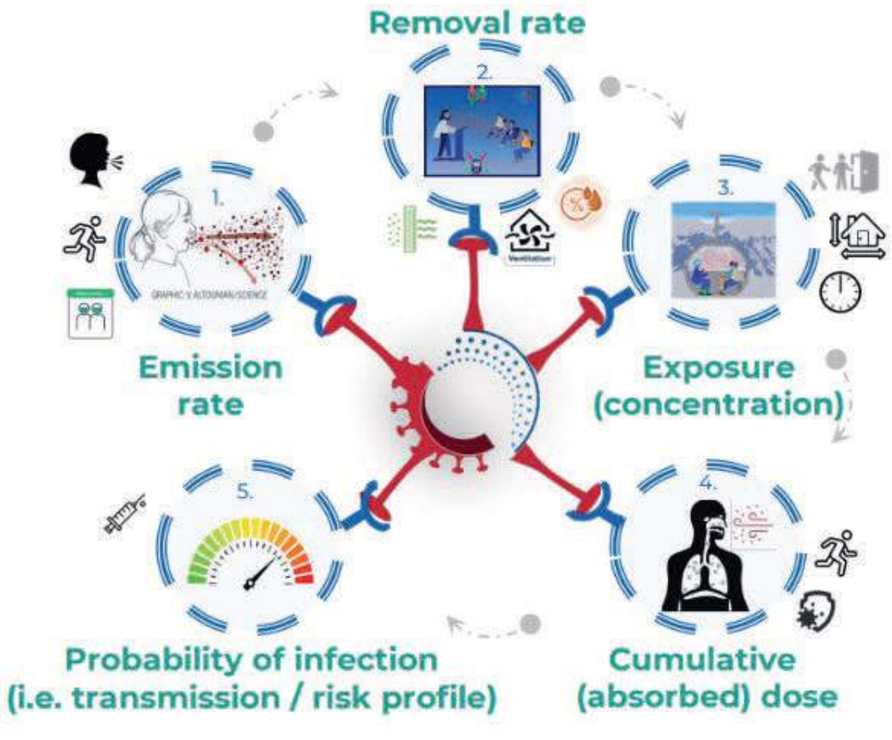
Airborne Transmission of SARS-CoV-2

- Of the common modes of viral transmission, the airborne route seems to have significance and is recognized to be the main spreading mechanism of COVID-19 infections worldwide[1].
- Public health measures indicate the importance of proper building and environmental engineering control measures, such as indoor air quality.
- Proper guidance for building engineers or facility managers on how to prevent airborne transmission is essential.

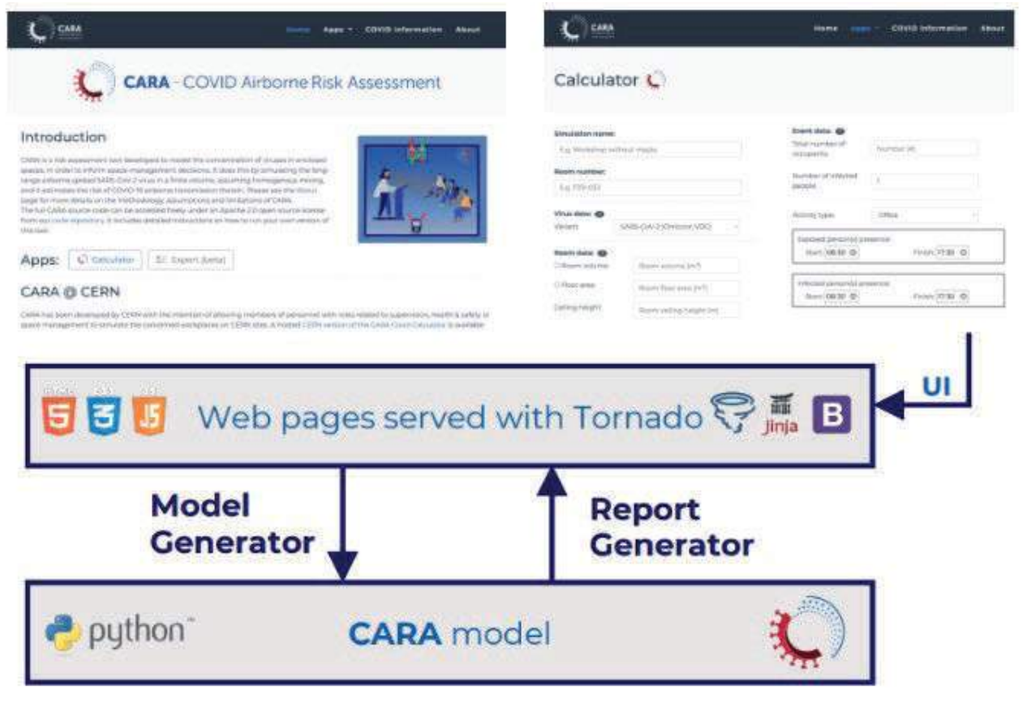
What is CARA?

- CARA stands for COVID Airborne Risk Assessment, and was developed by CERN. It aims to manage and quantify the risk of airborne spread of viruses in enclosed spaces.
- The model simulates the direct and indirect airborne spread of the SARS-CoV-2 virus in a given setting, estimating the risk of the airborne transmission of COVID-19.
- CARA is freely available as open source software[2].
- It is currently used by International Organizations, universities, schools and individuals in households.
- The CARA model was published in a peer-reviewed journal [3].

Methodology (Five-Tier Process)

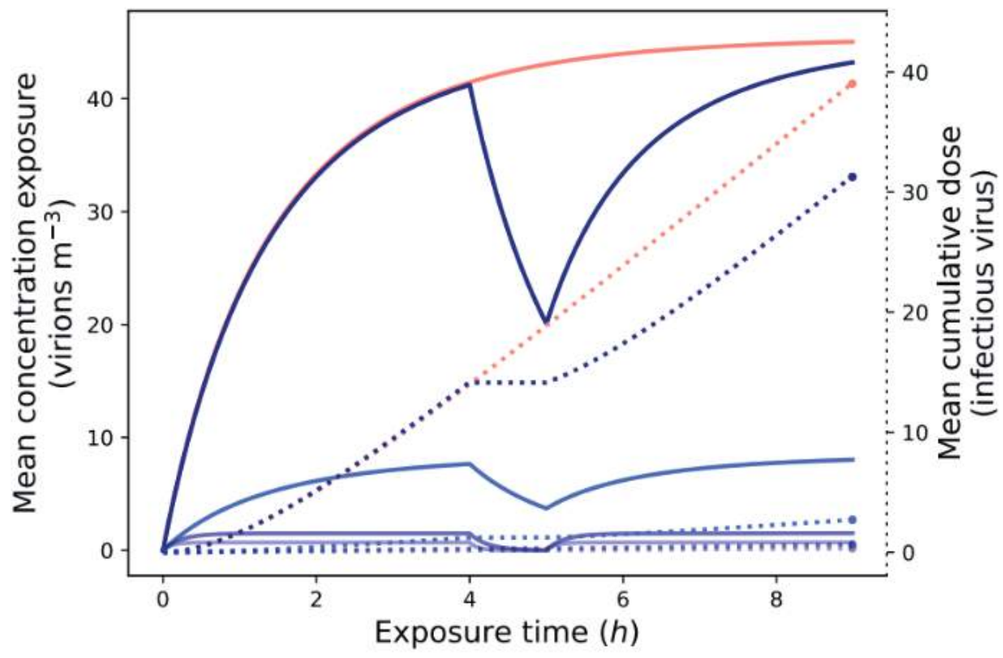


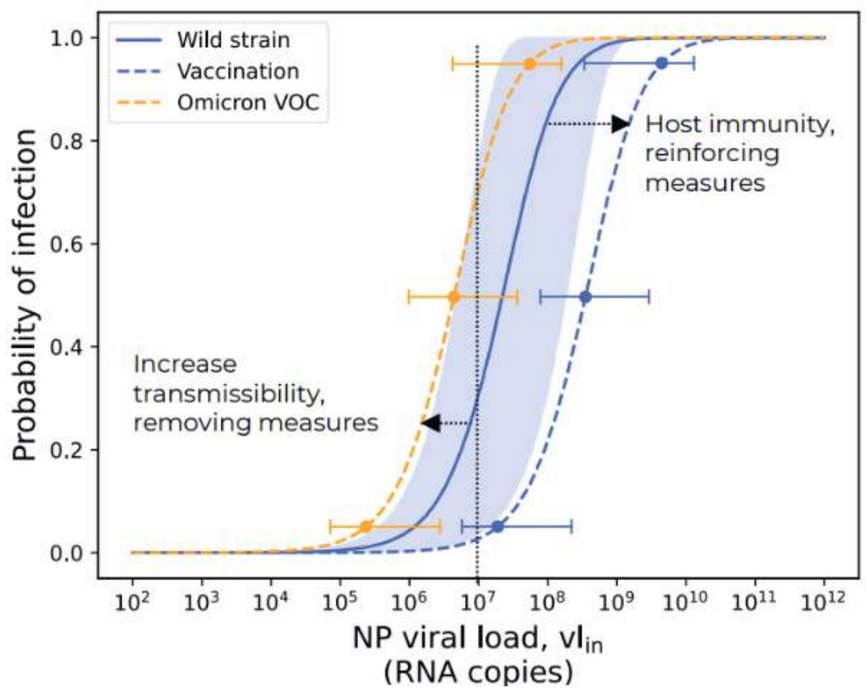
Architecture and Technology

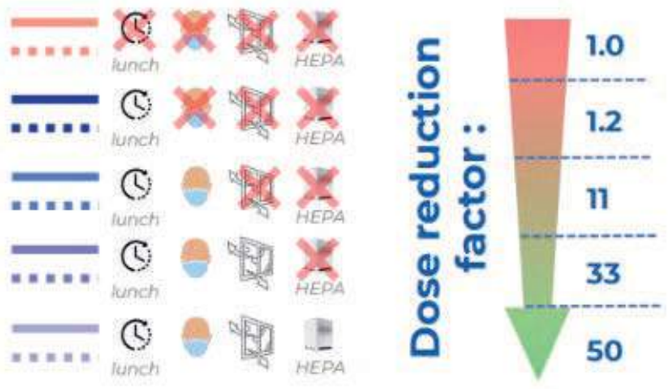


Efficiency of Pharmaceutical and Non-Pharmaceutical Interventions

Baseline scenario: Regular working day, room volume of 160 m3, winter season (cold and dry), 20 occupants, 1 is infected.







Viral loads range: 7 orders of magnitude. The aim is to ensure, even for the most contagious host (e.g., > 107 copies mL-1), a low probability of secondary on- site transmission (i.e., shift the curve to the right) [3].

References

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HSE Occupational Health & Safety and Environmental Protection Unit

CARA COVID Airborne Risk Assessment

Remote Data Collection: Reducing Carbon Emissions by Minimising International Fieldwork Travel

Melvine Anyango[1] and Jennifer Cole[2]
[1] Department of Environmental Health, School of Environmental Studies, University of Eldoret,
[2] Department of Health Studies, School of Life Sciences and the Environment, Royal Holloway, University of London, UK

The COVID-19 pandemic has presented challenges for international research projects, preventing cross-border and in-country research fieldwork. This has fast-tracked digital teaching and remote working. The advantages of this should endure beyond the current crisis. The pandemic has proven that academics in one country can direct and instruct colleagues in another to collect data at a local level without the need for international travel and without compromising the quality of the research. Importantly, lessons identified from these experiences can ensure that international research can be carried out without incurring the high carbon footprint of international travel. To give an example of this, a food and nutrition project funded by the Grand Challenges Research Fund (GCRF) Internal QR Urgency Awards (Royal Holloway) was conducted without any international travel. Young researchers from the University of Eldoret were trained remotely in data collection, safeguarding, and medical ethics and were able to successfully complete the data collection required. The project avoided generating 26.39 tonnes of CO2 from the return flights from eight people to Kenya that had been factored into the project plan pre-COVID-19 travel. Hence, remote working should continue to be utilized where possible, even after international travel opens up again post-pandemic.

Remote Data Collection: Reducing Carbon Emissions by Minimising International Fieldwork Travel

Authors

Melvine Anyango[1] and Jennifer Cole[2]

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Abstract

The COVID-19 pandemic has presented challenges for international research projects, preventing cross-border and in-country research fieldwork. This has fast-tracked digital teaching and remote working. The advantages of this should endure beyond the current crisis. The pandemic has proved that academics in one country can direct and instruct colleagues in another to collect data at a local level without the need for international travel and without compromising the quality of the research. Importantly, lessons identified from these experiences can ensure that international research can be carried out without incurring the high carbon footprint that comes with international travel.

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Overview

The project addresses the role of wet markets in child nutrition. Child malnutrition is highly prevalent in Kenya. About 26% of children under five in Kenya have stunted growth (DHS, 2014). Childhood malnutrition is associated with poor health and education in later life. It is also linked, at the societal level, with high poverty and low economic growth (McGovern et al., 2017). Hence, the study project assessed households and collected qualitative and quantitative data in Eldoret, Uasin Gishu, County, Kenya.

Figure 1. Research Assistants (UoE) engaging the community.

Meanwhile, in-country researchers (University of Eldoret) were remotely trained to map the markets (QGIS), conduct the Household Demographic Survey, carry out the Dietary Assessment, and conduct the Child Health Assessment.

Figure 2. Research Assistants (UoE) collecting data.

Data were collected from selected households with children under five years old in peri-urban communities in Eldoret, Uasin, Gishu County, to evaluate household food consumption and child health via sources of childhood protein (eg. eggs, milk, poultry meat, pork, beef, goat, and lamb) and producers and suppliers.

Figure 3. Animal protein sources (poultry, cattle and pigs).

The remote data collection process was designed to minimize face-to-face contact between data collectors and study participants in-country in line with WHO/national COVID-19 health protocols. An added advantage was the reduction in carbon emissions due to restrictions on international researchers' fieldwork travel without compromising data quality.

Figure 4. Child height measurement and haemoglobin test.

Thereafter, qualitative and quantitative data were generated and the data are presently being analysed to make informed scientific conclusions that will address sound environmental and health policy interventions concomitantly.

Figure 5: In-country research team (UoE).

BioRodDis: A Transdisciplinary Eco-health Project to Evaluate the Relationship between Micromammal Biodiversity and Zoonoses Risks in Europe

I. Arpin[1], C. Massart[1], V. Bourret[2], G. Castel[1], V.C. Colombo[3], J. Eccard[4], J. Firozpoor[4], M. Grzybek[5], H. Henttonen[2], H. Leirs[3], A. McManus[6], B. Roche[7], T. Sironen[2], V. Sluydts[3], P. Stuart[6], A. Zintl[8], and N. Charbonnel[1]

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How does biological diversity alteration lead to the emergence of zoonotic diseases? This question has received a lot of attention because of the concomitant occurrence of habitat alteration, biodiversity loss, as well as pathogen transmission and emergence from wildlife. However, the scientific community is struggling to precisely understand how biodiversity affects disease emergence. The Biodiversa Bioroddis project (2020-2024) aims at elucidating these interlinkages between biodiversity and diseases at local and European scales using standardized assessments of biodiversity and disease risks. We tackle this complex question by focusing on rodent-borne diseases, as rodents have long been recognized as important reservoirs of infectious agents with a high transmission potential for humans and domestic animals. We focus on forests and urban parks as environments where rodents are abundant, human/domestic wildlife interactions occur, and efforts are undertaken to preserve biodiversity. The main objective of Bioroddis is to establish science–policy interfaces enabling the design of win–win strategies (prevention, ecosystem management, and practice implementation) in support of nature–health benefits. Due to the complexity of this health and environmental issue, a multi-disciplinary approach and a close dialogue between disciplines (inter-disciplinarity) have been implemented to improve the understanding and management of these zoonoses. A transdisciplinarity approach is also at the heart of Bioroddis, through the definition of a common conceptual eco-health framework, based on shared theories, concepts, and approaches. Two years on from the beginning of the project, we are evaluating the capacity of Bioroddis to achieve transdisciplinarity. The results of this evaluation, based on a semi-quantitative method, are presented in this poster.

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Our Objectives

To improve the understanding and management of rodent-borne zoonoses in forests and urban parks, from biological and socio-environmental points of view;

To implement a multi-disciplinary approach and a close dialogue between disciplines (inter- disciplinarity);

To develop transdisciplinarity through the definition of a common conceptual EcoHealth framework;

Two years into the BioRodDis project, to evaluate its capacity to achieve transdisciplinarity.

The State of the Art

How does biological diversity alteration lead to the emergence of zoonotic diseases? This question

has received a lot of attention, because of the concomitant occurrence of habitat alteration and biodiversity loss, as well as pathogen transmission and emergence from wildlife.

However, the scientific community is struggling to understand exactly how biodiversity affects disease emergence.

A transdisciplinary EcoHealth approach is required to address this problem.

The Biodiversa-BioRodDis project (2020-2023) aims to elucidate the interlinkages between biodiversity and diseases at local and European scales. We focus on rodent-borne diseases, as rodents are important reservoirs of infectious agents, with a high transmission potential for humans and domestic animals. We consider forests and urban parks to be environments where rodents are abundant, human/domestic wildlife interactions occur, and efforts are undertaken to preserve biodiversity.

Findings

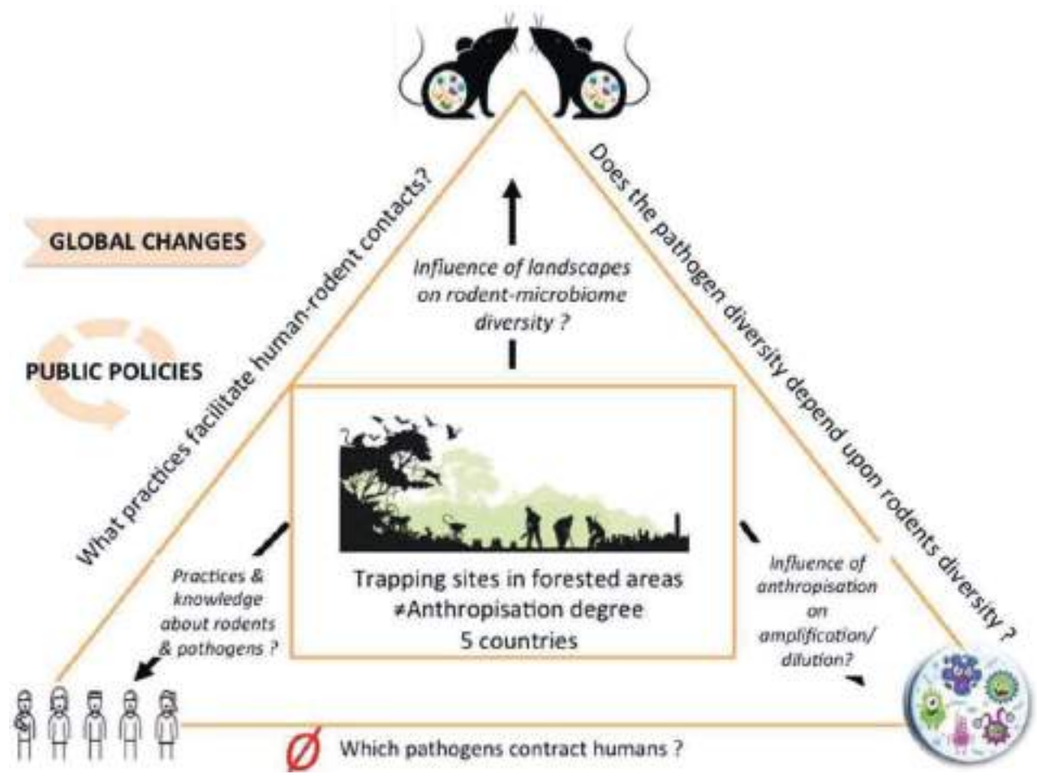
Definition of a common EcoHealth framework based on shared theories, concepts and approaches:

What relationships between living beings favour the circulation and transmission of rodent-borne pathogens?

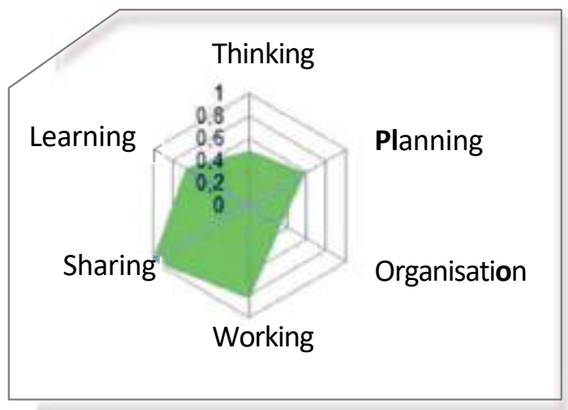
High scores for all aspects related to the description of the system, the division of tasks within the team and the sharing of data and methods.

Low scores for all criteria related to the involvement of societal actors in all phases of the project cycle.

BioRodDis Framework

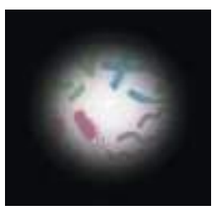


Semi-Quantitative Evaluation of Inter- and Transdisciplinarity



A consulting rather than participatory transdisciplinary project.

Methods



Disciplines gathered:

-Ecology;

-Virology,

-Microbiology

-Sociology.

Interviews of project members:

Meetings

Identification and Interviews of Stakeholders

1- Users and managers of the sites surveyed and general practitioners operating in the vicinity of the sites.

2- Stakeholders from the conservation, veterinary, human health and public health sectors, interested in rodents and their pathogens at the national or European level.

Conclusion

While working on rodent-borne diseases, a relatively weak harmful problem in Europe, the COVID-19 crisis, a super harmful problem, affected the transdisciplinarity of the project.

1- It undermined our capacity to involve many societal actors that we had planned to involve.

2- It allowed for productive discussions with some local societal actors about issues that would probably not have been addressed in the case of super harmful problems.

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Improving Access to PMTCT through the Involvement of Traditional Birth Attendants in Program Activities in the Lake Chad Basin Area of Cameroon: A Retrospective Cohort Study

Jerome Ateudjieu[1,2,3], Ketina Hirma Tchio-Nighie[1], Anthony Njimbia Chebe[1], and Charlette Nangue[1]
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[2] Department of Public Health, Faculty of Medecine and Pharmaceutical Sciences, University of Dschang
[3] Cameroon Ministry of Public Health

Maternal and child mortality is higher in the Cameroon part of the Lake Chad basin compared to the rest of the country because of limited access to recommended care during pregnancy and delivery. The majority of deliveries in these settings are assisted by traditional birth attendants (TBA). This project was conducted to assess whether training and involving TBA in community-based PMTCT interventions can contribute to improving targeted population access to these interventions. In targeted communities, TBA were trained in identifying and referring pregnant women from the community to health facilities for antenatal care and in organizing community sessions to deliver PMTCT interventions to the targeted population. After the implementation of the intervention, an endline survey was conducted targeting mothers of children aged 0-24 months in communities exposed to the intervention and in neighboring communities randomly selected to collect data on access to antenatal care, HIV testing, and resulting care. The effect of the intervention was assessed by comparing the coverage of antenatal care, recommended HIV testing, and test results withdrawal by using appropriate tests. In total, 293 mothers–children couples were included from communities that benefited from the intervention (exposed) and 288 from those that did not benefit (non-exposed). Exposed mother–child couples had significantly higher reported and documented access to mother antenatal HIV testing compared to the couples living in non-exposed communities with adjusted relative risk (ARR) of 1.6 (1.2-2.0) and 3.5 (2.4-5.1), respectively. The mean number of antenatal consultations was not significantly higher in the exposed group [regression coefficient ®=0.18 (-0.18-0.55), p-value (p)=0.327)], whereas the mean number of HIV tests received by the mothers in the exposed communities during the antenatal life of children was significantly higher [R=1.12 (0.93-1.32), p=0.00)]. The proportion of mothers who withdrew their HIV test results in the exposed group was significantly higher compared to the proportion in the non-exposed group (Chi-square test= 4.77, p=0.029). The training and involvement of TBA in delivering PMTCT interventions at the community level can improve population access to these interventions. The consistency of these findings should be tested in other communities in need and with other healthcare interventions.

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Introduction

Maternal and child mortality is higher in the Cameroon part of the Lake Chad basin compared to the rest of the country. This is mainly due to limited access to recommended care during pregnancy and delivery. The majority of deliveries in these settings are assisted by traditional birth attendants (TBA). This project was conducted to assess whether training and involving TBA in community-based PMTCT interventions can contribute to improving the targeted population's access to these interventions.

Methods

In targeted communities, TBA were trained in identifying and referring pregnant women from community to health facilities for antenatal care and in organizing community sessions to deliver PMTCT interventions. After the implementation of the intervention, an end line survey was conducted targeting mothers of children aged 0-24 months in communities exposed to the intervention and in neighboring communities randomly selected to collect data on access to antenatal care, on HIV testing and resulting care. The effect of the intervention was assessed by comparing the coverage of antenatal care, recommended HIV testing and test results withdrawal by using appropriate tests.

Results

In total, 293 mother–children pairs were included from communities that benefited from the intervention (exposed) and 288 from those that did not benefit (non-exposed). Exposed mother–child pairs had significantly higher reported and documented access to mothers' antenatal HIV testing compared to the pairs living in non-exposed communities, with adjusted relative risk (ARR) values of 1.6 (1.2-2.0) and 3.5 (2.4-5.1), respectively.

The mean number of antenatal consultations was not significantly higher in the exposed group [regression coefficient (R)=0.18 (-0.18-0.55), p value (p)=0.327)], whereas the mean number of HIV tests received by the mothers in the exposed communities during the antenatal life of children was significantly higher [R=1.12 (0.93-1.32), p=0.00)]. The proportion of mothers who withdrew their HIV test results in the exposed group was significantly higher compared to the proportion in the non-exposed group (Chi square test= 4.77, p=0.029).

Conclusion

The training and involvement of TBA in delivering PMTCT interventions at a community level can improve population access to these interventions. The consistency of these findings should be tested in other communities in need and alongside other healthcare interventions.

Impact of Housing Water and Sanitation (WATSAN) Facilities on Health: Evidence from Pakistan

Zara Bari[1] and Imran Bari[2]
[1] Semiotics Consultants (Pvt.) Ltd., Islamabad, Pakistan
[2] George Washington University, Washington DC, United States

One of the major factors in health degradation is the housing environment, including housing building materials, water sources, sanitation facilities, waste disposal, and indoor air pollution. Health varies with different socioeconomic, demographic, and environmental characteristics. The study analyzed the association of various socioeconomic and housing environmental factors on health. Using the data from the nationally representative survey, the Pakistan Panel Household survey, a detailed analysis was done on the effects of housing water and sanitation (WATSAN) facilities on the health of individuals through bivariate and multivariate analysis (logistic regression). The association was measured through three indicators: total population reported ill; population reported ill with selected water-borne diseases (infectious intestinal problems and jaundice); children reported sick with diarrhea. The result showed that different socioeconomic factors had a very strong association with the health of the individuals. Another objective was to measure the effects of WATSAN facilities on health. The logistic regression showed that the probability of falling ill slightly increased in individuals living in households having no piped water source and no drainage system. The population reported ill with water-borne diseases and diarrhea showed a significant association for bivariate and multivariate analysis. The likelihood of falling ill with these diseases increases significantly in houses lacking the proper toilet facility and covered drainage system. As for the unsafe source of drinking water, it showed no relation in increasing the likelihood of falling ill with diarrhea and other selected water-borne diseases. Pakistan's socioeconomic and demographic factors strongly affect health; water-borne diseases, including diarrhea in children, were found to have a significant association with housing sanitation facilities, whereas a weak association of these diseases was found with the source of drinking water.

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Introduction

One of the major factors contributing to health degradation is housing environment, which includes housing materials, household water sources, household sanitation, household waste disposal and indoor air pollution. This study analysed the association of various socioeconomic and housing environmental factors on health.

Methodology

Data sourced for analyses in this study were taken from the Pakistan Panel Household Survey, 2010. A detailed analysis was carried out on the effects of housing Water and Sanitation (WATSAN) facilities on the health of individuals using logistic regression.

The association was measured through three indicators: total population reported ill; population reported ill with selected water-borne diseases (infectious intestinal problems and jaundice); and children reported sick with diarrhea.

Results

Logistic Regression Analysis of Population reported lll with Water borne Diseases

Variable	Category	Coefficients	Odds Ratio
Source of Drinking Water			
	Piped/Motor PumpRc	-	-
	Others	-.131	.877
Toilet Facility*			
	Flush SystemRc	-	-
	Others	.087	1.091
Drainage System*			
	Covered Drain SystemRc	-	-
	Open Drain System	.263	1.769
	No System	.067	1.070
***Significant at 5%, **Significant at 10%**			
RC Stands for Reference Category			
Percentage Predicting Correctly	**70%**		

Logistic Regression Analysis of Children reported lll with Diarrhea

Variable	Category	Coefficients	Odds Ratio
Source of Drinking Water			
	Piped/Motor PumpRc	-	-
	Others	-.126	.881
Toilet Facility*			
	Flush SystemRc	-	-
	Others	.180	1.197
Drainage System*			
	Covered Drain SystemRc	-	-
	Open Drain System	.460*	1.584
	No System	.009	1.991
***Significant at 5%, **Significant at 10%**			
RC Stands for Reference Category			
Percentage Predicting Correctly	**71%**		

Logistic Regression Analysis of Population reported III

Variable	Category	Coefficients	Odds Ratio
Age Groups*			
	0-6Rc	-	-
	7-14	-.073	.930
	15-29	.209	1.232
	60+	-.100	.905
Sex			
	MaleRc	-	-
	Female	.014	1.986
Type of Residence*			
	UrbanRc	-	-
	Rural	.175*	1.839
Province*			
	PunjabRc	-	-
	Sindh	.454*	1.574
	KP	.570*	1.769
	Baluchistan	.270*	1.310
Education of Head of the Household*			
	IlliterateRc	-	-
	Primary	-.197*	.821
	Secondary & Matric	-.132*	.877
	College & Higher	-.250*	.779
Working Status*			
	WorkingRc	-	-
	Nonworking	.476*	1.610
Annual Household Income*			
	<=10,000Rc	-	-
	10,001-30,000	-.0320*	.726
	30,001-50,000	-.174	.840
	50,001-100,000	-.249*	.779
	100,001+	-.158	.854
Source of Drinking			
	Water Piped/Motor PumpRc	-	-
	Others	.031	1.032
Toilet Facility*			
	Flush SystemRc	-	-
	Others	-.288*	.750
Drainage System*			
	Covered Drain SystemRc	-	-
	Open Drain System	.223*	1.250
	No System	.624*	1.866
***Significant at 5%, **Significant at 10%**			
RC Stands for Reference Category			
Percentage Predicting Correctly	**70.5%**		

- The probability of falling ill slightly increased in individuals living in households having no piped water source and no drainage system.
- The likelihood of falling ill with water borne diseases and diarrhea increased significantly in lacking the proper toilet facility and covered drainage systems.
- An unsafe source of drinking water showed no relation in increasing the likelihood of falling ill with diarrhea and other selected water-borne diseases.

Conclusions

- The analysis shows that water-borne diseases and diarrhea have a more significant association with sanitation facilities than with the source of drinking water. This could be due to personal hygiene (tap to mouth route) not being taken into account.
- The results showed that socioeconomic and demographic factors had a very strong association with the health of the individuals, measured through the total ill population and the population reported ill with water-borne diseases and diarrhea.

Strengthening the Supply and Demand for Nutritious, Local, and Agro-Ecologically-Produced Foods in Secondary Cities in Bangladesh, Kenya, and Rwanda

Tanja Barth-Jaeggi[1], Cornelia Speich[1], Cassien Havugimana[1], S. Fuad Praha[2], Francine Bayisenge[1], Simon Kimenju[3], Kesso Gabrielle van Zutphen[4], Marnie Pannatier[5], Dominique Barjolle[6], and Helen Prytherch[1]

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While overweight and obesity are increasing worldwide, food security levels are worsening in many low- and middle-income countries, especially with the COVID-19 pandemic. Nutritious, locally and agroecologically produced foods can transform food systems, alleviate pressure on the environment, and improve diets. The Nutrition in City Ecosystems (NICE) project aims to improve nutrition for city populations through agricultural, food, and health sector collaborations. An assessment of nutritional and socio-economic status, knowledge, and consumption patterns, as well as an examination of the governance and environmental constraints of a city context, were conducted to inform the project design. Using a mixed-methods, cross-sectional design, baseline data were collected from 150 households (300 in Bangladesh) randomly selected in six secondary cities in Bangladesh (Dinajpur and Rangpur), Kenya (Bungoma and Busia), and Rwanda (Rubavu and Rusizi). Baseline data included the Household Food Insecurity Access Score (HFIAS; both current and before COVID-19), Household Diet Diversity Scores (HDDS), Minimum Dietary Diversity Scores Among Women (MDD-W), anthropometric measurements, household and socioeconomic information, and questions related to consumer behavior and food production decisions. Results show a substantial increase in food insecurity during the pandemic. Under-5 stunting rates are high, ranging from 9.1% in Busia to 49.4% in Rubavu, while around half of adult women are overweight (between 40.8% in Rusizi and 50.6% in Bungoma). Furthermore, many women did not consume an adequately diverse diet in all three countries (MDD-W is <5 for 29.3%, 47.5%, and 67.0%, respectively); however, many of the urban and peri-urban households owned farmland. Demand for and access to an affordable, healthy diet that comprises nutritious, local, and agroecologically produced foods presents a pathway for overcoming complex challenges related to malnutrition, a decline in biodiversity and soil fertility in city contexts. Further research with a specifically developed farmers survey is currently on-going to explore the potential of agroecological production practices and land ownership among the urban population. Transformation towards more resilient food systems with improved nutritional outcomes must be addressed holistically from farm to fork, and the learnings disseminated and scaled up.

Strengthening the Supply and Demand for Nutritious, Local, and Agro- Ecologically-Produced Foods in Secondary Cities in Bangladesh, Kenya, and Rwanda: A First Impression to Understand the Context

Authors

Tanja Barth-Jaeggi[1], Cornelia Speich[1], Cassien Havugimana[1], S. Fuad Pasha[2], Francine Bayisenge[1], Simon Kimenju[3], Kesso Gabrielle van Zutphen[4], Marnie Pannatier[5], Dominique Barjolle[6], and Helen Prytherch[1]

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Introduction and Objectives

While overweight and obesity are increasing globally, food security is worsening in many low- and middle-income countries, especially with the COVID-19 pandemic. Nutritious and locally and agroecologically produced foods offer the potential to transform food systems, alleviate pressure on the environment, and improve diets. The Nutrition in City Ecosystems (NICE) project aims to improve nutrition for urban populations through agricultural, food and health sector collaborations. An assessment of nutritional indicators, socio-economic status, food production and consumption patterns was conducted in six secondary cities from three countries between April and June 2021 to inform the project design.

Methods

- Mixed-methods, cross-sectional design;
- Target population: vulnerable people (slums, areas with reported malnutrition, etc.);
- In each city, 150-300 households were visited to assess
  - Household Food Insecurity Access Score;
- Household Dietary Diversity Scores;
  - Minimum Dietary Diversity Scores for Women;
  - Socioeconomic information;
  - Consumer behaviour;
  - Food production decisions;
  - Anthropometrics (stunting, wasting, under- and overweight);
- Health centers in the catchment area were visited to collect secondary data on birth weight and anaemia during pregnancy.

Conclusions

The double burden of malnutrition is a public health concern in secondary cities, and food security is worsening with the COVID-19 pandemic.

Demand for and access to an affordable, healthy diet, including nutritious, local and agroecologically produced food, presents a pathway for overcoming complex challenges related to malnutrition, a decline in biodiversity and poor soil fertility in city contexts.

The transformation towards more resilient food systems with improved nutritional outcomes needs to be addressed holistically from farm to fork. Vulnerable populations should be targeted, and learnings disseminated and scaled up.

Selected Results

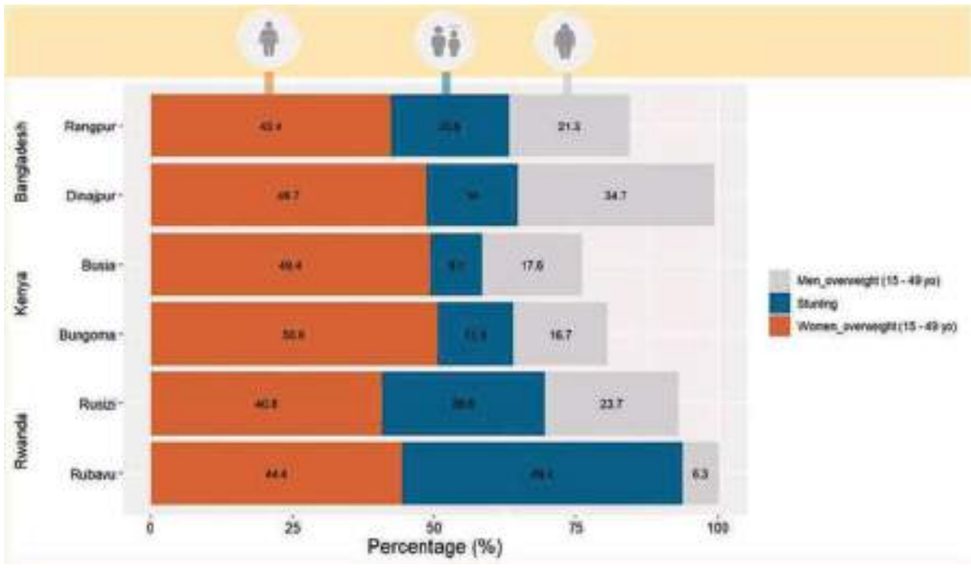


Figure 1. Child stunting and adult overweight in the 6 NICE focal cities in Bangladesh, Kenya, and Rwanda.

Table 1. Exclusive breastfeeding during the first 6 months of life, low birth weight and anaemia prevalence in pregnant women.

	Exclusive breastfeeding (n)	Low birth weight (n)	Anaemia in pregnancy (n)
Rangpur	52.3% (298)	19.6% (1771)	9.9% (4644)[1]
Dinajpur	59.4% (301)	18.9% (1851)	21.4% (1637)[1]
Busia	61.9% (168)	8.1% (869)	24.1% (1230)
Bungoma	47.0% (136)	6.3% (3077)	30.0% (3112)
Rusizi	50.0% (181)	-	-
Rubavu	62.6% (169)	-	-

Exclusive breastfeeding data collected within this survey. Low birth weight (<2500g) data and anaemia (hb>11g/dl) prevalence data collected through review of respective ANC records from Jan-May 2021 in Bangladesh and from Jan-Mar 2021 in Kenya.

[1]only NGOs1 antenatal care centers as governmental hospitals/clinics don't keep records of haemoglobin/anaemia.

Figure 2. Selected results from the baseline data assessment.

NICE is working across 6 SDGs:

Solar Energy in Rural Health Facilities: Experiences from the Field, Solafrica

Alicia Blair and Flora Conte
Solafrica, Bern, Switzerland

Energy poverty is a major challenge for the social and economic development in sub-Saharan Africa. In off-grid, decentralized health facilities, medical treatment and prevention options are limited without electronic devices. The quality and time available for operations are significantly reduced through the absence or poor quality of light. Health personnel suffer from bad working conditions, which negatively affect health services. Additionally, the use of diesel generators is expensive and an important source of air pollution and CO2. Photovoltaic energy (PV) provides a climate-friendly solution to improve energy access for health centers. However, important factors determine whether PV is functioning as expected. This poster aims to present the solar health projects of the Swiss NGO Solafrica in Cameroon and Burkina Faso and share lessons learned and the impact of introducing PV. Solafrica financially and technically supports local stakeholders to install high-quality and modern PV plants of 1-2kW in rural health centers, covering basic needs for small devices and lighting. In Cameroon, solar direct-drive vaccine refrigerators (SDD) are installed separately from the PV plants. Project implementation focuses on involving all required stakeholders (authorities, community, health personnel, etc.), ensuring after-sales maintenance through local solar service providers, and regular basic maintenance of the PV plants. When possible, remote monitoring devices are used to control power production and SDD temperature. The correct use of PV is explained through regular training. PV plants and SDD are continuously installed in different phases to benefit from lessons learned. In Burkina Faso, a significant increase in the number of patients could be observed after installing PV plants. However, natural conditions, especially dust in the air, are making the maintenance of PV plants more challenging than expected. In Cameroon, the conditions for vaccination were found to be optimized. However, the collaboration with national authorities provided certain limitations, and technical and organizational problems with the SDD were observed in certain cases. Through collaboration and dialogue between different NGOs, authorities, services providers, and health personnel, lessons learned about the use of PV for health can have a positive impact on other related or similar initiatives.

Solar Energy in Rural Health Facilities: Experiences from the Field, Solafrica

Authors

Alicia Blair and Flora Conte

Solafrica, Bern, Switzerland

Energy poverty, among other factors , is a major challenge for the public health sector in sub-Saharan Africa. In remote and off-grid health facilities, medical treatment and prevention are limited without proper access to light and electronic devices. Hence, reliable sources of electricity are expected to increase the quality of health care while also improving the working conditions and safety of health personnel. In rural health centres, access to sufficient light, small electronic devices and refrigerators is crucial. Diesel generators cause high costs that can rarely be sufficiently borne by rural health centres, as well as air pollution and CO2 emissions. This is why photovoltaic energy (PV or solar energy) is considered much more suitable. However, important factors determine whether PV functions as intended.

This poster aims to present the solar health experiences of the Swiss NGO Solafrica.

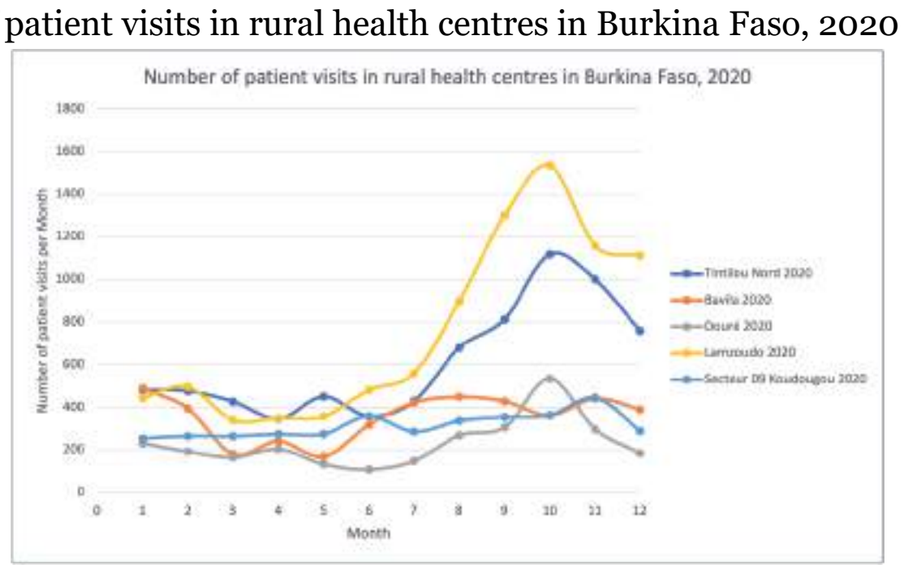
Results

In Burkina Faso, a significant increase in the number of patients could be observed after installing the first PV plants (see table below). However, natural conditions, especially dust in the air, create challenges for their maintenance.

In Cameroon, though for now only qualitative observations have been collected, the conditions for vaccinations were found to be optimised with SDD. Patients can receive vaccines at any time, and the risk of vaccines being exposed to unsuited temperatures is reduced.

Collaboration with national and local authorities is essential for the long-term use of solar devices, but is also linked to some limitations regarding the choice of devices and localities. Additionally, regime changes affect collaboration.

Number of patient visits in rural health centres in Burkina Faso, 2020



Methodology

Solafrica financially and technically supports local stakeholders to install high-quality and modern PV plants of 1–2kW in rural health centres, covering basic needs for small devices and lighting in Burkina Faso. Additionally, in Cameroon, solar direct drive vaccine refrigerators (SDD) are installed separately. Project implementation focuses on involving all required stakeholders (authorities, community, health personnel, etc.), ensuring regular basic maintenance of the PV plants on-site and repairs through local solar service providers. Remote monitoring devices are used to control power production and SDD temperature. The correct use of PV is explained through regular trainings. PV plants and SDD are continuously installed in different phases to benefit from lessons learnt.

Conclusion

The use of solar energy in off-grid rural health centres in sub-Saharan Africa improves the access to and quality of health care. It also reduces running energy costs and air pollution, as well as CO2 emissions. Several indirect positive effects also result from PV plants. Maintenance and repairs are a challenge due to physical factors such as dust, as well as practical and financial aspects. The latter two require the active participation of local stakeholders and the long-term involvement of authorities. Collaborations can be affected by regime changes, personnel changes or political decisions, and hence sufficient budget needs to be planned accordingly.

About us

Solafrica is an independent Swiss non-profit organisation that promotes solarenergy in economically disadvantaged regions, as well as in Switzerland, by awareness-raising, technical training, support in building infrastructure and technical innovation.

More information: www.solafrica.ch

Nurses Can! Survey on Roles and Responsibilities in Primary Health Care in Ukraine

Daryna Bogdan, Tetiana Stepurko, Mladena Kachurets, and Martin Raab
Ukrainian - Swiss Project "Medical Education Development", Kyiv, Ukraine

The introduction of new payment mechanisms on a per capita base in increasingly autonomous healthcare facilities has stimulated organizational development and service growth of primary healthcare (PHC) providers since 2018. Ukraine has been almost right in time to strengthen its healthcare system in the pre-COVID-19 time. Still, family doctors seem to be overloaded, while nurses are rarely considered professional partners in service provision. We aim to compare de jure and de facto arrangements in the role distribution among PHC personnel. Revealing the attitudes towards stronger involvement of nurses in clinical practice is further envisaged. Semi-structured interviews with 24 experts, PHC providers (qualitative study), and 592 CATI/CAWI (computer-assisted telephone/web interviews) with family doctors, nurses, and administrators (survey) were completed in 2021. The survey was conducted by a sociological agency, and the sample drawn was based on a list of PHC providers from the National Healthcare Service following a stratified representative approach. The current legal base of (family) nursing is outdated and confusing; however, it allows the determination of the scope of work of a nurse to be specified at the level of each healthcare facility. According to survey results, managers and doctors mostly support the idea of expanding the role and responsibilities of nurses (84% and 65%) and believe that nurses can strengthen service provision, especially in the COVID-19-affected context. Nurses confirmed this to a lesser extent but still support the idea of redistribution of functions (52%). Doctors, nurses, and managers indicate that nurses can be fully responsible for taking samples (express tests, etc.), conducting diagnostics (ECG, blood pressure, pulse oximetry), vaccination, and revealing life habits (including eating habits, level of physical activity, etc.).
Experts drew attention to the imbalance of theoretical and practical parts of nurses' training, as well as the obsolescence of the formats of their training. There is a clear need to develop the nurse's communication and counseling skills and to develop a holistic and patient-centered approach to care. Expanding the role of nurses has received support from involved stakeholders but would require modernized educational programs to build new competencies, especially considering the COVID-19 crisis.

Nurses Can! Survey on Roles and Responsibilities in Primary Health Care in Ukraine

Authors

Daryna Bogdan, Tetiana Stepurko, Mladena Kachurets, and Martin Raab

Ukrainian - Swiss Project "Medical Education Development", Kyiv, Ukraine

Introduction

Ukraine was right on time in strengthening its health care system pre-COVID-19. The introduction of new payment mechanisms on a per capita basis in increasingly autonomous health care facilities has been stimulating the organizational development and service growth of primary health care (PHC) providers since 2018.

Still, family doctors seem to be overloaded, while nurses are rarely considered to be professional partners in service provision. We are currently seeing an increase in the number of countries where nurses are taking on more primary care responsibilities. The level of autonomy and accountability of nurses with extended roles depends on the context of the country in which they practice and its regulatory policies.

The aim of this study is to compare de jure and de facto arrangements in the role distribution among PHC personnel in Ukraine. Revealing the attitudes towards a stronger involvement of nurses into clinical practice is further envisaged.

Methods

Desk research

Review of normative legislative documents that outline the role of nurses in primary health care.

Previous research and international approaches to the definition of nursing competencies.

Qualitative part

Semi-structured interviews:

Eleven interviews with experts (including representatives from NHS, MOH, PHC facilities, WHO, international projects, etc.). Thirteen provider interviews (including four with nurses, four with PHC managers, and five with GPs, representing both private and public PHC facilities from Western, Eastern, Southern and Central UA).

Quantitative part

A total of 592 CATI/CAWI (computer assisted telephone/web interviews) including:

- Managers (140);
- Nurses (250);
- GPS (242).

Data were collected by the research agency Infosapiens.

Results

The current legal base of (family) nursing is outdated and confusing.

According to survey results, managers and doctors mostly support the idea of expanding the roles and responsibilities of nurses and believe that nurses can strengthen service provision, especially in a COVID-19 affected context.

A total of 38% of nurses disagree with the delegation of the doctors' tasks and they give less support to responsibilities changes (52%). All audiences chose absence of financial motivation as the greatest barrier for expanding the role of family nurses.

The real situation is when a nurse takes over the functions of a doctor and does it herself, but officially all the documents are signed by the doctor.

"At the beginning it was very difficult. It turned out that a doctor cannot do anything without a nurse. S/He can only think but cannot do. So, the doctors were the first to oppose this. "How can I work alone? Who will do the paperwork?"

They straightened their shoulders, they felt like a specialist, as they say. Well, they like it. Because also in the eyes of the patients, they have become more professional, it seems to me.

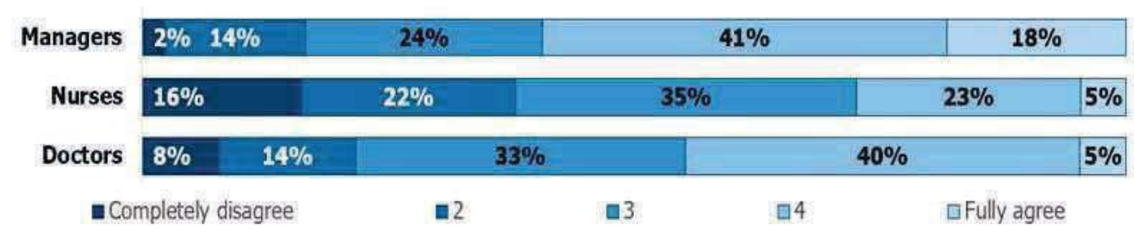
Doctors, nurses and managers indicate that nurses can be fully responsible for taking samples (express tests, etc.), conducting diagnostics (ECGs, blood pressure, pulse oximetry), vaccination, and investigating life habits (including eating habits, level of physical activity, etc.).

Experts drew attention to the imbalance in theoretical and practical parts of nurses' training, as well as the obsolescence of the formats of their training. According to survey results, only 46% of nurses' knowledge and skills were gained during pre-graduate education.

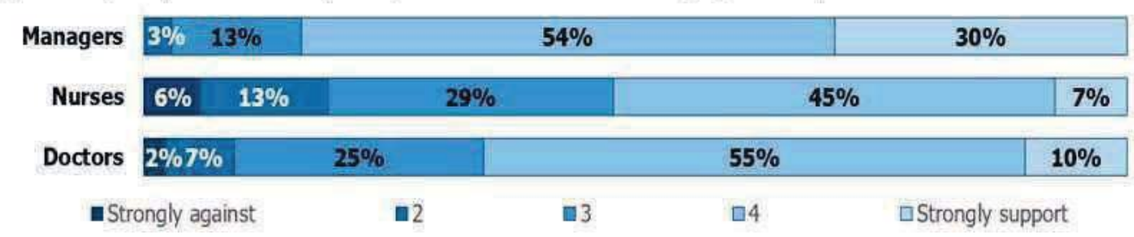
Unfortunately, from what I see now, the level of knowledge that nurses come up with is very theoretical. There are very few practical skills. We are provided with theoretical baggage in our universities or in our specialized medical education institutions, which we often do not use at all. They need more practical skills. Because they come quite like a blank slate. And you start saying: this is your workplace, here you are doing something, here you are doing something. Have you tried an intravenous injection on a patient? He says, "I tried, but something doesn't work," or "I'm afraid".

All audiences believed in the positive effects of the re- distribution of roles between nurses and doctors. Managers believed in reducing doctors' workloads significantly more than doctors and nurses did.

To what extent do you agree with the following statement: PHC doctors spend a lot of time doing tasks that could be delegated to nursing staff?



Overall, what is your opinion about expanding the role of nurses and changing their responsibilities?



Conclusions

Current legal base of (family) nursing allows the determination of scope of work of a nurse to be specified at the level of each health care facility.

Expanding the role of nurses has support from involved stakeholders but would require modernized educational programs to build new competencies, especially considering COVID-19 crisis

There is a clear need to develop the nurse's communication and counseling skills, and to develop a holistic and patient-centered approach to care.

The Project is financed by Swiss Agency of Development and Cooperation. Views and ideas, published here, belong to the author(s) and do not necessarily reflect views of Swiss Agency of Development and Cooperation.

Impact of Heat Stress on Pregnant Subsistence Farmers in West Africa

Ana Bonell[1], Bakary Sonko[1], Jainaba Badjie[1], Tida Samateh[1], Tida Saidy[1], Fatou Sosseh[1], Yahya Sallah[1], Kebba Bajo[1], Kris A. Murray[1,2,3], Jane Hirst[4], Ana Vicedo-Cabrera[5,6], Andrew M. Prentice[1], Neil S. Maxwell[7], and Andy Haines[2]

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[7] Environmental Extremes Laboratory, University of Brighton, Eastbourne, UK

Anthropogenic climate change has led to increasingly extreme temperatures worldwide. Sub-Saharan Africa (SSA), including West Africa, is considered especially vulnerable to the impacts of climate extremes. In SSA, women make up 50% of the agricultural workforce and often work throughout pregnancy, while maternal exposure to high temperatures increases the risk of adverse birth outcomes. Understanding the physiological mechanisms responsible is central to designing targeted interventions to reduce the risks of heat exposure. This observational cohort study utilized the high heat stress in West Africa to gain an understanding of the physiological impact of heat on maternal and fetal physiology. Pregnant subsistence farmers who performed manual tasks throughout pregnancy were observed during field visits where environmental measurements, maternal physiology (e.g., heat strain), and fetal stress (fetal heart rate > 160 or < 115, or increase in umbilical artery resistance index) were measured. A total of 92 participants were included (122 field visits). Extreme heat stress was observed in 31% of field visits. Maternal temperature, heat strain, and fetal heart rate were all significantly increased from baseline to working. Fetal stress occurred in 41/122 (33%) field visits. Multilevel modeling revealed that fetal stress was significantly associated with both universal thermal climate index (OR 1·17, CI 1·05;1·29, p=0.01) and gestational age (OR 1·12, CI 1·02;1·22, p=0.02). Interpretation: Decreasing maternal exposure to heat stress in later pregnancy may reduce fetal stress, a potential pathophysiological mechanism leading to adverse birth outcomes. There is an urgent need to explore this further.

Impact of Heat Stress on Pregnant Subsistence Farmers in West Africa

Authors

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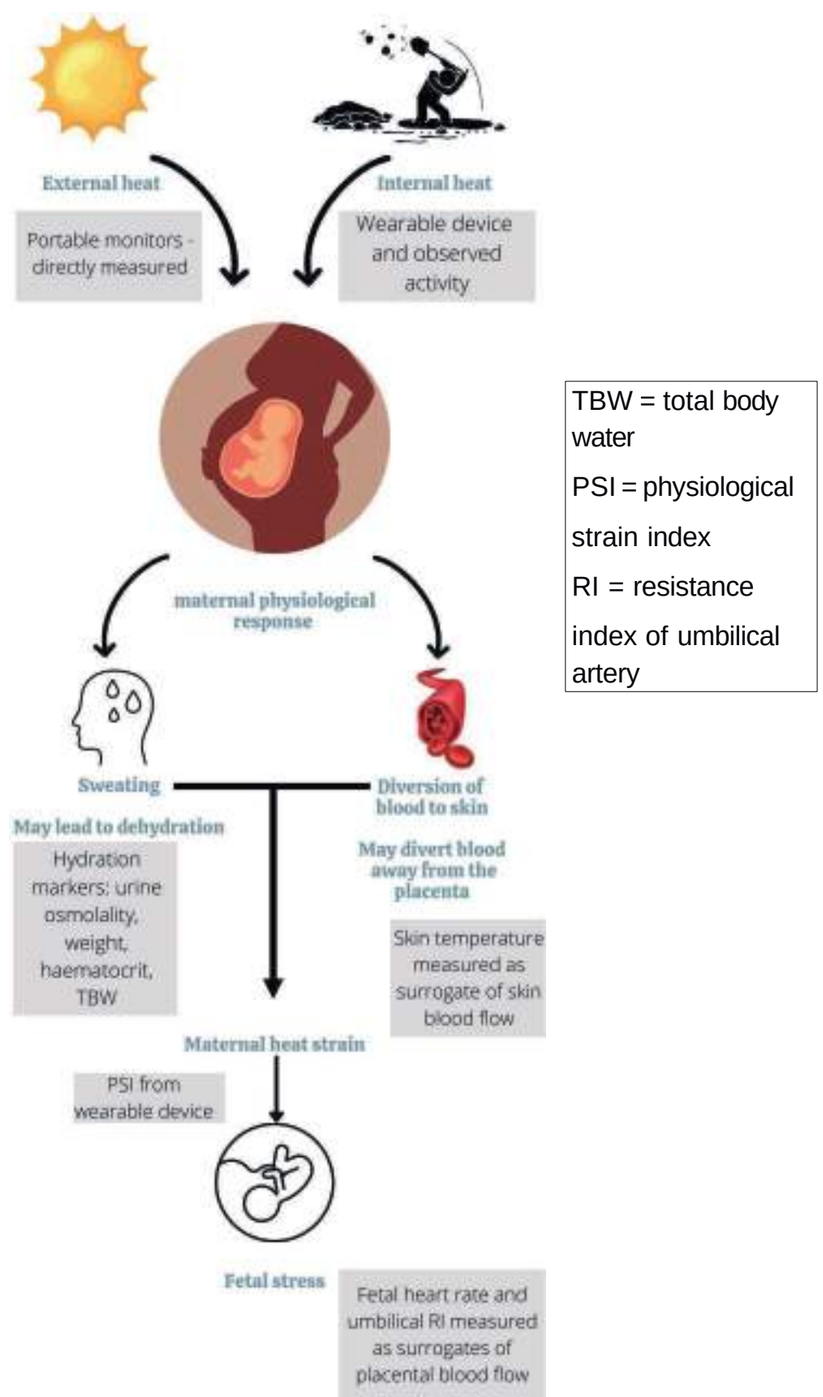
Introduction

Anthropogenic climate change has led to increasingly extreme temperatures worldwide. Sub-Saharan Africa (SSA), including West Africa, is considered especially vulnerable to the impacts of climate extremes. In SSA, women make up 50% of the agricultural workforce and often work throughout pregnancy, while maternal exposure to high temperatures increases the risk of adverse birth outcomes. Understanding the physiological mechanisms responsible is central to designing targeted interventions to reduce the risks of heat exposure.

Methods

This observational cohort study utilised high heat stress in West Africa to gain an understanding of the physiological impact of heat on maternal and fetal physiology. Pregnant subsistence farmers who performed manual tasks throughout pregnancy were observed during field visits, and environmental measurements, maternal physiology (e.g. heat strain) and fetal stress (fetal heart rate > 160 or < 115, or increase in umbilical artery resistance index) were measured.



Schematic representation of physiological responses to thermal factors, and measurements taken at each field visit to quantify these factors in grey.

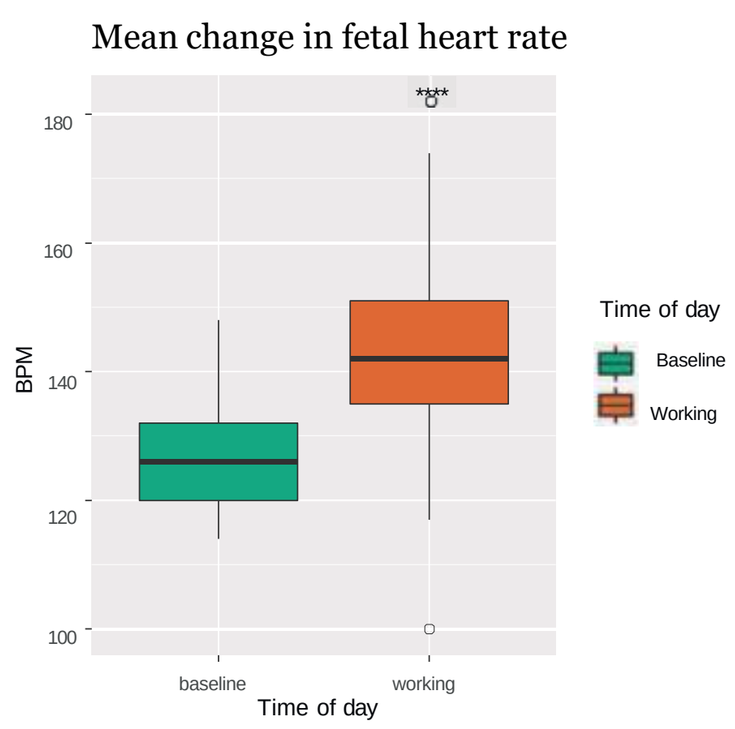
Results

A total of 92 participants were included (122 field visits). Extreme heat stress was observed in 31% of field visits. Maternal temperature, heat strain and fetal heart rate were all significantly increased from baseline to working. Fetal stress occurred in 41/122 (33%) field visits. Multilevel modelling revealed that fetal stress was significantly associated with both Universal Thermal Climate Index (OR 1·17, CI 1·05;1·29, p=0.01) and gestational age (OR 1·12, CI 1·02;1·22, p=0.02). Multilevel model of fetal stress.

	Odds Ratio	95% CI	P-value
Intercept	0.00	0.00;0.28	
UTCI	1.17	1.05;1.29	0.01
PSI	1.20	0.99;1.46	0.06
Gestational age	1.12	1.02;1.22	0.02
Osmolality	1.00	1.00;1.00	0.61
Haematocrit	0.97	0.87;1.07	0.49
TBW	0.93	0.83;1.05	0.27

UTCI = universal thermal climate index; PSI = physiological strain index; TBW = total body water

Decreasing maternal exposure to heat stress in later pregnancy may reduce fetal stress, a potential pathophysiological mechanism leading to adverse birth outcomes. However, there remain large evidence gaps in relation to the pathophysiology of heat in pregnancy, the identification of those at risk and the development of suitable and effective interventions to reduce adverse birth outcomes. Further work exploring changes in placental blood flow and the association with pregnancy outcomes is urgently needed, in a variety of settings and populations. In addition, co-development and trials of interventions in pregnant subsistence farmers in SSA would be a welcome and exciting area to explore.



Mean change in fetal heart rate from cool baseline to heat-exposed work environment.

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Involvement of Panton–Valentine Leukocidin-Producing Staphylococcus aureus in Staphylococcal Skin Diseases in Patients in Peri-Urban Benin

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Staphylococcus aureus is a pathogen that colonizes a large part of the general population and causes a wide spectrum of diseases. About 3% of S. aureus strains express a virulence factor called Panton–Valentine leucocidin (PVL). This study aims to highlight the role of PVL in staphylococcal infections in a peri-urban area of Benin. This is a study that involved a cohort of 124 patients with the staphylococcal disease (wound, abscess, furuncle, osteomyositis, pyomisitis) received at the " Réservoir de Siloé " health center in Hlagba-ouassa, commune de Zogbodomè, from November 2014 to December 2017. Data were retrospectively collected in 71 patients and prospective and longitudinal in 53 patients. The profile of the 123 patients was established on the basis of sociodemographic, clinical, microbiological, hematological, and immunological parameters. Patients are female-dominated, with a sex ratio equal to 80%, and a slice of [1; 10 years] that was the most represented as 68.55%. A total of 54.03% use traditional medicine for treatment, and only 10.28% of patients use probabilistic antibiotic therapy. With regard to microbiological analysis, 129 cases of S. aureus have been isolated, with 100% in pyomyositis cases. A total of 29.61% of strains of S. aureus are resistant to the tested antibiotics, of which 100% are penicillin. A total of 70.39% of strains of S. aureus are susceptible to tested antibiotics, including 100% vancomycin and ciprofloxacin. A total of 75.61% of S. aureus strains produce PVL, and 89.15% of its strains are sensitive to meticillin. Follow-up showed that patients with PVL + showed, at the start of treatment, leukocytosis (91.18%) and a decrease in CD4 compared to those with LPV-. It was noted that a gradual improvement of immunological parameters became normal in almost all patients at the fourth week of follow-up. S. aureus, a producer of PVL, plays a major role in staphylococcal infections in peri-urban areas in Benin. The presence of methicillin-sensitive strains suggests the loss of the horizontal transfer meticillin resistance gene.

Involvement of Panton–Valentine Leukocidin-Producing Staphylococcus aureus in Staphylococcal Skin Diseases in Patients in Peri-Urban Benin

Authors

Bawa Boya[1], Hachim Mamadou[1], and Théodora A. Ahoyo[2]

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Introduction: Staphylococcus aureus is a pathogen that colonizes a large part of the general population and causes a wide spectrum of diseases. About 3% of S. aureus strains express a virulence factor called Panton-Valentine Leucocidin (PVL). This study aims to highlight the role of PVL in staphylococcal infections in a peri-urban area of Benin.

Methodology

This study focused on a cohort of 124 patients with staphylococcal diseases (wound, abscess, furuncle, osteomyositis and pyomisitis) received at the "Siloe Reservoir" health center in Hlagba-ouassa, a commune of Zogbodome, from November 2014 to December 2017. Data were collected retrospectively on 71 patients and prospectively and longitudinally on 53 patients. The profile of the 124 patients was established on the basis of sociodemographic, clinical, microbiological, hematological and immunological parameters. Then, the immunological follow-up of the cohort of 53 patients (34 PVL+ and 19 PVL-) was performed weekly for 4 weeks on the basis of the following parameters: CRP, VS, NB, CD4.

The patients were predominately female, with a sex ratio equal to 0.8, and the age group [1; 10 years] was the most represented, i.e., 68.55%. The age group [1 to 10 years] was the most affected regardless of disease. The most common diseases were pyomyositis (42.74%), osteomyelitis (24.19%) and abscesses (20.97%). Before the medical consultaion, 54.03% of the patients first resorted to traditional medicine to treat themselves, and 10.28% resorted to probabalistic antibiotic therapy (Figure 1).

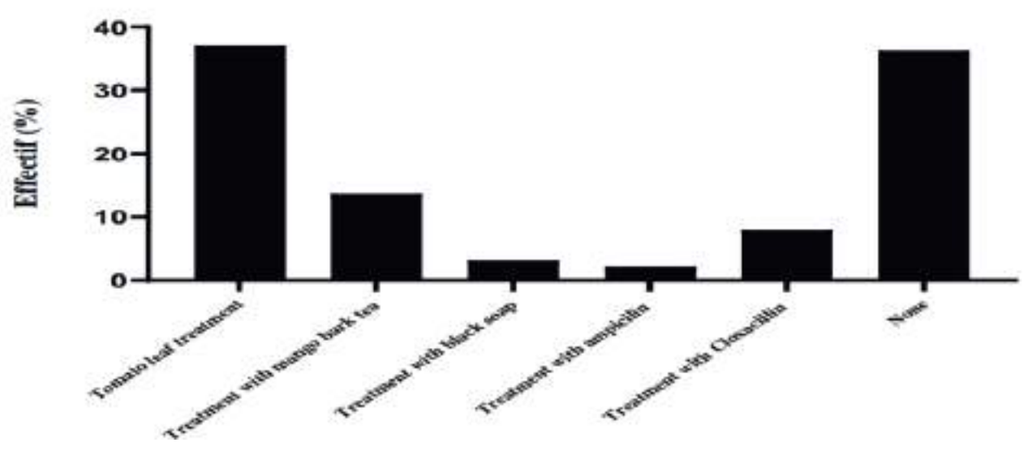

Figure 1. Distribution of patients according to treatment at home.

Bacterial species isolated according to the type of infection

Figure 2 shows that Staphylococcus aureus was isolated in 83.11% of the cases studied, and the majority of Staphylococcus aureus was isolated in pure culture in 100% of the pyomyositis cases. There was no significant difference between the bacterial strains according to the infections (p >0.9999).

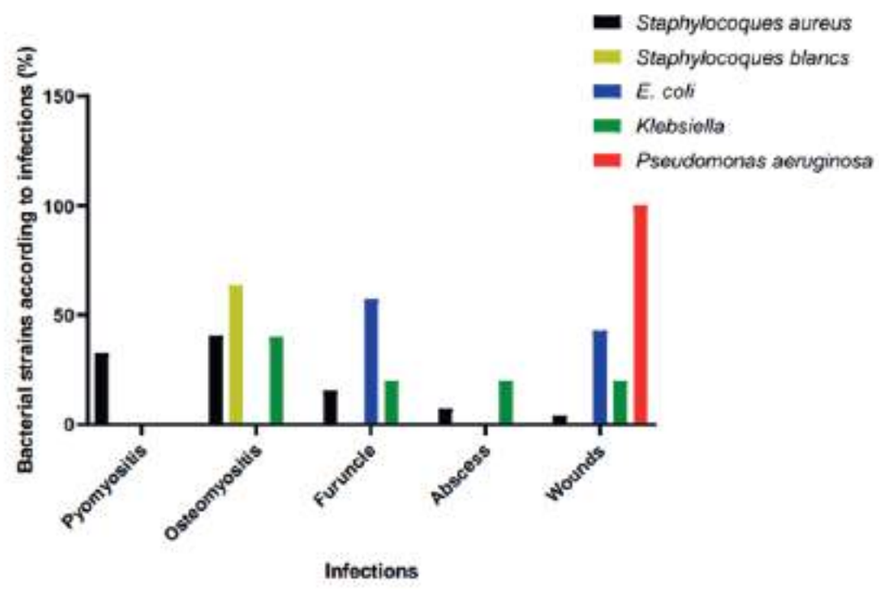

Figure 2. Distribution of bacterial strains according to infections.

A total of 29.61% of Staphylococcus aureus strains were resistant to the antibiotics tested, including 100% to Penicillin. A total of 70.39% of Staphylococcus aureus stains were sensitive to the antibiotics tested, including 100% to Vancomycin and Ciprofloxacin. A total of 91 strains of S. aureus out of 123 isolated produced Panton-Valentine leucocidin (PVL), i.e., 73.98% of the strains tested. All PVL-producing S. aureus strains were sensitive to methicillin, while 40.63% of non-PVL- producing S. aureus strains were resistant to methicillin. There was no significant difference between methicillin-susceptible and methicillin-resistant S. aureus strains (p> 0.9999) according to the production of PVL.

The majority of patients were seronegative with a CPR level higher than 6mg/l at admission. Despite this seronegative result, we observed a depletion in T4 lymphocytes in most patients. The follow-up of the patients over four weeks showed a clear improvement of the immunological parameters in the majority (even though the literature does not say much about this case, this indicates the impact of PVL on the immune system of PVL+ patients.

Conclusions

S. aureus, as a producer of PVL, plays a major role in staphylococcal infections in peri-urban areas in Benin. The presence of methicillin-sensitive strains suggests the loss of the horizontal transfer methicillin-resistance gene.

Keywords: S. aureus; PVL; staphylococcal skin infections; community; Benin

Acknowledgements: The authors express their gratitude to the LBTMM staff for their contribution to this study

Risk of Vibrio Transmission Linked to Consumption and Contact with Water in Benin

Bawa Boya[1], Hachim Mamadou[1], Théodora A. Ahoyo[1], and Lamine Saïd Baba Moussa[1]
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Vibrio infections have increased in Benin, and this phenomenon is expected to increase due to climate change, increased consumption of contaminated water, and the number of people who are immunocompromised. The objective of this study was to evaluate the risk of Vibrio transmission linked to the use of contaminated water in Benin. Water samples [n = 220] were analyzed to isolate Vibrio strains using their biochemical and cultural characteristics. The species were identified by the polymerase chain reaction technique by monitoring the search for genes encoding the cholera toxin of Vibrio cholerae [ctxA and ctxB] and the direct thermostable and thermostable hemolysins linked to Vibrio parahaemolyticus [tdh and trh].

Among the 220 collected samples, the biochemical tests revealed 86 strains of Vibrio species; Vibrio cholerae [35%], Vibrio parahaemolyticus [18.60%], and Vibrio alginolyticus [13.95%] were identified using a molecular tool; the presence of genes encoding the main virulence factors of the strains was studied. Thus 6.67%, 10%, and 3.33% of the strains of Vibrio cholerae, respectively, contain the toxins ctxA, ctxB, and the couple ctxA and ctxB. Likewise, the Vibrio parahaemolyticus strains contain 12.5% tdh toxins and 31.25% [tdh and trh].

The search for genes [tdh and trh] in Vibrio alginolyticus was also negative. A waterborne infection, cholera, is spread by ingesting food or water contaminated with bacteria. Human droppings may be predominant because, during sample collection, it was observed that areas of people frequently defecate in the wild. It is noted that the latrines and waste dumps are located in the immediate environment of some lakes, lagoons, and rivers sampled. Under these conditions, the contamination of the waters of lakes, lagoons, and rivers by rejected excreta is favored by runoff and infiltration of rainwater. Epidemics can be triggered by natural or fabricated events that contaminate drinking water or compromise access to safe drinking water and sanitation. The incidence of vibriosis is increasing, perhaps in part because of the spread of Vibrio species promoted by climate change and increasing water temperature.

Risk of Vibrio Transmission Linked to Consumption and Contact with Water in Benin

Authors

Bawa Boya[1], Hachim Mamadou[1], Théodora A. Ahoyo[2], and Lamine Saïd Baba Moussa[1]

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Introduction

Vibrio infections have increased in Benin, and this phenomenon is expected to increase due to climate change, increased consumption of contaminated water and the number of people who are immunocompromised. The objective of this study was to evaluate the risk of Vibrio transmission linked to the use of contaminated water in Benin.

Methodology

Water samples [n = 220] were analyzed to isolate Vibrio strains using their biochemical and cultural characteristics. The species were identified using the Polymerase Chain Reaction technique by monitoring the search for genes encoding the cholera toxin of Vibrio cholerae [ctxA and ctxB] and the direct thermostable and thermostable hemolysins linked to *Vibrio parahaemolyticus [tdh and trh].*

Table 1. List of primers used for the molecular characterization of Vibrio strains

Gènes cibles	Amorces	Séquence (5-3)	Taille des fragments amplifiés
16S/23S ISR	VC-F	5'-TTA AGC STT TTC RCT GAG AAT G- 3'	295-310 pb
	VCM-R	5'-AGT CAC TTA ACC ATA CAA CCC G- 3'	
Pr72H	VP32	5'-CGA ATC CTT GAA CAT ACG CAG C- 3'	320-387 pb
ToxR	VP33	5'-TGC GAA TTC GAT AGG GTG TTA ACC-3'	368
	ToxR 4	5'-GTC TTC TGA CGC AAT CGT TG- 3'	
	ToxR 7	5'-ATA CGA GTG GTT GCT GTC ATG- 3'	
ctxA	CTX2	5'-CGG GCA GAT TCT AGA CCT CCT G- 3'	564 pb
	CTX3	5'-CGA TGA TCT TGG AGC ATT CCC AC- 3'	
ctxB	CTX7	5'-GGT TGC TTC TCA TCA TCG AAC CAC- 3'	460 pb
	CTX9B	5'-GAT ACA CAT AAT AGA ATT AAG GAT G- 3'	
tdh	L.tdh	5'-GTA AAG GTC TCT GAC TTT TGG AC- 3'	269 pb
	R.tdh	5'-TGG AAT AGA ACC TTC ATC TTC ACC- 3'	
trh	L.trh	5'-TTG GCT TCG ATA TTT TCA GTA TCT- 3'	500 pb
	R.trh	5'CAT AAC AAA CAT ATG CCC ATT TCC G-3'	

Results

The results of the incidence of Vibrio and other strains in the different communes are summarized in Figures 2 and 3. Thus, it appears that the collected water samples were contaminated by Citrobacter freundii (17.73%), Vibrio spp (32.73%), Proteus spp (20.45%), Salmonella spp (28.18%) and Escherichia coli (23.18%). The lowest rate of Vibrio spp (15%) was obtained in the communes of Athieme and Seme-Podji, while a high rate of Vibrio spp (65%) was obtained in the commune of Savalou. In addition, Salmonella sp. was highly identified (60%) in the samples collected in the municipality of Aguegue. Concerning the Escherichia coli strains, they were highly isolated from the samples collected in the northern (85% for Parakou and 55% for Djougou) part of the country.

Molecular Identification of Vibrio species

Of the 86 strains of Vibrio isolated from sampled waters, 13.95% belonged to the species V. alginolyticus, 18.60% to the species V. parahaemolyticus, 35% to the species V cholerae and 32.56% to the species Vibrio spp.

Acknowledgements : The authors express their gratitude to the LBTMM staff for their contribution to this study.

Distribution of Virulence Factors in Vibrio Species

The genes encoding major virulence factors, cholera toxins of V. cholerae [ctxA and ctxB] and the direct and thermostable heat- stable hemolysins of V. parahaemo- lyticus [tdh and trh] were detected in strains of V. cholerae and V. parahaemolyticus, which we characterized using PCR. Thus, the characterized Vibrio cholerae strains harbored the gene encoding for ctxA [6.67%], ctxB [10%] and the couple ctxA-ctxB [3.33%] toxins [Figure 1]. Likewise, the 12.5% V. parahaemolyticus strains contained the encoding for tdh toxins and 31.25% of them harbored both tdh and trh [Figure 2]. The search for genes [tdh and trh] in V. alginolyticus was also negative.

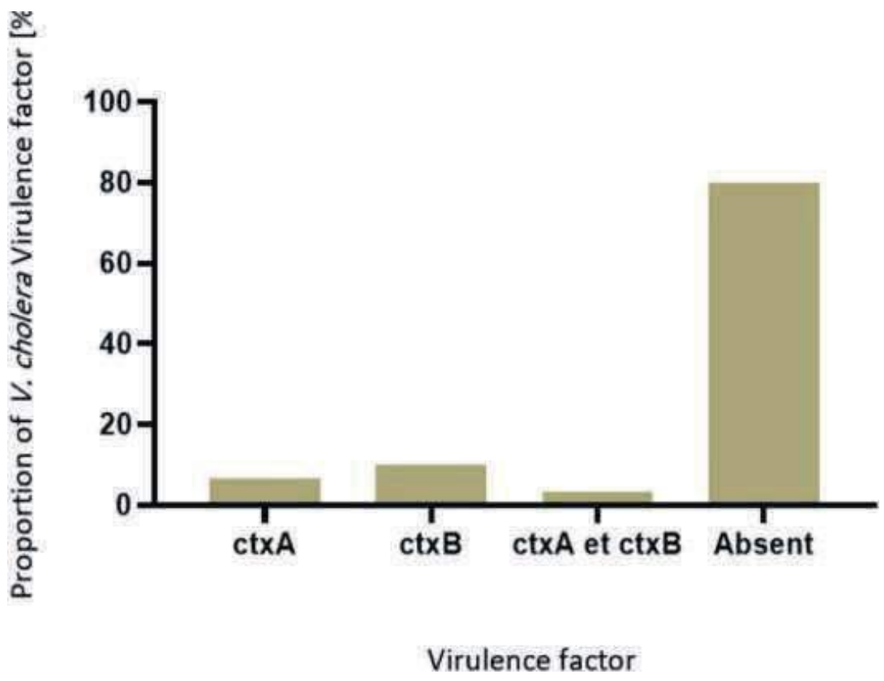


Figure 1. Percentage of Vibrio cholerae species carrying genes encoding cholera toxin.

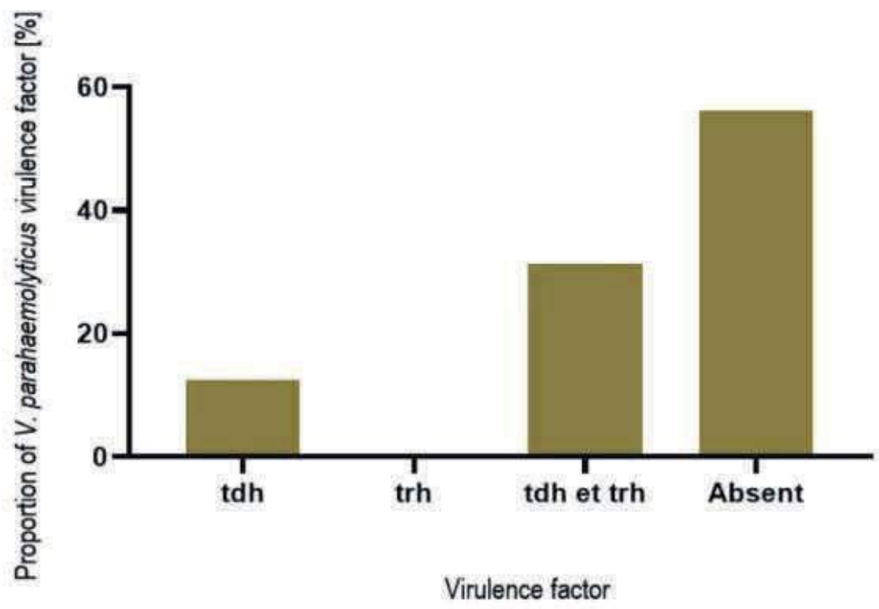


Figure 2. Percentage of Vibrio parahaemolyticus species harboring genes encoding the hemolysins tdh and trh.

Conclusions

Epidemics can be triggered by natural or fabricated events that contaminate drinking water or compromise access to safe drinking water and sanitation. The incidence of vibriosis is increasing, perhaps in part because of the spread of Vibrio species promoted by climate change and increasing water temperature.

Keywords: water; Vibrio species; polymerase chain reaction; virulence genes; bacterial resistance

The Necessary Transformation: Accommodating Livestock in Multidisciplinary Approaches to Health in Displacement

Dorien H. Braam
University Of Cambridge, Cambridge, United Kingdom

In the midst of the zoonotic COVID-19 pandemic, there is increasing concern for further zoonotic disease spillover as the world faces more frequent outbreaks of infectious animal diseases such as avian influenza and African swine fever. At the same time, the impact of environmental degradation and disasters as a result of climate change is causing unprecedented displacement, in particular in regions with livestock-dependent populations, risking the introduction of pathogens into new environments, with severe risks to global health security. There has been very limited research, however, into animals in displacement and zoonotic disease dynamics, which this study aims to address. Using a case study methodology, this study conducted qualitative interviews and observations in displacement settings in Jordan and Pakistan, supported by secondary data and a literature review. Moving into new environments, and interacting with host populations, including livestock and wildlife, all impact zoonotic disease transmission risk during forced migration. However, in the study locations, the impact of zoonoses depended primarily on underlying risk factors grounded in historical, political, and socio-economic profiles of both forced migrant and host populations. Livestock was a prime consideration in development dynamics, as the only movable asset occupying an important position within the household, and communities and households split up depending on the optimal location for their animals. Meanwhile, status, connections, and available resources were more important indicators of animal and human health outcomes than forced migration itself, which rather than a risk factor, can be considered as a process impacting the existing social determinants of health. This indicates that novel multidisciplinary approaches are required to respond to zoonotic disease risk in forced migration. As livelihoods and livestock need to be better accommodated during displacement for health and recovery, Planetary and One Health frameworks can provide the multidisciplinary approach required to address zoonotic disease risk during forced migration, notably through the inclusion of social science disciplines such as anthropology and social epidemiology.

The Necessary Transformation: Accommodating Livestock in Multidisciplinary Approaches to Health in Displacement

Authors

Dorien .H. Braam

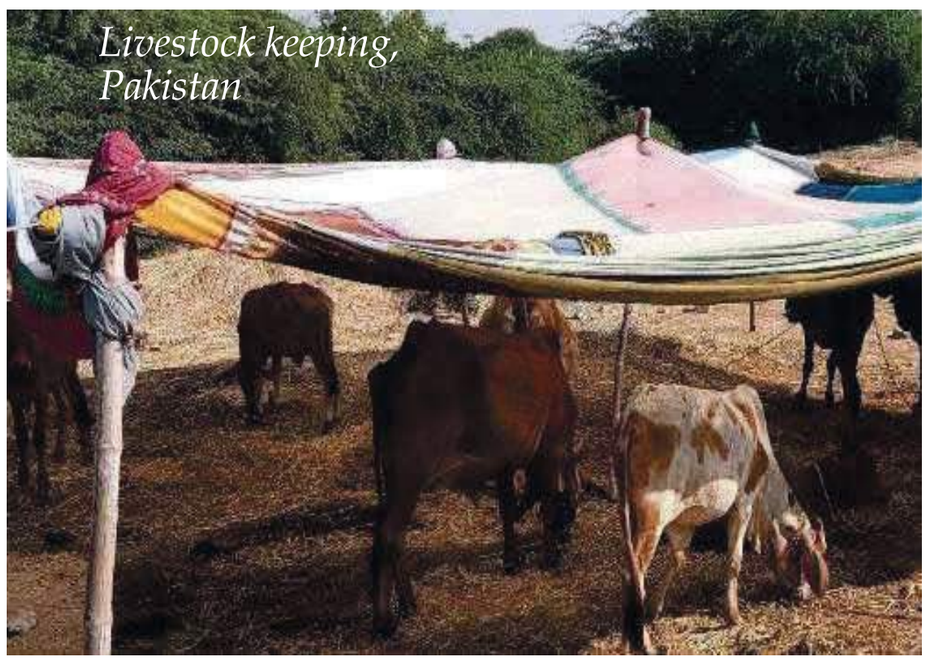
University of Cambridge, Department of Veterinary Medicine, Disease Dynamics Unit

Introduction and Objectives

In the midst of the COVID-19 pandemic, there is increasing concern for further zoonotic disease spillover, as the world faces more frequent outbreaks of infectious (animal) diseases such as Avian Influenza (AI) and African Swine Fever (ASF). At the same time, the impact of environmental degradation and disasters as a result of climate change is causing unprecedented displacement, in particular in regions with livestock-dependent populations, risking the introduction of pathogens into new environments, with severe risks to global health security. There has been very limited research, however, into animals in displacement and zoonotic disease dynamics, which my study aims to address.

Methodology

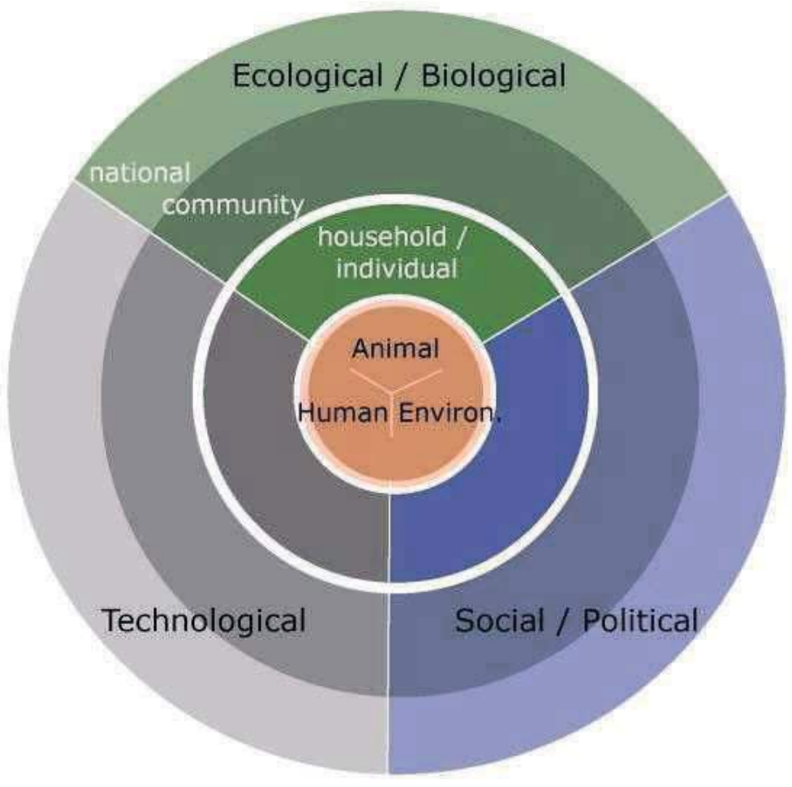
Using a case study methodology, I conducted qualitative interviews and observations in displacement settings in Jordan and Pakistan, supported by secondary data and a literature review.



Results and Discussion

Moving into new environments and interacting with host populations, including livestock and wildlife, impact the risk of zoonotic disease transmission during forced migration. However, in the study locations, the impact of zoonoses depended primarily on underlying risk factors, grounded in historical, political and socio-economic profiles of both forced migrant and host populations. Livestock was a prime consideration in development dynamics, as the only movable asset, occupying an important position within the household, and communities and households split up depending on the optimal location for their animals. Meanwhile, status, connections and available resources were more important indicators of animal and human health outcomes than forced migration itself, which rather than a risk factor can be considered as a process impacting the existing social determinants of health. This indicates that novel multidisciplinary approaches are required to respond to zoonotic disease risk in forced migration.

Proposed interdisciplinary framework (D.H. Braam, 2022).



Conclusions

As livelihoods and livestock need to be better accommodated during displacement, for reasons of health and recovery, interdisciplinary framework can provide the transdisciplinary approach required to address zoonotic disease risk during forced migration, and crucially through the inclusion of social science disciplines such as anthropology an social epidemiology.

GATES Cambridge

UNIVERSITY OF CAMBRIDGE
Department of Veterinary Medicine

Support and Accompaniment of Eco-Suffering by a Network of "Underground" Mental Health Professionals, or How to Unclog the Main Mental Health Systems?

Mathilde Brault, Sabrina Tacchini, and Patricia Wegmann
Independent, Geneva, Switzerland

Awareness of the seriousness of climate disruption and the collapse of biodiversity, leading to the COVID-19 pandemic, among other things, is accompanied by profound psychological suffering, with major consequences for health and everyday functioning [1]. The number of people with eco-anxiety is increasing [3]. Psychological care systems are already overwhelmed, especially for the vulnerable population of children and adolescents; 70% of psychologists have been unable to provide care to people suffering from the pandemic due to lack of availability [4]. In addition, with health costs rising year after year, we want to present alternatives to the classic care system based on primary prevention and the development of individual, collective, and ecosystemic resilience [7]. In French-speaking Switzerland, health and social care professionals have joined forces to create field practices and provide support for eco-anxious people outside institutions. As eco-anxiety is a form of collective suffering, group trauma care is developing. These group practices are designed to be simple and easy to teach. A transition network is being created, with an increasing number of professionals and individuals offering spaces with a common core of practices. These systems question the understanding and management of mental health and propose a change of vision that adopts an ecosystemic understanding of health (individual, collective, and living within planetary limits. Implementing these practices helps to reduce anxiety levels, enabling cognitive clarity to face the planetary transformations as well as those of our societies that will follow. Developing these practices, in collaboration with institutions, schools, and professional circles, would enable us to support and accompany the population and thus relieve an already strained healthcare system.

Soutien et accompagnement des éco-souffrances par un réseau de professionel.le.s de la santé mentale "underground", ou comment désengorger les systèmes principaux de santé psychique?

Authors

Mathilde Brault, Sabrina Tacchini, and Patricia Wegmann

Psychiatre Doctor's for Extinction Rebellion

Introduction

La prise de conscience de la gravité du dérèglement climatique et de l'effondrement de la biodiversité, générant entre autres la pandémie Covid-19, s'accompagne de profondes souffrances psychiques qui ont d'importantes conséquences sur la santé et sur le fonctionnement au quotidien [1]. Celles-ci sont d'ailleurs rarement prises en compte dans les impacts des crises actuelles [2], selon une étude récente, nombreux sont les jeunes présentant une inquiétude pour leur futur [3]. En tant que professionnelles de la santé mentale, notre inquiétude se trouve aussi dans la prise en charge aujourd'hui et dans le futur, de ces personnes en détresse; 7 % des psychologues n'ont pu dispenser des soins suite à la pandémie par manque de disponibilité [4]. De plus, les coûts de la santé sont année après année en augmentation, tout comme la prévalence des maladies mentales. Il s'agit dès lors de penser impérativement des options parallèles à notre modèle de santé onéreux. D'ailleurs, l'éco-anxiété ne devrait pas être considérée comme une pathologie mentale, mais plutôt comme une manifestation saine dans un monde abîmé [5]. Pour répondre à cela, des alternatives au système de prise en charge classique se développent, basées sur de la prévention primaire et sur le développement de la résilience individuelle, collective et écologique [5].

Dispositif

Pour répondre à l'éco-anxiété, en Suisse romande des professionnel.les du domaine de la santé s'unissent pour créer des pratiques de terrain et d'accompagnement de personnes éco- anxieuses. L'objectif principal se veut d'apprendre aux personnes inquiètes pour leur futur, à traverser les émotions en lien avec les traumatismes pour dépasser le sentiment d'impuissance et agir face aux difficultés planétaires.

S'agissant d'une souffrance collective, c'est un accompagnement en groupe des traumatismes liés aux problématiques actuelles qui se développent. Ces interventions sont conçues pour être simples et facilement enseignables.

Ces pratiques ont historiquement été pensées par les milieux militants et l'empirisme avant d'obtenir un écho chez les professionnel.les de la santé psychique 6. Par la suite, elles se sont issues de différents courants de la psychologie, dépendantes de l'obédience des intervenant.es.

Ces dispositifs visent également la co- construction du monde de la transition, de nos modes de vie bas carbone, ainsi que l'éclosion de nouveaux imaginaires pour un monde soutenable pour tout le vivant.

Les professionnel.les de la santé étant également parfois éco-anxieux, ces espaces sont pensés pour être des lieux d'échange, d'inter-vision et de formation entre paires «psy».

Résultat

Un réseau de transition se construit avec de plus en plus de professionnel.le.s qui offrent des espaces ayant un socle de pratiques communes et qui intègrent la question du collectif, du vivant et des limites planétaires dans la santé psychique 7. Celui-ci est en constante évolution. Ces dispositifs simples seront amenés à grandir ces prochaines années et remettent en question la compréhension de la prise en charge de la santé mentale; ils soutiennent un changement de paradigme qui adopte une compréhension écologique de la santé. Des formations pour transmettre ce changement commencent à se donner dans les institutions de santé suisses. Ces espaces se créent en fonction des besoins perçus, comme le témoigne, en ce moment, le « Off » de ce congrès; il s'agit d'une volonté d'apporter une autre vision au modèle de santé dominant.

Changement de paradigme

Les atteintes subies au niveau environnemental peuvent être comprises comme un traumatisme collectif que tous les individus partagent et peuvent utiliser comme une force unificatrice pour chercher des solutions afin de faire face à la crise climatique. Comme le propose le graphique ci-dessous, il s'agirait dès lors de prendre en compte la dimension environnementale et du vivant dans nos consultations et cela en plus de la dimension individuelle et familiale.

Conclusion

Au sein des dispositifs groupaux, les pratiques favorisent la dépathologisation de l'individu inquiet par le biais d'un partage d'un vécu similaire. Les interventions semblent dès lors contribuer à la diminution de l'anxiété et des souffrances écologiques. Développer ces pratiques, en collaboration avec les institutions, les écoles, les sphères professionnelles permettrait de soutenir et d'accompagner la population et ainsi de soulager un système de santé déjà mis à rude épreuve.

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Tracking Exposure of Vulnerable Populations to Heatwaves Around the Globe

Jonathan Chambers
University Of Geneva, Geneva, Switzerland

Young children and older persons are especially susceptible to the health risks of high temperatures and heat waves. Work conducted in the context of the Lancet Countdown, tracking progress on health and climate change, applied data science methods to global climate and population data to generate an indicator that tracks with high spatial precision the total number of days adults aged over 65 years and children from birth to 1 year have been exposed to heatwave events across the globe in the past decades. We define a heatwave as a period of at least two days where both the daily minimum and maximum temperatures are above the 95th percentile of their respective climatologies. This reflects the definition from the World Meteorological Organization as well as from the published scientific literature. It aims to capture the health effects of both direct heat extremes (i.e., caused by high maximum temperatures) and the problems associated with lack of recovery (i.e., caused by high minimum temperatures) over persisting hot periods. Results show a steady increase in the person-days of exposure for adults over 65 years, with the last 10 years seeing an annual average of 2.9 billion additional events and 3.1 billion more person-days of exposure (or an average of 4.1 days per person >65 years) in 2020, with respect to the 1986–2005 baseline. For children under one year, there were an estimated 62645 million additional person-days of exposure (4.6 days per child under one year old) affecting this vulnerable group in 2020, compared with baseline years. These findings highlight the rapidly increasing impact of climate change on vulnerable populations around the globe that is happening today and challenge the health community to address climate change, both the mitigation to prevent further rapid increases in risk and adaptation to plan for heatwave emergency situations.

Tracking the Exposure of Vulnerable Populations to Heatwaves Around the Globe

Authors

Jonathan Chambers

University Of Geneva, Geneva, Switzerland

Heatwaves have become more frequent and intense due to anthropogenic global warming and have serious and potentially life-threatening impacts on human health, particularly for people over 65 years old and infants under one year old. A global index tracking the changing exposure of these vulnerable populations was developed for the Lancet Countdown, tracking progress in health and climate change.

Global change in the heatwave vulnerability index over the past four decades.

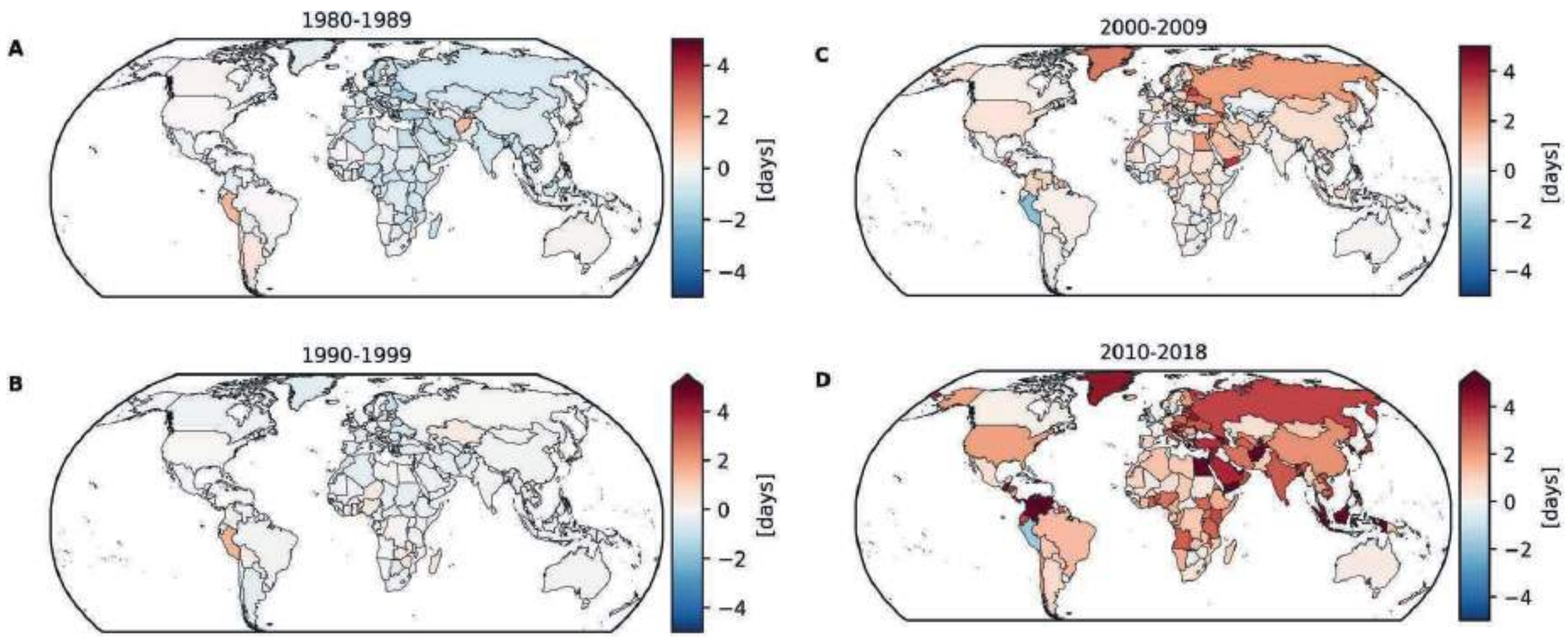

Figure 1. Decadal averages of exposure-weighted change in number of heatwave days relative to 1986-2005, highlighting significant increases in all regions, particularly in the last decade.

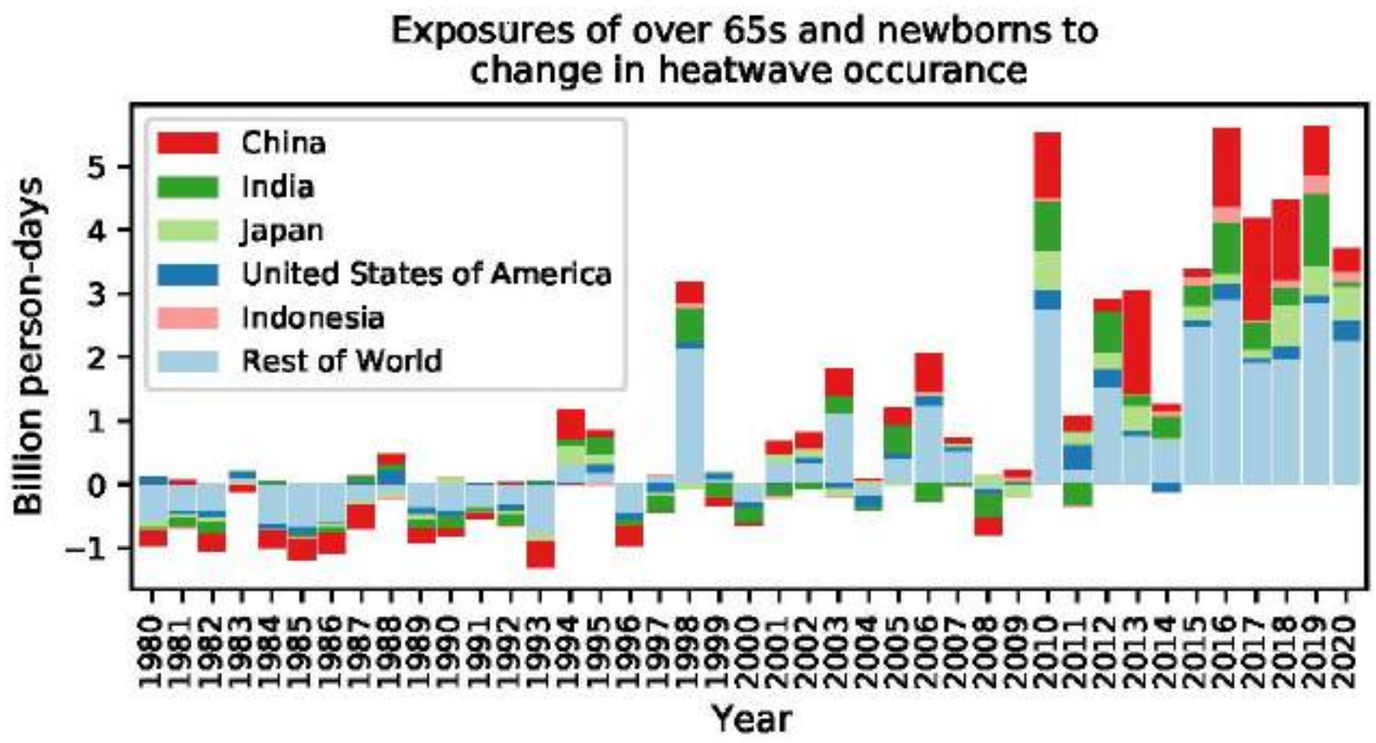

Figure 2. Yearly total of changes in exposures of vulnerable populations relative to baseline, highlighting the five countries with the greatest exposures increases in the past 5 years.

A heatwave was defined as a period of more than two days where the daily minimum and maximum temperatures were both above the 95th percentile of their respective climatologies (for the period 1986-2005). The aim was to capture the effects of both direct heat extremes (caused by high maximum temperatures) and the problems associated with a lack of recovery (caused by high minimum temperatures). The index was calculated for the whole globe, using gridded climate and population data (ERA5, GPW4, ISIMIP).

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Review of Schistosomiasis Spatial Epidemiology in Zambia

Kingford Chimfwembe[1], Hikabasa Halwindi[2], and Christopher Simoonga[3]

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Schistosomiasis in Zambia has been a major public health problem for a long time now. Currently, the estimated prevalence of schistosomiasis in Zambia stands at 26.6 %, with an estimated 2.39 million people infected and another 3 million at risk of getting an infection, though the World Health Organization estimates that those infected could be 4 million. This paper is a systematic review whose main purpose is the application of GIS and RS in schistosomiasis mapping, modeling, and control in Zambia. The review discusses the opportunities and challenges in the use of GIS and RS technologies in Zambia and also proposes future research focus. We carried out a literature search on PubMed, Google Scholar, and EBSCON host using the same combination of terms and Boolean operators used by Simoonga et al. (2009), except that "Africa'' was replaced with "Zambia''. Therefore, the following combination of terms and Boolean operators were entered: "remote sensing" OR "geographical information system" OR ''Remote sensing'' OR "mapping" OR "prediction" AND "schistosomiasis" AND "Zambia". The snowballing technique was also used to review bibliographies or reference lists of previous and similar studies (Kalinda, Chimbari, and Mukaratiwa, 2018). Most publications on GIS and remote sensing in Zambia were between 2008 and 2011, where eight publications (62%) were made compared to the 2012 to 2019 period, which accounted for only five studies (38%). Of the 13 studies that focused on the use of GIS and RS in Zambia, one study merely cited the use of GIS and RS technologies in Zambia. Another study was purely GIS-based, and only the locations of the study sites and other polygon data were shown. The remaining 11 studies used a combination of both GIS and RS technologies. Of the studies that used a combination of GIS and RS technologies, two studies were at the micro-level, one at the macro-level, and the rest were at the meso-level. The potential use of GIS and RS in the modeling, mapping, and control of schistosomiasis in Zambia must be emphasized. More studies on schistosomiasis and snail intermediate hosts at micro-level care are required.

Review of Schistosomiasis Spatial Epidemiology in Zambia

Authors

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Introduction

- The estimated prevalence of Schistosomiasis due to either *Schistosoma haematobium* or *Schistosoma mansoni* in Zambia is 26.6 %; 2.39 million are infected and 4 million are at risk.
- Snail vectors *Bulinus globosus, Bulinus africanus* and *Biomphalaria pfeffeiri* have defined climatic and environmental parameters, and using GIS and RS they can be used in schistosomiasis mapping, modelling and control.

Methods

- We searched PubMed, Google Scholar and EBSCON databases.
- Search criteria: "remote sensing" OR "geographical information system" OR ''Remote sensing'' OR
  "mapping" OR "prediction" AND
  "schistosomiasis" AND "Zambia".

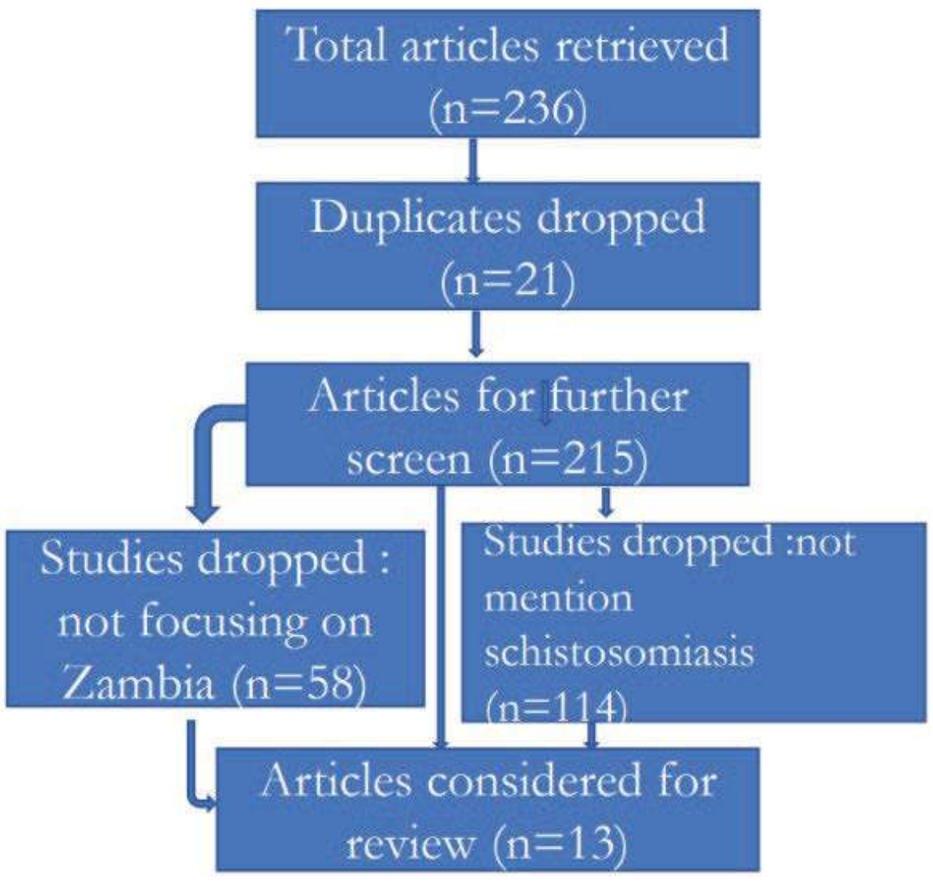

Figure 1: Search criteria.

Results

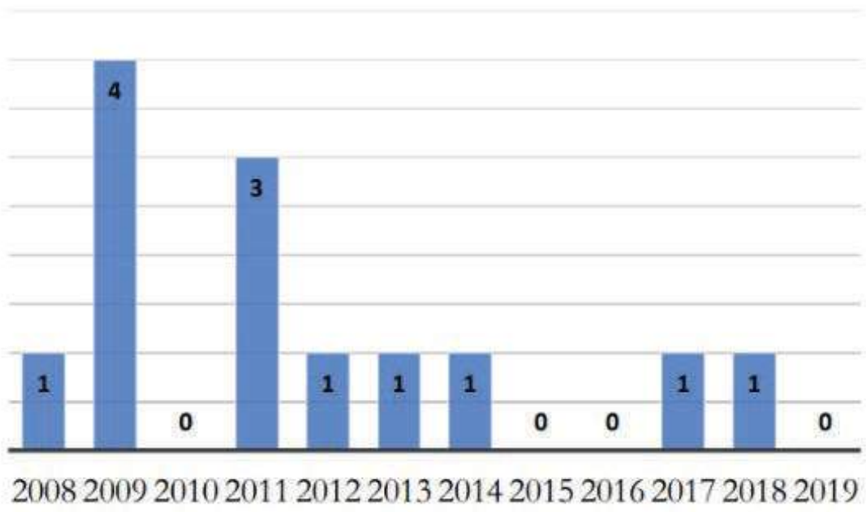

Figure 2: Search results.

- Most publications were published between 2008 and 2011 (8, or 62%), compared to between 2012 and 2019 (5, or 38%).

Discussion

- Spatial epidemiology studies on schistosomiasis in Zambia are still limited.
- More spatial epidemiology studies on schistosomiasis and snail intermediate hosts in micro-level care are required.

Acknowledgements

- This poster was made possible through the contributions of K. Chimfwembe, who developed the concept , while Prof. C. Simoonga and Dr. H. Halwindi provided guidance.

First Detection of Jingmen Tick Virus in Corsica: Development and Validation of a Real-Time Assay to Face a Potential Emergence

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Jingmen tick virus (JMTV) is a new tick-borne segmented RNA virus detected in *Rhipicephalus microplus* ticks in the Jingmen region of Hubei province in China in 2010. The detection of the JMTV genome was described in fatal cases of Crimean–Congo hemorrhagic fever (CCHF) in Kosovo. However, whether or not JMTV causes disease in humans remains unclear. The aim of this study was to develop a rapid diagnostic system for JMTV genome detection and to investigate the circulation of this virus in ticks collected from animals in Corsican (France). A new real-time PCR system was designed and evaluated for the detection of the JMTV group. Ticks collected from domestic and wild animals have been tested with this new diagnostic assay. The complete genome of the virus was sequenced by the NGS method. Infection rates were calculated as the maximum-likelihood estimation (MLE) with 95% confidence intervals (CI). A total of 6,269 ticks collected during 2018–2020 from cattle, horses, wild boars, and sheep were grouped into 1,715 pools of 1-6 ticks.
Jingmen tick virus DNA was detected in 21 tick pools collected from three cattle and one tick pool collected from a sheep. The highest JMTV DNA prevalence (MLE=0.58%, 95% CI: 0.35%-0.6%) was observed for the *Rhipicephalus* genus. *Hyalomma marginatum* and *Rhipicephalus bursa* collected from the same host were detected positive for the JMTV DNA. Sequencing showed that Corsican JMTV strains were closed to Kosovo JMTV strains. This study described the first detection of JMTV in Corsica and more widely in the southwestern Mediterranean and allowed the development of a diagnosis system assay. Future research aimed at defining the origin, ecology, and spillover potential of JMTV will be critical to understanding its relevance to public health.

The First Detection of Jingmen Tick Virus in Corsica: Development and Validation of a Real-Time Assay to Face a Potential Emergence

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Introduction

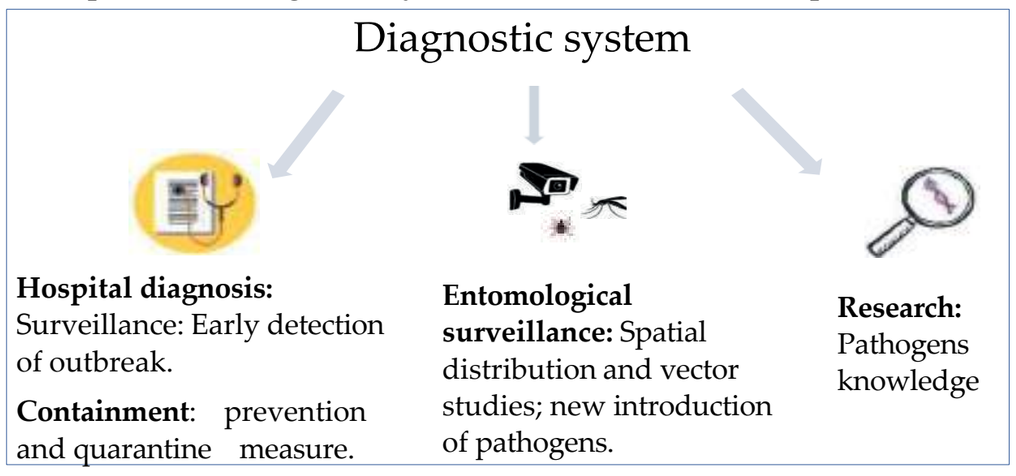
The last ten years have seen a number of public health burdens due to emerging infectious diseases. It is estimated that there are over I billion viruses yet to be discovered. Therefore, investigating the sources of infections to develop surveillance systems and create preparedness and response strategies is crucial for managing future epidemics.

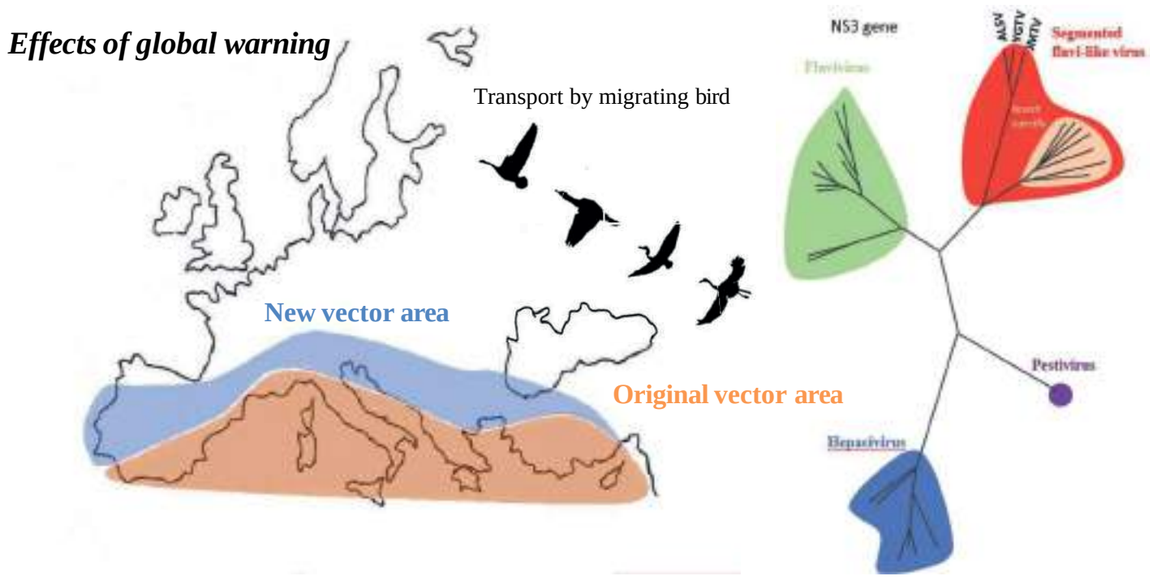
Corsica is a sentinel area for the study of tick-borne diseases. Its geolocation, the presence of avian migration corridors and a warm climate facilitate the emergence of new vector species and associated vector-borne pathogens. Through monitoring vector-borne viral agents on the island and developing rapid diagnostic systems, we can implement preparedness and response strategies for potential epidemics in Europe. A diagnostic system is therefore important for understanding the dynamics of an epidemic as a whole through a One Heath approach.

The Jingmen Tick virus group of new segmented viruses discovered in China is showing worrying epidemiological results. There are a number of clues to its potential as an emerging arbovirosis, including experimental replication and trans-ovarial and trans-stadial passages of the virus in ticks and viremia and virus isolation in humans associated with symptoms.

Recently, JMTV has been detected in many hosts, such as bats, rodents, monkeys and cattle, across the world. The aim of this study is to create a rapid diagnostic system able to detect all viruses of the Jingmen group, and to investigate the presence of the virus in Corsica. This will be achieved by creating a rapid and sensitive detection system for JMTV and carrying out an entomological survey on ticks in Corsica.

Importance of diagnostic systems in the containment of epidemics

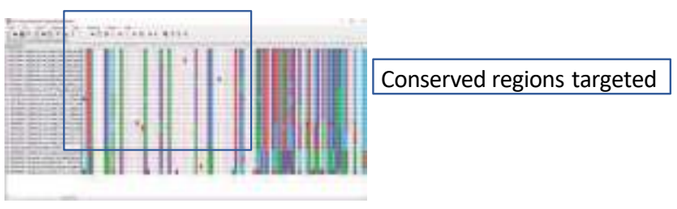




Methods

Design of System

All sequences (67) of the three members of the Jingmen virus group (Jingmen Tick virus, Alongshan Tick virus and Yanggou Tick virus) were aligned and an RT- qPCR detection system was designed to detect all strains of the three virus species.

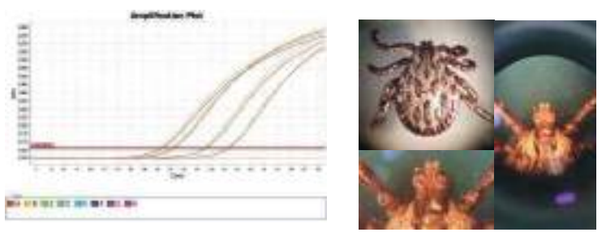


Tick collection

Ticks were collected from cattle in slaughterhouse, (Hunting season) from wild boars and Hunting season) and from horses farm and with flag through island.

Detection in ticks and complete genome sequencing

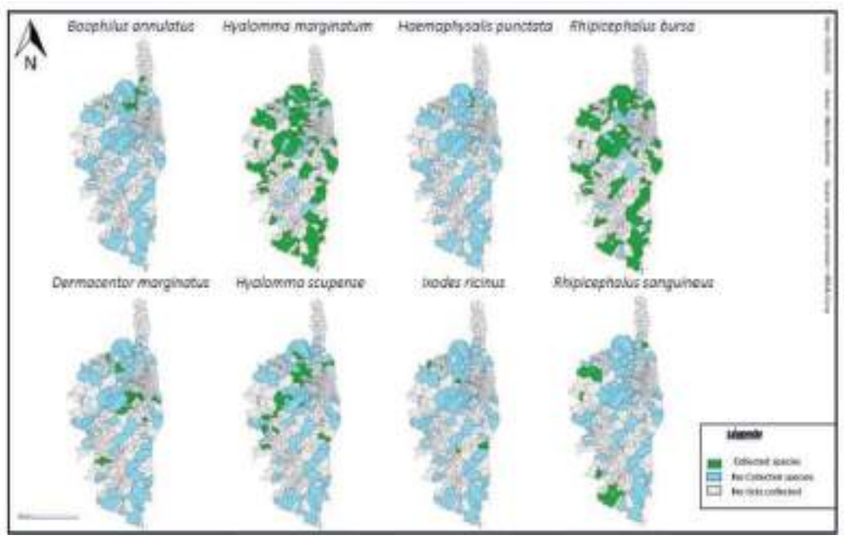
Once the detection system is validated with artificial ARN T+, ticks are tested and positive samples were used for Next Generation Sequencing.



Results-Discussion

Tick collection

Species collected by host (n;%) :
Rhipicephalus bursa (2,978; 47)
Hyalomma marginatum (2,074; 33)
Rhipicephalus sanguineus (101; 2)
Haemaphysalis punctata (14; 0.2)
Ixodes ricinus (75; 1.2)
Hyalomma scupense (282; 4.5)
Boophilus annulatus (130; 2.1)
Dermacentor marginatus (615: 10)



Detection Jingmen Tick virus in ticks

Rhipicephalus bursa	MLE: **0.58%** OD(0.35-0.9)
*Hyalomma marginatum**	MLE: **0.19%** OD(0.06-0.45)
Rhipicephalus sanguineus	MLE: **0.55%** OD(0.03-2.41)

MLE: estimates prevalence and confidence limits for varying pool sizes with α=0.05

**H. marginatum* positive were always associated with *R. bursa* positive on the same host.

CO-FEEDING ?

Phylogeny of Corsican Jingmen Tick virus

The Corsican JMTV is close to the Mediterranean JMTV strains and in particular to the human strain from Kosovo. Not surprisingly, the JMTV strains form clusters by geographical area (China, Brazil, Mediterranean) rather than by host (ticks, bats, rodents).

Equitable Access to Healthy Diets: Nutrition-Based Interventions of the Healthy Life Project and Trends in Dietary Risk Factors in the Republic of Moldova

Ala Curteanu[1,2], Constantin Rîmis[1], Meike Zuske[3,4], Cristina Rotaru[1], Carolyn Blake[3,4], Leah Bohle[3,4], Florence Sécula[3,4], and Helen Prytherch[3,4]

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[2] Mother and Child Institute, Chisinau, Moldova
[3] Swiss Centre for International Health, Swiss Tropical and Public Health Institute, Basel, Switzerland
[4] University of Basel, Basel, Switzerland

Global transformation processes are affecting human life and the shape of our planet. Rural areas are decaying while cities are expanding, and the gap between rich and poor is widening. Against these challenges, there is an increase in non-communicable diseases (NCDs) linked to dietary risk factors. We place special focus on the nutrition-based interventions of the Healthy Life Project, established in the Republic of Moldova in 2017, to combat NCDs and improve population health. The project has built capacities in public health, health promotion, and risk reduction: local government and community-led actions linked to nationwide campaigns addressing the high levels of salt and trans fat consumption, reducing sugar intake, and promoting intake of fruit and vegetables. The exchange has been facilitated between supermarkets, food producers, and public health experts to influence national regulations on salt levels. To measure trends related to dietary and other risk factors, a controlled trend study using the Knowledge, Attitudes, and Practices survey method was conducted in 2017 and 2020. Data were collected in 10 intervention and 10 control districts. A total of 930 and 945 respondents participated in the surveys in 2017 and 2020, respectively. More respondents consumed industrially produced foods and salty snacks, as well as sugary foods and drinks only occasionally or never (from 69% in 2017 to 74% in 2020, as well as from 37% in 2017 to 43% in 2020, respectively). Knowledge about the harms of trans fats was higher in women (85% compared to 71% in men) and in respondents between 45 and 69 years of age (80% compared to 77% in younger participants).

The consumption of fruits and vegetables increased (from 64% in 2017 to 71% in 2020 and from 68% in 2017 to 80% in 2020, respectively). In 2020, nearly 30% of respondents had no access to fruits and vegetables in all seasons, especially in the older age group and in participants with an NCD. Although some positive trends are identifiable, the question of equitable access to healthy food becomes pivotal. Strategies to promote and strengthen local markets, as well as innovations of delivery to vulnerable groups, need to be developed.

Equitable Access to Healthy Diets: Nutrition-Based Interventions of the Healthy Life Project and Trends in Dietary Risk Factors in the Republic of Moldova

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Introduction

Global transformation processes are affecting human life and the shape of our planet. Rural areas are decaying while cities are expanding. and the gap between rich and poor is widening. Against these challenges. there is an increase in non-communicable diseases (NCDs) linked to dietary risk factors. We place special focus on the nutrition-based interventions of the Healthy Life Project. established in the Republic of Moldova in 2017 to combat NCDs and improve population health.

Methods

The project has built capacities in public health, health promotion and risk reduction:

Local government and community-led actions linked to nationwide campaigns addressing the high levels of salt and trans fat consumption, reduce sugar intake and promote intake of fruit and vegetables.

Exchange has been facilitated between central authorities. supermarkets. food producers and public health experts. to influence national regulations on salt and trans fat levels.

Educational activities to promote healthy food in the Health Promotion Schools. during the local level awareness campaigns on reducing consumption of salt and trans fats. were implemented.

To measure trends related to dietary and other risk factors, a controlled trend study using the Knowledge, Attitudes and Practices survey method was conducted in 2017 and 2020. Data was collected in IO intervention and IO control districts 930 and 945 respondents participated in the surveys in 2017 and 2020 respectively.

Proportion of respondents consuming fruits and vegetables daily and proportion of respondents with no access to fresh fruits and vegetables

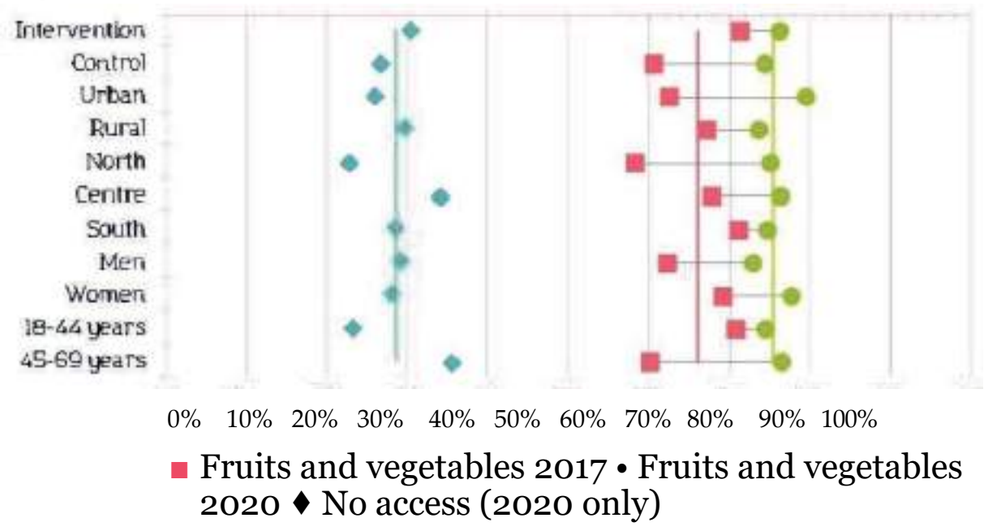

Figure 1. Selected results of the Knowledge, Attitudes and Practice surveys 2017 and 2020.

Example 1: Video spot of the salt reduction campaign, 2019.

Example 2: Healthy food choices campaign. 2020.

Results

More respondents consumed industrially produced foods and salty snacks. as well as sugary foods and drinks only occasionally or never (from 69% in 2017 to 7 4% in 2020. as well as from 37% in 2017 to 43% in 2020, respectively). Knowledge about the harms of trans fats was higher in women (85% compared to 71% in men). and in respondents between 45-69 years of age (80% compared to 77% in younger participants) The consumption of fruits and vegetables increased (from 64% in 2017 to 71% in 2020, and from 68% in 2017 to BO % in 2020, respectively) (Figure 1). In 2020, nearly 30% of respondents had no access to fruits and vegetables in all seasons (Figure 1). especially in the older age group and in participants with an NCO.

Conclusion

Although some positive trends are identifiable. the question of equitable access to healthy food becomes pivotal. Strategies to promote and strengthen local markets. as well as innovations of delivery to vulnerable groups. need to be developed.

Proiect Viata sanatoasa

Schweizerische Eidgenossenschaft
Confédération suisse
Confederazione Svizzera
Confederaziun svizra
Swiss Agency for Development and Cooperation SDC
Agenția Elvețiană pentru Dezvoltare și Cooperare
Швейцарское управление по развитию и сотрудничеству

MINISTERUL SANATATII AL REPUBLICII MOLDOVA

SwissTPH
Swiss Tropical and Public Health Institute
Schweizerisches Tropen- und Public Health-Institut
Institut Tropical et de Sante Pubtique Suisse
Associated Institute of the University of Basel

Teaching Planetary Health at the Faculty of Medicine of Geneva: A Student-Led Initiative

Cora Greipl, Estelle Delamare, Leo Peterschmitt, Johanna Sommer, and Yves-Laurent Jackson
Faculty of Medicine, University of Geneva, Geneva, Switzerland

Climate change could cause 250,000 additional deaths per year between 2030 and 2050, making it one of the significant public health issues and forcing healthcare systems to adapt. Currently, no specific training is integrated into the pre-graduate medical curriculum in Geneva. This project, initially led by students and supported by the medical faculty and teachers, aims to set up a longitudinal curriculum in planetary health. The project included several components: a) an online questionnaire on the faculty's students' knowledge of the links between health and the environment and b) an analysis of the pre-existing curriculum to identify courses related to planetary health, as well as the PROFILES catalog of training objectives. A total of 240 (18%) students responded to the questionnaire. The results showed that 13.3% of them thought they were sufficiently informed about the links between health and the environment and that over 80% would find it useful to introduce teaching on this topic. Analysis of the curriculum identified 23 courses with learning objectives related to global health but which were not cited as such. What is more, the issue of climate change is never addressed in the curriculum.

These facts prompted the Dean's Office to set up a joint working group of students and teachers, which defined some thirty learning objectives labeled "planetary health" and to integrate a new "planetary health" longitudinal curriculum into the pregraduate medical studies, addressing 3 main targets: 1. Threats to human health from climate change and global changes, 2. Environmental impact of the health system and the adaptations to be implemented, 3. Role of the physician in addressing these threats: prevention and health advocacy. Discussions within the various faculty committees have also helped raise awareness of this theme among many teachers. This innovative collaboration between teachers and students on an emerging planetary health theme has enabled us to rapidly adapt medical teaching in Geneva. Our next objectives are to continue updating and integrating the formulated objectives and to collaborate with other Swiss medical faculties to invite them to set up similar projects.

Teaching Planetary Health at the Faculty of Medicine of Geneva: A Student-Led Initiative

Authors

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Faculty of Medicine, University of Geneva, Geneva, Switzerland

Context

- The FMH (*Swiss Medical Association*) has been committed since October 2021 to the sustainable integration of Planetary Health (PH) into pre- graduate curricula throughout Switzerland [1];
- According to the AMEE (*Association for Medical Education in Europe*) Consensus [2], universities should incorporate sustainability as a cross-cutting curriculum theme across all health professions education by 2025;
- The PROFILES [3], a set of competencies to be acquired by Swiss medical students during their pre-graduate training, target the following goal: *"Contribute to the literacy of patients and oneself regarding environmental and ecological safety";*
- A coherent teaching for all medical students is therefore needed to achieve these objectives.

Methodology

- February 2020: student survey to evaluate their needs and wishes.
- Only 10% believe they have sufficient knowledge of the links between climate change and health.
- January 2021: systematic review of the learning objectives already present in the curriculum using the LOOOP tool.
- (Learning Opportunities, Objectives and Outcomes Platform)
- April 2021: creation of a working group between teachers and students mandated by the deanship.

Results

- Development of a curriculum in PH, starting in September 2021 and addressing three main targets: (i) Threats to human health from climate change and global changes, (ii) Environmental impact of the health system and the adaptations to be implemented, and (iii) Role of the physician in addressing these threats: prevention and health advocacy.
- During 2021-22: integration of about 30 new learning objectives and 3 new lectures for Bachelor's students.
- Spring semester 2022: dedicated PH elective course in collaboration with Lausanne and Geneva Universities for 10 Bachelor students, 3h per week.

Discussion

- May 23rd 2022: Official presentation of the PH teaching at a public conference.
- 2022-23: Integration of new objectives, mainly for Master's students.
- From 2022: Extension of the project to other faculties in the University of Geneva.
- From 2022: Participation in the *Planetary Health Report Card* [4] to evaluate the 7 medical faculties in Switzerland, in collaboration with *Health for Future* [5] (student's national group) to track progress in implementing PH teaching.

Perspectives

- PH is an emerging and essential component of pre- graduate medical education
- Student-led initiatives, supported by faculties, can lead to rapid adaptations of the medical curriculum
- Embedding teaching activities into pre-existing courses facilitates the integration of learning objectives
- Cooperation between Universities is key for maximizing the impact on education

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Addressing COVID-19 in the Arctic: Lessons from Indigenous Communities in Alaska

Michele Devlin, Andrey Petrov, Mark Welford, Tatiana Degai, John DeGroote, Stanislav Ksenofontov, Nikolay Golosov, and Nino Mateshvili
University of Northern Iowa ARCTICenter, Cedar Falls, United States

The Arctic region as a whole is home to approximately 4 million people in eight countries. Indigenous populations in this extreme terrain comprise a minority of the residents in the circumpolar area globally but are among the most adept and resilient at surviving extremely demanding conditions. The global COVID pandemic has brought unique challenges to these native populations in already harsh Arctic environments. Although the experiences of Indigenous populations are often left out of social science research, these native groups have much to share with the world. For example, since the start of the COVID pandemic, many native populations have experienced disproportionately high rates of morbidity and mortality from this disease due to unique geographic, cultural, financial, political, social, and other barriers to care. However, others have been quite effective in adopting a number of culturally appropriate policies and programs to mitigate the harm that COVID can bring to their communities. For example, a number of Indigenous organizations in Arctic regions have developed deliberate, culturally appropriate strategies to address COVID. The University of Northern Iowa ARCTICenter conducted a literature review of publicly available news articles, media reports, and press releases that shared the experiences of native populations in Alaska in addressing the COVID pandemic. This poster presentation provides a number of culturally appropriate strategies utilized by tribal organizations in the American Arctic to address this infectious disease outbreak. Policies such as prioritizing the health needs of elders, utilizing community health aides in rural villages as pandemic prevention partners, promoting native language storytelling about the disease, and supporting teams of outreach nurses to provide vaccinations in remote areas are but a few of the numerous lessons that many Alaskan native groups can teach other Arctic communities faced with keeping their populations safe from COVID.

Addressing COVID-19 in the Arctic: Lessons Learned from Indigenous Communities in Alaska

Authors

Michele Devlin, Andrey Petrov, Mark Welford, Tatiana Degai, John DeGroote, Stanislav Ksenofontov, Nikolay Golosov, and Nino Mateshvili

University of Northern Iowa ARCTICenter, Cedar Falls, United States

Abstract: Indigenous populations around the world are among the most vulnerable to the COVID-19 pandemic, and many Native communities have experienced disproportionately high morbidity and mortality rdaut e to the disease. These disparities have occurred, in part, due to language barriers, limited political power, insufficient sovereign rights, restricted control over resources, lack of culturally specific programming, higher levels of predisposing conditions such as respiratory conditions and diabetes, geographic isolation, dense housing, communal practices, and other factors. However, some Indigenous communities have been models of resiliency and tribal teamwork in fighting COVID- 19, so that the disease would not have the same deadly impact that tuberculosis, smallpox, and influenza had in their midst in earlier generations. Due to their extreme remoteness and often limited resources, Arctic indigenous populations have been particularly active in implementing creative strategies to mitigate COVID-19. The analysis of COVID-19 related strategies shows that within the Arctic region of Alaska, US, many Indigenous communities have adopted a variety of programs and policies and engaged Indigenous knowledge to control and respond to the spread of COVID-19 in their villages, making some communities more resilient to the pandemic than others. This experience could be useful for other regions and future pandemics. *This research is supported by NSF grant # 2034886.*

Study Goals and Objectives

- Examine strategies utilized by Alaska communities to address the COVID-19 pandemic.
- Identify lessons learned in Alaskan communities applicable to other remote locations and Indigenous communities.

Methods

We conducted a review of secondary data from Alaskan health department websites, newspapers, tribal policy statements, and other public sources. We also collected data on COVID-19 infections, deaths, vaccinations, and health- related socioeconomic variables for Alaskan regions.

Findings: Key Implemented Strategies

- Coupled healthcare sovereignty and Indigenous knowledge;
- Culturally appropriate prevention information that emphasized protecting tribal elders from COVID-19 provided;
- Historic importance of the role of individuals in protecting the broader community through preventing disease transmission encouraged;
- Community radio stations utilized to reach remote areas with multilingual Indigenous language COVID-19 messaging;
- Posted tribal-specific posters with COVID-19 public health information in areas of high village traffic, including markets, schools, churches, community centers, and airports;
- Brought COVID-19 vaccination teams directly to native villages and homes by multiple methods, including cars, snow machines, dogsleds, fishing boats, and bush planes;
- Developed systemic partnerships with Alaska Tribal Health Organizations, tribal councils, key hospitals, borough public health departments, and the state Community Health Aide program to provide village medical care, stabilization, vaccinations, and/or medevac services for COVID-19 patients in remote areas;
- Mandated COVID-19 testing before flying and instituted travel bans for COVID-19 positive individuals between villages;
- Required quarantines for COVID-19-positive patients;
- Implemented curfews, required masking, eliminated public gatherings in many villages;
- Conducted school, church, tribal business, and other village operations through virtual methods such as zoom meetings and live streaming;
- Utilized traditional forms of information sharing such as storytelling, dance, song, art, and other methods to encourage community resilience during times of hardship;
- Continued prioritizing the health and well-being of the Elders/knowledge keepers;
- Continued safeguarding the environment/biodiversity;
- Continued and emphasized practicing traditional activities;
- Continued relying on living off the land, including time spent on the land for self- isolation and spiritual rehabilitation.

OVERALL RESPONSE FRAMEWORK
DELAY ➔ PREPARE ➔ RESPOND/
INDIGENOUS KNOWLEDGEENGAGE

A successful response framework in the Alaska indigenous communities has been to (1) delay the onset of the pandemic by strict isolation and prevention measures; (2) prepare for the arrival of the disease by relying on the Alaska Native Health System; and (3) respond to the pandemic by coupling a self-governed health system with Indigenous knowledge, including by holistically addressing health through community, spiritual, and traditional cultural lenses.

Conclusions

Arctic Indigenous communities in Alaska frequently adopted diverse strategies to manage the pandemic in their communities that likely mitigated the impact that COVID-19 could have had on their communities. With the growing reality that climate change, human migration, urbanization, and globalization will likely increase the frequency and severity of novel pandemics around the world, the strategies used by Arctic Indigenous populations to mitigate COVID-19 can provide important lessons for other populations faced with extreme vulnerability to infectious diseases.

ARCTIC COVID19 NSF ARCTICenter UNIVERSITY OF NORTHERN IOWA

Successfully Controlling COVID-19 and Herpes Zoster with Ayurvedic Medicine

Subhas Chandra Dutta and Subhyendu Maity
J.B Roy State Ayurvedic Medical College and Hospital, Kolkata, West Bengal, Kolkata, India

Ayurvedic practitioners all over India are successfully treating viral diseases with clinical and laboratory evidence. Though herpes and hepatitis B are double-stranded DNA viruses, hepatitis C and COVID-19 are both single-stranded RNA viruses. As we can minimize the viral load of hepatitis C with Ayurvedic medicines, the viral load of COVID-19 may also be minimized. A total of 24 cases of herpes zoster, diagnosed clinically, have been collected from the Outdoor Dept of our Institute, and 8 cases of COVID-19 have been collected from private clinics, diagnosed by RT-PCR test. Herpes zoster cases have been treated with generic Ayurvedic medicines, Laxmivilas, Vatagajankush, Dhatri louha, and application of honey for 5-10 days, and COVID-19 patients have been treated with Swas-kas-Chintamani, Mahalaxmivilas, Swasari louha, and Dasamularista for 14 days and more. All patients of herpes Zoster felt subsiding pain, burning sensation, and further aggravation, and lesions dried up within 10 days. Among COVID-19 patients, two patients discontinued the treatment regime and left for allopathic medicine, whereas six patients continued ayurvedic medicines, and features like violent dry cough, loss of smell sensation, fever, low oxygen saturation, severe weakness, etc., subsided earlier in comparison to COVID-19-positive relatives of those patients, taking allopathic medicines. All six patients were RTPCR negative after 14 days and rehabilitated to normal life earlier. Ayurvedic medicines are remarkably effective and cost-effective (1/50th expenditure in comparison to allopathic medicines) against viral infections in immuno-compromised patients with little/no complications. It is important to trust in the potency of Ayurveda and explore it to achieve Planetary Health or One Health approaches into healthcare systems cost-effectively at the earliest.

Successfully Controlling COVID-19 and Herpes Zoster with Ayurvedic Medicine

Authors

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Keywords

Ayurveda (traditional medicines of India): Laxmivilas, Sutasekhar, Dhatri louha, Swasari louha, Swas-kas-chintamani, etc.; generic ayurvedic medicines; Hepatitis-C; COVID-19; Herpes Zoster

Introduction

- Ayurvedic practitioners all over India are successfully treating viral diseases with clinical and laboratory evidence. Herpes and Hepatitis B are double-stranded DNA viruses, but Hepatitis C and COVID-19 are both single-stranded RNA viruses. As we can minimise the viral load of Hepatitis C using Ayurvedic medicines, the viral load of COVID-19 may also be minimised by the same method.

Methodology

- A total of 24 cases of Herpes Zoster, diagnosed clinically, were collected from the Outdoor Dept of our Institute, and eight cases of COVID-19 were collected from private clinics, diagnosed using RTPCR tests. Herpes Zoster cases were treated with generic Ayurvedic Medicines, Laxmivilas, Vatagajankush, Dhatri louha and the application of honey for 5-10 days. COVID-19 patients were treated with Swas-kas-chintamani, Mahalaxmivilas, Swasari louha and Dasamularista for 14 days or more.

Results and Discussions

- All patients with Herpes Zoster experienced subsiding pain, a burning sensation and further aggravation and lesions, which dried up within 10 days. Among COVID-19 patients, two patients discontinued the treatment regime and changed to allopathic medicine, whereas six patients continued with ayurvedic medicines and symptoms like a violent dry cough, loss of smell, fever, low oxygen saturation, severe weakness, etc., subsided earlier in comparison to the COVID-19 positive relatives of those patients, who were taking allopathic medicines. All six patients were RTPCR negetive after 14 days and rehabilated to normal life earlier. Ayurvedic medicines are remarkably effective and cost effective (1/50th expenditure in comparison to allopathic medicines) compared to viral infections in immuno- compromised patients with little/no complications.

Conclusions

The potency of Ayurveda has been explained and it can be explored to achieve Planetary Health or One Health approaches in health care systems cost effectively.

Community Leader Participation to Idenitfy People with Disabilities Unable to Reach Mobile Vaccination Centers in the Piliyandala MOH Area, Colombo, Sri Lanka

Indika Ellawala
Office of Medical Officer of Health, Piliyandala, Kalubowila, Sri Lanka

Vaccination coverage for the population over the age of 60 was given priority in Sri Lanka at the initial stages of the vaccination process. After we achieved 90% of coverage from this category, it was evident that there were bedridden and disabled people who were unable to visit the vaccination centers. The main objective of this work was to identify these unvaccinated people with the support of village-level community leaders.
This group of people was quite familiar with the village setup and was able to easily reach each and every family in the village to identify non-vaccinated people for this initiative. Stakeholder discussions were done with the Divisional Secretary and police officers of the area. Identified community leaders were empowered regarding the objective. They were given a target to identify non-vaccinated elderly people and collect their data and contact details. Village-level community leaders, with the help of their subordinates, carried out surveys to identify non-vaccinated people in the village, and public announcements were made to register the non-vaccinated elderly people. After gathering the required data, an action plan was developed for a mobile vaccination program in the area. With the district and provincial level support, we were able to arrange ambulances and emergency treatment equipment. Registration processes were carried out with the help of tri-forces and village-level government officers, and police officers accompanied the health team during these programs. Altogether, six mobile vaccination programs for elderly homes and bedridden and disabled people (door-to-door mobile vaccination) were conducted. During this special program, 217 vaccinations were performed in elderly homes in the area, and 165 home visits were done for mobile vaccination. Contribution of the local political members of the council and the community leaders supported immensely vaccinating several people who were otherwise unable to attend the vaccination clinics. This program was greatly appreciated by the public. Village-level leaders proved to be an effective asset in identifying people with special needs, and eventually, this strategy minimized unnecessary time waste and waste of resources.

Community Leader Participation to Identify People with Disabilities Unable to Reach Mobile Vaccination Centers in the Piliyandala MOH Area, Colombo, Sri Lanka

Authors

Indika Ellawala

Office of Medical Officer of Health, Piliyandala, Kalubowila, Sri Lanka

Introduction

Vaccination coverage for the population over the age of 60 was given priority in Sri Lanka at the initial stages of the vaccination process. After we achieved 90% coverage from this category, it was evident that there were bedridden and disabled people who were unable to reach the vaccination centers. The main objective of this work was to identify this unvaccinated category with the help of village-level community group leaders. This group of people was quite familiar with the village setup and were able to reach each and every family in the village to easily identify non-vaccinated people for this initiative.

Methodology

Stakeholder discussions were carried out with the Divisional Secretary of the area and Police Officers in this area. Identified group leaders were empowered for this work. They were given a target of identifying non-vaccinated elderly people and collecting their data and contact details. Village-level community leaders, with the help of their subordinates, carried out surveys to identify non-vaccinated people in the village and public announcements were made to register non-vaccinated elderly people.

After gathering the required data, an action plan was developed for a mobile vaccination programme in the MOH area. With the help of District and Provincial level support, we were able to arrange ambulances and emergency treatment equipment. Registration processes were carried out with the help of tri-forces and village-level government officers accompanied the health team during these programmes. Altogether, six mobile vaccination programmes were implemented for elderly, bedridden and disabled people (house-to-house mobile vaccination).

Results and Discussion

During this special programme, 217 vaccinations were performed in the homes of the elderly in our MOH area and 165 home visits were carried out for mobile vaccination. Local political members of the council and community leaders' huge contributions helped immensely in vaccinating many people who were unable to attend vaccination clinics. This programme was greatly appreciated by the public.

Conclusions

Village-level group leaders proved to be very effective in identifying people in special need, and eventually this strategy minimized the unnecessary waste of time and resources.

Community Participation in Improving COVID-19 Vaccination Programs and Testing Facilities in the Piliyandala MOH Area, Colombo, Sri Lanka

Indika Ellawala
Office of Medical Officer of Health, Piliyandala, Kalubowila, Sri Lanka

Considering the current COVID-19 situation in Sri Lanka, testing facilities for early detection of new COVID-19 cases and vaccination programs were the utmost priorities in order to prevent the spread of the disease.
As continuous public vaccination programs are carried out to reach healthcare goals within the country, our target was to perform more than 1000 vaccinations per day. One of the major objectives of this project was to receive community participation to upgrade facilities for people who are visiting for vaccination and develop a friendly atmosphere to perform testing for COVID-19 while ensuring the safety of healthcare workers. With the support of the community, the car park of the health institution was converted into a vaccination area.
One of the major concerns identified was the possible effects of rain and heat. Thus, a long-term permanent tent was built in order to make the vaccination visit more comfortable for the people.
In addition, the establishment of an end-to-end process for the safe conduct of PCR and RAT to diagnose COVID-19 while ensuring the safety of healthcare personnel involved in the procedure was required. The members of the community voluntarily supported the healthcare team in building a novel, innovative container to perform testing for COVID-19 with their guidance. This unique product developed to perform PCR and RAT ensured the safety of the healthcare personnel, and this container can be utilized for mobile testing as well. Conducting outdoor vaccination for the public on rainy days was not disturbed due to the new modification. Up to now, 128,033 doses have been performed at this center. This is also supported by arranging drive-through vaccination for those who are unable to walk. This outdoor setup was appreciated by the public as it reduced the waiting time, contact with others, and transmission of communicable diseases.
By utilizing the new container, more than 10,000 PCR tests and more than 4,000 RATs were performed.
Overall, this futuristic method enabled a methodical order in performing tests. Active involvement of the community supported improving the quality of health services provided.

Community Participation in Improving COVID-19 Vaccination Programs and Testing Facilities in the Piliyandala MOH Area, Colombo, Sri Lanka

Authors

Indika Ellawala

Office of Medical Officer of Health, Piliyandala, Kalubowila, Sri Lanka

Introduction

Due to the prevailing COVID-19 situation in the country, COVID-19 vaccination programmes and testing facilities for the early detection of new cases were the utmost priorities during this period. As continuous public vaccination programmes are being carried out to reach healthcare goals within the country, we had to perform more than 1000 vaccinations per day. One of the major objectives of this project was to gain community participation to upgrade facilities for people who are coming for vaccination, developing a friendly atmosphere in which to perform testing for COVID-19 and ensuring the safety of healthcare workers.

Methodology

With the help of the community, we wanted to rearrange the car park area into a vaccination area. One of the major concerns we found was the effects of rain and heat. Thus, a long-term permanent tent was built, making the vaccination journey a more comfortable one for people.

We also wanted to arrange an end-to- end process to safely conduct PCR and rapid antigen tests to diagnose COVID- 19, ensuring the safety of healthcare personnel involved in the procedure. The community group willingly supported our team to build a new innovative container to perform testing for COVID- 19 with the guidance of the healthcare sector. This unique product was developed to perform PCR and RAT tests ensured the safety of the healthcare personnel, as this container could be utilized for mobile testing as well.

Results and Discussion

The new modification allowed outdoor vaccinations for the public to continue undisturbed on rainy days. To date, 128,033 doses have been administered in this center. It also helped in arranging drive-through vaccination for those who are unable to walk. This outdoor setup was appreciated by the public as it reduced the transmission of communicable diseases. By utilizing the new container, more than 10,000 PCR tests and more than 4,000 RATs were carried out. Overall, this futuristic method enabled methodical order when testing.

Conclusions

Gaining the active involvement and support of community groups whenever needed will always help in improving the quality of health services provided.

The Active Contribution of Mothers' Support Groups in Increasing Well Woman Clinic Attendance in the Target Group (Age 35) from 24% to 70% During the New Normal Period in the Piliyandala MOH Area from October to December 2021

Indika Ellawala
Office of Medical Officer of Health, Piliyandala, Kalubowila, Sri Lanka

Well-Woman clinics play an important role in the early detection of NCDs, especially breast and cervical cancer among females. The target population for the clinic is the 35 age cohort. Due to the prevailing COVID-19 situation in the country, Well-Woman clinic coverage for this birth cohort was adversely affected. The main objective of this initiative was to improve the Well-Woman coverage by up to 55% by the end of this year. Medical officers, the Public Health Nursing Sister, and the team analyzed the data up to September 2021 and decided on achievable targets for the public health midwives (PHM) of the area. Gaps were identified, and tasks were given to each PHM to achieve maximum coverage. The main strategy was to increase the coverage by community empowerment through mother-support groups. Since mother-support groups were available in every village, the plan was to utilize the trust and credibility they had developed to increase
Well-Woman coverage. Details about the targeted group of females were obtained from the government agents. The relevant messages were then disseminated via mother-support groups. Mothe-support group members distributed leaflets and shared information about the importance of undergoing the well-woman screening. Tele-counseling of clients and their partners was also done by healthcare workers and mother-support group members. Community-level discussions organized by mother-support groups via Zoom helped to empower the target group. In addition, outreach special clinics and Sunday clinics were organized as well. Continuous monitoring and evaluation of the performance of PHMs was done in a regular manner. Well-woman coverage of age 35 cohort females increased from 24% at the beginning of October to 59% by the 10th of December 2021. This remarkable achievement in a very short period was achieved due to the involvement of mother-support groups at the village level. Mother-support groups turned out to be a really good strategy for improving the Well-Woman clinic attendance, which was adversely affected due to
COVID-19.

The Active Contribution of Mothers' Support Groups in Increasing Well Woman Clinic Attendance in the Target Group (Age 35) from 24% to 70% During the New Normal Period in the Piliyandala MOH Area from October to December 2021

Authors

Indika Ellawala

Office of Medical Officer of Health, Piliyandala, Kalubowila, Sri Lanka

Introduction

The Well Woman clinic is very important in the early detection of NCDs, especially breast and cervical cancer among the women. The 35 year old age cohort was given as the target population for public health midwives. Due to the prevailing COVID-19 situation in 2021, Well Woman coverage for this birth cohort was severely altered. The main objective of this initiative was to improve Well Woman coverage up to 70% by the end of this year.

Methodology

Medical officers, Public Health Nursing Sisters and the team analyzed the data up to September 2021 and decided upon achievable targets for the public health midwives. Gaps were identified and tasks were given were given for each midwife to achieve maximum coverage by the end of the year. The main methodology decided on by the team was to increase Well Woman coverage through community empowerment via mothers' support groups.

Since every public health midwife has community groups in every village, which they are closely associated with, we planned to use the trust and credibility they have developed with these groups to increase Well Woman coverage.

After obtaining details about the targeted group of women from the government agents, we began disseminating messages via mothers' support groups to find target group women for the Well Woman clinics.

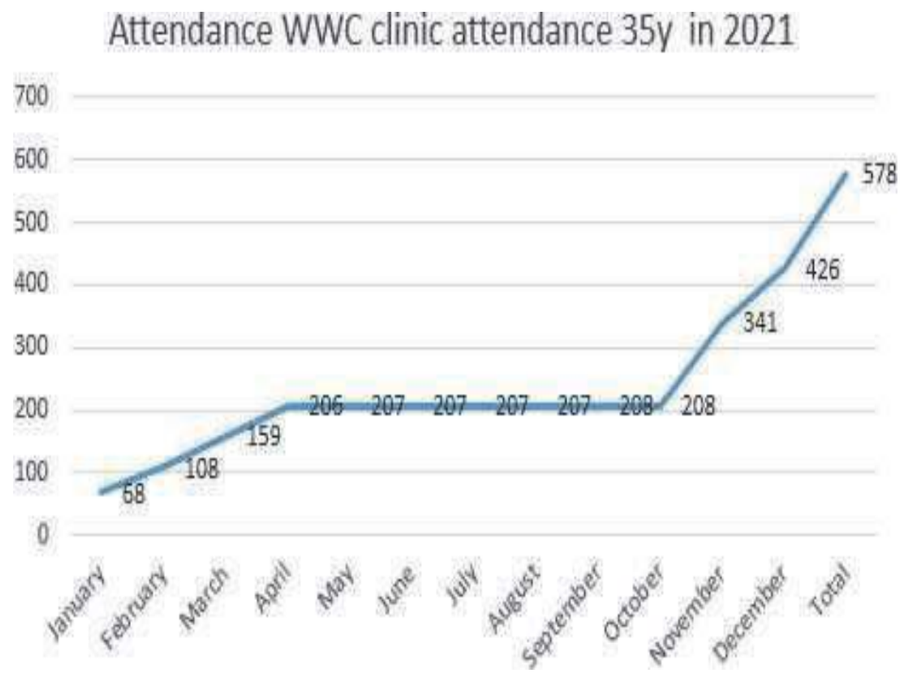
Mothers' support group members distributed leaflets and shared information about the importance of Well Woman screening. Tele counseling of clients and their partners was also undertaken by healthcare workers and mothers' support group members. clients and their partners was also undertaken by healthcare workers and mothers' support group members.

Community level discussions organized by mothers' support groups via zoom helped to empower the target group. According to the mothers' group suggestions, special outreach clinics and Sunday clinics were organized.

The continuous monitoring and evaluation of the performance of public health midwives was carried out in a regular manner. We arranged appreciations for the best performances at the beginning of this year.

Results and Discussion

The Well Woman clinic coverage of women in the age 35 cohort increased from 24% at the beginning of October to 70% by the 31st of December 2021. This remarkable achievement in such a short amount of time was achieved via the involvement of mothers' support groups at the village level.



Conclusion

Mothers' support groups turned out to be a really good strategy in improving Well Woman activities which had been badly disturbed due to COVID-19.

Association between Element Content and Autonomic Cardiac Activity in Healthy Young Urban Residents

Elena Evstafeva[1], Svetlana Tymchenko[1], Anna Bogdanova[1], Natalia Baranovskaya[2], and Irina Evstafeva[1]
[1] V.I. Vernadsky Crimean Federal University, Simferopol, Russian Federation
[2] Tomsk Polytechnic University, Tomsk, Russian Federation

Cardiovascular disease (CVD) is the leading cause of death globally, with more and more scientists and doctors acknowledging the link between environmental agents and CVD and the importance of a field that some are calling environmental medicine. Heart rate variability (HRV) as a non-invasive indicator of cardiac autonomic modulation is most commonly associated with a higher risk of CVD and mortality in case of reduced HRV-derived parameters. The aim of this study was to assess the autonomic cardiac activity in healthy young individuals related to their element status under background exposure. The concentration of 28 elements was determined by neutron activation analysis (Tomsk, Russia) in the hair of 17-20-year-old healthy young individuals (34 males and 46 females) residents of Simferopol. For the assessment of autonomic cardiac activity, HRV indices were derived from 5-minute recordings at rest (Varicard 2.6, Russia). Na, Ba, Br, Ca, Fe excess, and Cr, Rb deficiency were revealed in most individuals. Na, Br, and Sb levels were significantly higher in males, and Au and Ca hair concentrations were greater in females ($0.001 \leq p \leq 0.024$).

Correlations were revealed between La and LFn, LF/HF ($r=0.31$; $p=0.006$), HFn ($r=-0.31$; $p=0.006$), suggesting sympathetic activation accompanied by a reduction of vagal tone that may be associated with La's ability to displace intracellular Fe, Ca. Correlations were also noted between Rb and LFn ($r=0.29$; $p=0.01$), HFn ($r=-0.29$; $p=0.001$), and LF/HF ($r=0.30$; $p=0.006$) where low hair Rb levels were associated with increased parasympathetic activity determined by the Rb ability to increase the duration of the action potential in human myocardium accompanied by decreases in the force of contraction. In males, correlations found between Br and heart rate ($r=-0.44$; $p=0.01$), Mo ($r=0.50$; $p=0.003$), and Me ($r=0,48$; $p=0.004$) suggest a negative chronotropic effect. The element imbalance was revealed in young individuals under background exposure. Individuals with higher hair La concentration had lower HRV indices. Therefore, cardiac autonomic functions might be altered in cases of element imbalance. Elemental analysis was supported by the grant of the State Council of the Republic of Crimea for young scientists of the Republic of Crimea and by the RFBR grant, project no. 18-29-24212.

Association Between Element Content and Autonomic Cardiac Activity in Healthy Young Urban Residents

Authors

Elena Evstafeva[1], Svetlana Tymchenko[1], Anna Bogdanova[1], Natalia Baranovskaya[2], and Irina Evstafeva[1]

[1] V.I. Vernadsky Crimean Federal University, Simferopol, Russian Federation
[2] Tomsk Polytechnic University, Tomsk, Russian Federation

Introduction

Cardiovascular diseases (CVD) are the leading cause of death globally, with more and more scientists and doctors acknowledging the link between environmental agents and CVD as well as the importance of a field that some are calling environmental medicine. Heart rate variability (HRV) as a non-invasive indicator of cardiac autonomic modulation is most commonly associated with a higher risk of CVD and mortality in the case of reduced HRV-derived parameters.

Study Aim

The aim was to assess the autonomic cardiac activity in healthy young individuals related to their element status under background exposure.

Methods

The concentration of 28 elements was determined via neutron activation analysis (Tomsk, Russia) in the hair of 17- to 20-year-old healthy young individuals (34 males and 46 females) who were residents of Simferopol. For the assessment of autonomic cardiac activity, HRV indices were derived from 5 minute recordings at rest (Varicard 2.6, Russia).

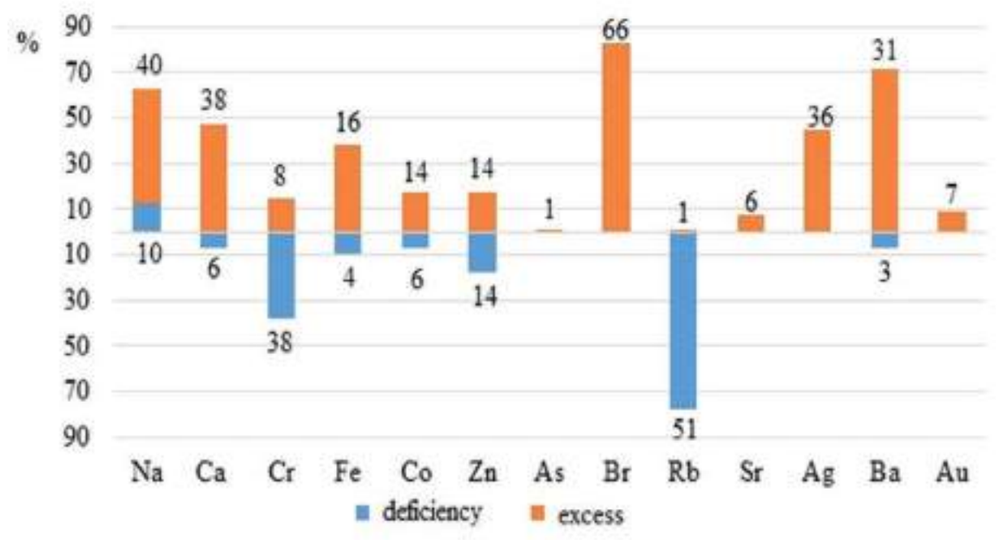


Figure 1. The occurrence of deviations from the references based on the results of the hair element analysis in residents of Simferopol (n=80) .

Y *- the proportion of the total number of people, %;* **X** *- chemical elements; numbers above the columns - the absolute number of cases.*

Results and Discussion

Na, Ba, Br, Ca, Fe excess and Cr, Rb deficiency were revealed in most individuals (Figure 1). Na, Br, Sb levels were significantly higher in males and Au, Ca hair concentrations were greater in females ($0.001 \leq p \leq 0.024$).

Correlations were revealed between La and LFn, LF/HF ($r=0.31$; $p=0.006$), and HFn ($r=-0.31$; $p=0.006$), suggesting sympathetic activation accompanied by a reduction in vagal tone, which may be associated with La's ability to displace intracellular Fe and Ca.

Correlations were also noted between Rb and LFn ($r=0.29$; $p=0.01$), HFn ($r=-0.29$; $p=0.001$), and LF/ HF ($r=0.30$; $p=0.006$), where low hair Rb levels were associated with increased parasympathetic activity determined by the ability of Rb to increase the duration of the action potential in the human myocardium accompanied by decreases in the force of contraction.

In males, correlations found between Br and heart rate ($r=-0.44$; $p=0.01$), Mo ($r=0.50$; $p=0.003$), and Me ($r=0,48$; $p=0.004$) suggest a negative chronotropic effect.

Correlations between the chemical element content in the hair were also found (Figure 2.).

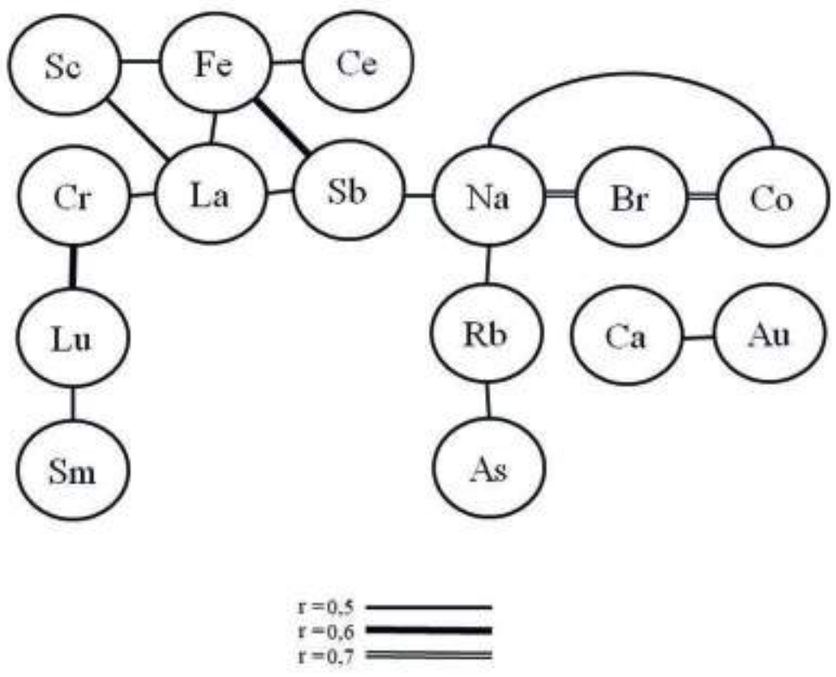


Figure 2. Correlations between the element content in the hair of Simferopol residents (r_s – Spearman's rank correlation coefficient, $p < 0.05$; critical value $r = 0.22$).

Conclusions

The element imbalance was revealed in young individuals under background exposure. Individuals with higher hair La concentration had lower HRV indices. Therefore, cardiac autonomic functions might be altered in cases of element imbalance.

Acknowledgments

The authors declare that there are no conflicts of interest regarding the publication of these results. The authors gratefully acknowledge financial support from the research grant Q 18-29-24212 from the Russian Foundation of Basic Research.

Meteorological Factors and Population Health in the South of Russia

Elena Evstafeva[1], Vladimir Lapchenko[2], Olga Zalata[1], Svetlana Tymchenko[1], and Anna Bogdanova[1]
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Possible effects of meteorological factors on population health were assessed based on daily fluctuations of meteorological parameters related to the incidences of life-threatening conditions, such as cardiovascular or respiratory emergencies in April, July, October 2017, and January 2018 in Simferopol. Spearman correlation analysis was used to explore the association between the meteorological factors and the number of ambulance call-outs for cardiovascular or respiratory emergencies and selected physiological parameters. Daily ground-level ozone concentrations (GOL) in the air along the coast of the Crimean peninsula, on average, significantly exceeded the maximum permissible values (30 μg/m^3), and absolute daily values ranged from 8 to 135 μg/m^3 in different seasons throughout 2017. Significant correlations were revealed between the number of ambulance call-outs due to bronchial asthma attacks, acute coronary syndrome, stroke, hypertensive crisis and GOL, temperature, and humidity of the atmospheric air; associations were also determined between arrhythmia and wind velocity ($0.55 < r < 0.82$, $p < 0.05$) with the maximal number of ambulance call-outs recorded in July when the highest temperature and GOL were observed.
Examination of the functional parameters in patients with cardiovascular diseases and healthy individuals showed significant correlations between the number of ventricular extrasystoles in the first group and wind velocity ($0.56 < r < 0.64$, $p < 0.05$). The stress index used to assess the cardiac regulation was associated with temperature ($0.26 < r < 0.46$, $p < 0.01$), atmospheric pressure ($r = -0.35$, $p = 0.02$), air humidity ($r = -0.49$, $p = 0.0006$), and GOL ($r = -0.38$, $p = 0.02$), suggesting decreased parasympathetic activity in healthy people.
Correlations between meteorological factors such as temperature, atmospheric pressure, and GOL play the most significant role in the functional parameters and are associated with a higher rate of life-threatening conditions, such as cardiovascular or respiratory emergencies in the population in the south of Russia.
The research was supported by the grant of the State Council of the Republic of Crimea to young scientists of the Republic of Crimea, the state assignment (theme No. 121032300023-7; Lapchenko V.A.).

Meteorological Factors and Population Health in the South of Russia

Authors

Elena Evstafeva[1], Vladimir Lapchenko[2], Olga Zalata[1], Svetlana Tymchenko[1], and Anna Bogdanova[1]

[1] V.I. Vernadsky Crimean Federal University, Simferopol, Russian Federation
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Introduction

Numerous researchers have suggested that climate change affects public health, but its impact on the cardiorespiratory system remains unexplored. Possible effects of meteorological factors on population health were assessed based on daily fluctuations in meteorological parameters related to incidences of life-threatening conditions, such as cardiovascular or respiratory emergencies in April, July and October 2017 and January 2018 in Simferopol, Crimea.

The aim of this study was to assess the influence of meteorological factors on population health based on the daily fluctuation in meteorological parameters compared to the number of ambulance call-outs for cardiovascular incidents.

Methodology

Spearman correlation analysis was used to explore the association between the meteorological factors and the number of ambulance call-outs for cardiovascular or respiratory emergencies and selected physiological parameters.

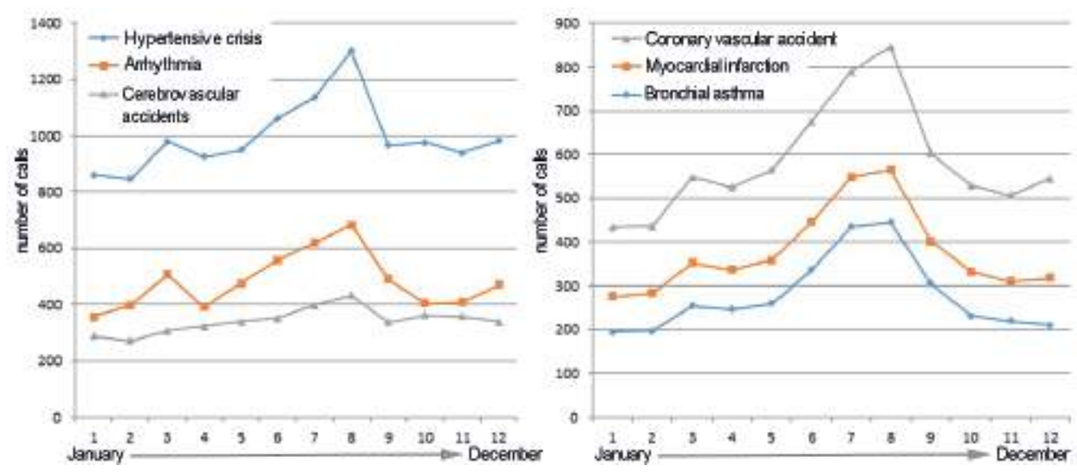

Figure 1. Annual dynamics of emergency ambulance calls.

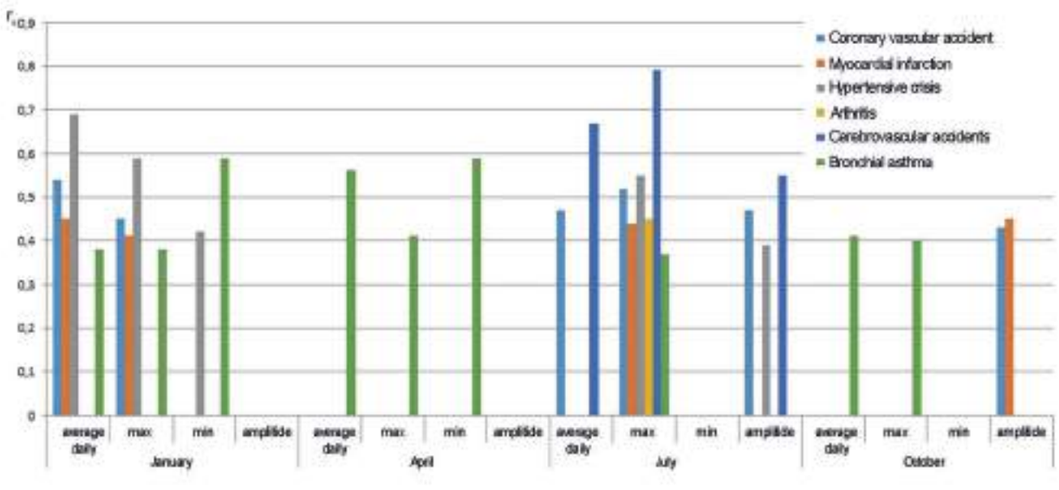

Figure 2. Correlations between emergency ambulance calls and ground-level ozone concentration.

Results and Discussion

Daily ground level ozone concentrations in the air along the coast of the Crimean peninsula on average significantly exceeded the maximum permissible values (30 μg/m3), and absolute daily values ranged from 8 to 135 μg/m3 in different seasons throughout 2017.

Significant correlations were revealed between the number of ambulance call-outs due to bronchial asthma attacks, acute coronary syndrome, stroke, hypertensive crisis and daily ground level ozone concentrations, temperature, and the humidity of the atmospheric air (Figure 1).

Associations were also determined between arrhythmia and wind velocity ($0.55<r<0.82$, $p<0.05$), with the maximum number of ambulance call-outs recorded in July, when the highest temperature and daily ground level ozone concentrations were observed (Figures 2, 3).

An examination of the functional parameters in patients with cardiovascular diseases and in healthy individuals showed significant correlations between the number of ventricular extra-systoles and wind velocity ($0.56<r<0.64$, $p<0.05$).

The stress index used to asses cardiac regulation was associated with temperature, ($0.26<r<0.46$, $p<0.01$), atmospheric pressure ($r=-0.35$, $p=0.02$), air humidity ($r=-0.49$, $p=0.0006$) and daily ground level ozone concentrations ($r=-0.38$, $p=0.02$), suggesting decreased parasympathetic activity in healthy people.

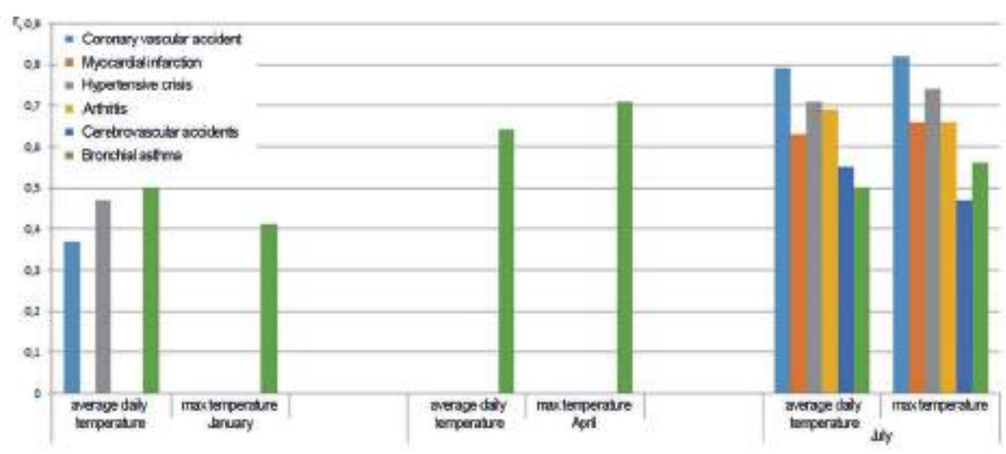

Figure 3. Correlations between temperature indicators and the number of emergency ambulance calls in different seasons of the year.

Acknowledgments

The authors gratefully acknowledge financial support from the research grant of the State Council of the Republic of Crimea to young scientists of the Republic of Crimea; state assignment (No. 121032300023-7; Lapchenko).

Conclusions

Correlations between meteorological factors such as temperature, atmospheric pressure and daily ground level ozone concentrations play the most significant role for the functional parameters and are associated with a higher rate of life-threatening conditions, such as cardiovascular or respiratory emergencies, in populations in the south of Russia.

CS4OD: Reproducible Research For Everyone

Anna Ferrari[1], Ines Pinto Pereira Da Cruz[1], Nihal Ezgi Yuceturk, Ivan Knezevic[1], Pedro Ferreira[1], Alexandros Ioannidis[1], Tomáš Roun[1], Diamantis Patsidis[3], Jose Benito Gonzalez Lopez[1], Alberto Di Meglio[1], Tim Smith[1], and Claudio Buongiorno Sottoriva[2]

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Over the last decades, data availability and technology advancements have shown enormous potential in creating innovation and enhancing progress on a global scale. However, many frictions decelerate global progress and prevent prompt and reliable responses to complex phenomena and crises. These are:

1. The absence of global coordination, regulation, and appropriate support of results deployment, together with the lack of a solid quality evaluation system, discourages researchers or private companies from opening results and sharing discoveries;
2. The lack of the definition of common approaches, standard analysis pipelines, and guidelines, together with the absence of transparency in communication across research groups and across multidisciplinary areas. As a consequence, the understanding of complex phenomena and the capability to respond promptly to crises are compromised.
3. The absence of a consistent system for reproducibility and reusability of research outputs creates overwhelming replicants that lead to significant delays in discoveries, restrain global progress, and generate extreme economic and intellectual waste.

CERN Science for Open Data (CS4OD) is a CERN project exploring and developing innovative and effective ways to tackle challenges 1-3. Among others, many efforts have been made in defining and implementing guidelines for analysis reproducibility (point 3). CS4OD is, indeed, developing a platform that guides users with very different backgrounds to organize data, code files, and set up existing or custom environments supporting reproducible analysis. The platform is built on top of REANA and Zenodo, two open-source services developed at CERN. REANA empowers users to set up environments, define and parametrize analysis workflows, and easily run an analysis with multiple docker containers. Zenodo is a multi-content repository that provides persistent storage with associated DOI. A pilot study related to excess mortality during the COVID-19 crisis demonstrated the feasibility of the platform and opened new possibilities for deploying high-quality, reliable, and reproducible research outputs.

CS4OD: Reproducible Research For Everyone

Authors

Anna Ferrari[1], Ines Pinto Pereira Da Cruz[1], Nihal Ezgi Yuceturk, Ivan Knezevic[1], Pedro Ferreira[1], Alexandros Ioannidis[1], Tomáš Roun[1], Diamantis Patsidis[3], Jose Benito Gonzalez Lopez[1], Alberto Di Meglio[1], Tim Smith[1], and Claudio Buongiorno Sottoriva[2]

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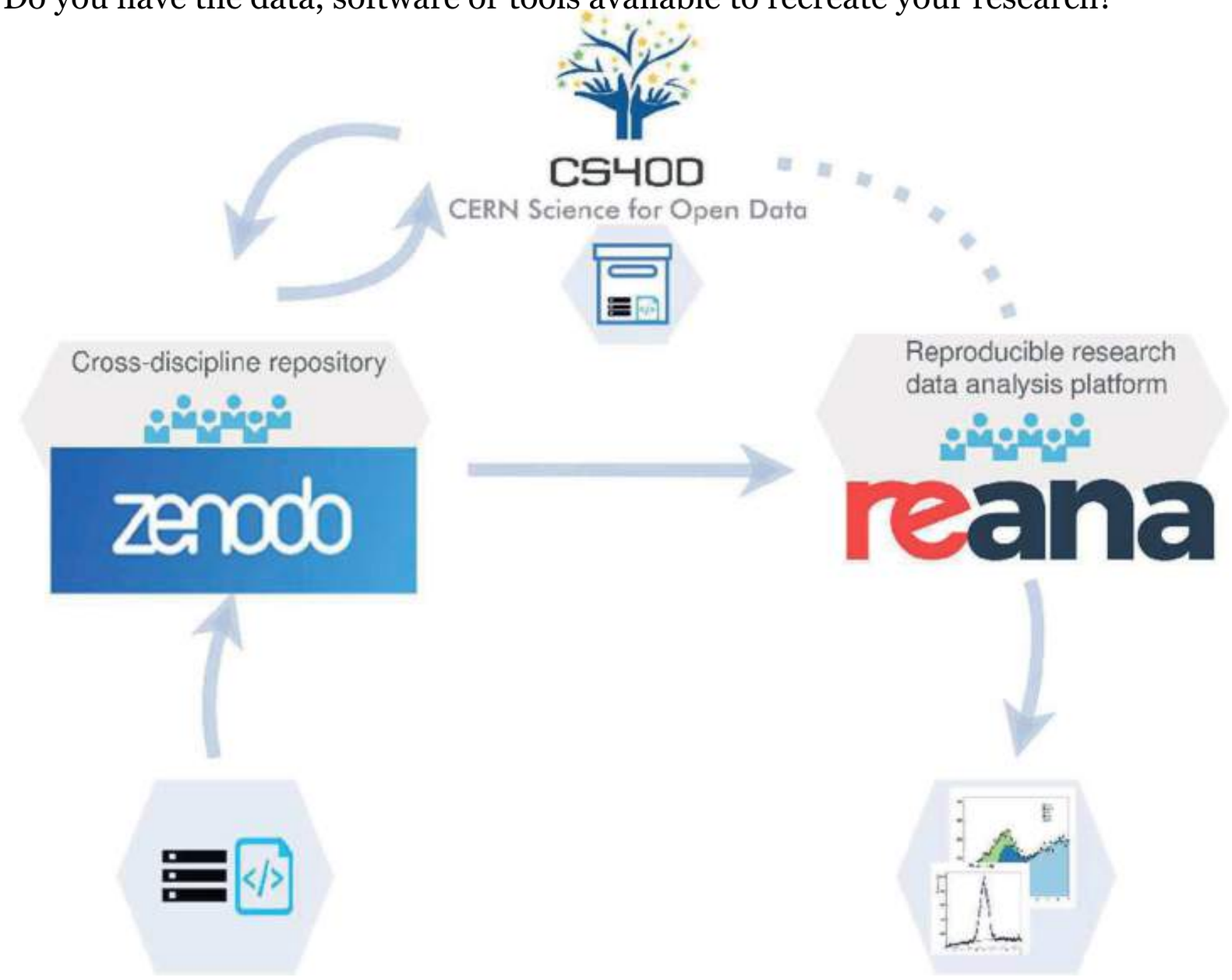
What is Reproducible Research? Can you reproduce your findings? Have you tried to re-run your research after publishing? Do you have the data, software or tools available to recreate your research?



Reproducibility is being able to run the same experiment with the same data and obtain similar results. The reproducibility of scientific research is fundamental for scientific advancement and it is ensured by documenting all the processes of how the research has been conducted [6].

Challenges

- Requirements for reproducible research differing from field to field [3].
- Waste and inefficiency in the way research is designed, carried out, analysed, and disseminated, among other things [4].
- Documentation, code, and data that are not open-source, in open access repositories, or even stored.
- Lack of time and ability to share research artifacts and resources.

Actions

- Create a stable place to store code and data.
- Integrate REANA - a way to bring the code and data together in a reliable/repeatable way - with Zenodo.
- Aggregate all resources, store and share them and collaboratively work on a project - CS4OD platform [5].

Outcomes

- Enables future reuse of research material [1].
- Accelerates future projects and discoveries in any field [1].
- Preservation of information aubot the research, data, software, etc.
- Speeds up multi-part collaboration in an easy-to-use environment.
- Replication of studies brings added value and reliability to any discovery [2].

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A One Health Approach to Prevent Future Pandemics: Joining Forces to Reduce the Health Risks in the Wildlife Trade

Kim Gruetzmacher[1,2], Kathrin Norda[1], Hannah Emde[1], Johannes Keil[1], Ulrike Buehler[1], and Constanze Riedle[1]

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Consensus exists that the COVID-19 pandemic is of zoonotic origin. Most human infectious diseases have a demonstrated origin in non-human animals, and of all emerging human infectious diseases, it is some 75%, the majority of which originated in wildlife, while ecological disruption and unsustainable consumption are the main drivers of pandemic risk. An estimated investment of only 2% over ten years of the current economic losses due to the pandemic would have not only reduced the risk of disease emergence with pandemic potential, but the ancillary benefits to climate change mitigation and biodiversity conservation would have also contributed to planetary health. To address one of the major drivers of disease emergence, the German Government launched the International Alliance against Health Risks in Wildlife Trade as an international, interdisciplinary, and inclusive multi-stakeholder platform for knowledge exchange uniting various disciplines along the One Health spectrum. With the participation of national, international, political, and civil society organizations, including Indigenous communities, and research institutions, the Alliance will pool and utilize interdisciplinary information and know-how to work on the Alliance goals: Risk reduction by translating science into policy and contributing to effective interventions, specifically in areas of high biodiversity and stress on land use. The Alliance aims to reduce the risks of zoonotic spillovers by enhancing international and national awareness, policies, and action by narrowing the gap between science and implementation while respecting cultural identity, Indigenous rights, traditional knowledge and practices, and contributing to the conservation of biological diversity. Excerpts of the exchange among the Alliance's membership (currently ~90 member organizations, from small NGOs to intergovernmental organizations and governments) are made publicly available via open access expert talks, events, and publications. With its multi-solving approach, the Alliance offers a communication venue and matchmaking to integrate expertise and evidence to improve awareness and regulation, supporting pilots and disseminating lessons learned among the community and with policymakers. It will catalyze joint action of stakeholders from the fields of biological sciences, ecology, biomedicine, human and animal health, as well as development cooperation and social sciences.

A One Health Approach to Prevent Future Pandemics: Joining Forces to Reduce Health Risks in the Wildlife Trade

Authors

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Introduction

- A consensus exists that the COVID-19 pandemic is of zoonotic origin [1].
- Most human infectious diseases have a demonstrated origin in non-human animals, 75% of all emerging human infectious diseases the majority of which originated in wildlife [2].
- While ecological disruption and unsustainable consumption are the main drivers of pandemic risk, an estimated investment of less than 2% of the current economic losses due to the pandemic over ten years would have not only reduced the risk of disease emergence with pandemic potential, but have had ancillary benefits to climate change mitigation and biodiversity conservation which would have contributed to planetary health [3].

Methodology

- To address one of the major drivers of disease emergence, the German Government launched the International Alliance against Health Risks in Wildlife Trade as an international, interdisciplinary and inclusive multi-stakeholder platform for knowledge exchange, uniting various disciplines along the One Health spectrum.
- With the participation of national and international political and civil society organizations, including indigenous communities, and research institutions, the Alliance pools and utilizes interdisciplinary information and know-how to work on the Alliance's goals. These include risk reduction by translating science into policy and contributing to effective interventions, specifically in areas of high biodiversity and stress in land use.
- It catalyzes the joint action of stakeholders from various fields, including but not limited to biological, biomedical and health sciences, ecology, human and veterinary medicine, as well as development cooperation, psychology, and social sciences, in addition to diverse forms of knowledge.

Mission

The International Alliance against Health Risks in Wildlife Trade is an open, inclusive and collaborative space where stakeholders join forces to better understand and reduce the threat of pathogen spillover from wildlife trade and markets, providing and communicating evidence, and supporting interventions, thereby reducing the risk of future outbreaks, epidemics and pandemics while concurrently improving health, equity, and well-being for all species through a One Health approach.

Activities

Members of the International Alliance against Health Risks in Wildlife Trade may—in accordance with organizational mandates and supported by the knowledge and networks gained through the Alliance—do a range of things in support of the above-mentioned goals, e.g.:

- offer evidence and knowledge of where contacts between wildlife and people have proven or potential health risks, whether in nature or in captivity, use or trade;
- minimize wildlife contact which has proven or potential health risks to humans,

e.g., by supporting communities at risk, and fill in knowledge gaps on suspected and/or understudied risk factors;

- support approaches and techniques, including traceability and pathogen surveillance and related emerging technologies along wildlife trade chains;
- support veterinary and public health facilities and capacities to be able to detect known and unknown pathogens in wildlife, and assess impact and associated risks and the integration of wildlife into veterinary systems;
- analyze capacity needs to develop policies and interventions at the national and intergovernmental levels;
- improve the regulatory frameworks and capacities of key stakeholders along wildlife trade chains (e.g., health authorities, law enforcement authorities and agencies), including the integration of biodiversity and health considerations;
- contribute to the design and the implementation of social and behavioral change initiatives with regard to the consumption of and contact with wildlife species with proven or potential human health risks;
- promote a positive image of wildlife and do not communicate health risks in a way which could harm the human-wildlife relationship.

Projects

- As of April 2022, nine projects have been started in a wide and transdisciplinary range of topics and regional outreach approaches.
- The fields of activity include pathogen discovery projects on the African continent, behavioral work with Buddhist communities in Asia, and work on knowledge, attitude and practice in four Latin American countries.
- A second call for proposals is currently open to proposals and expected to start implementation in late 2022.
- The results will be made available to all Alliance members and translated into policy recommendations, where possible.

Some of our members as of March 2022.

Results and Discussion

- The Alliance aims to reduce the risks of zoonotic spillovers by enhancing international and national awareness, policies and action by narrowing the gap between science and implementation, while respecting cultural identity, Indigenous rights, traditional knowledge and practices, and contributing to the conservation of biological diversity.
- Excerpts of the exchanges between the Alliance's membership (currently ~90 member organizations, from small NGOs to intergovernmental organizations and governments) are made publicly available via open access expert talks, events and publications.

Conclusions

- With its multi-solving approach, the Alliance offers a communication venue and matchmaking to integrate expertise and evidence to improve awareness and regulation, supporting pilots and disseminating lessons learned among the community and by policy makers.
- It will catalyze the joint action of stakeholders from the fields of biological sciences, ecology, biomedicine, human and animal health, as well as development cooperation and social sciences.

Acknowledgements

This poster was possible because of the joint work and co-creation process of the Alliance's Incubation Group, consisting of 20 member organizations. See link below for more information.

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Federal Ministry for Economic Cooperation and Development

Federal Ministry for the Environment, Nature Conservation, Nuclear Safety and Consumer Protection

giz Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH

International Alliance against Health Risks in Wildlife Trade

Characterizing Human–Wildlife Contact and Risk Factors at the Human–Wildlife Interface in Cambodia

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In Southeast Asia, agricultural and socio-cultural practices regularly bring humans into contact with wildlife. Recent epidemics (Ebola, SARS-CoV-1, and probably SARS-CoV-2) have demonstrated that these repeated contacts favor viral spillover events leading to the (re-)emergence of zoonotic viruses. It is, therefore, necessary to improve our knowledge of this critical interface to mitigate cross-species transmission and emergence of pathogens. Implemented in the frame of the ZooCov project "Toward an integrated surveillance of potentially zoonotic Betacoronaviruses in the wild animal value chains of Cambodia", this preliminary pilot study aims to characterize contact of the human population with wildlife and risk factors at the human–wildlife interface in Cambodia. Between August 2020 and March 2021, four sessions of interviews were conducted in selected villages in Stung Treng and Mondulkiri Provinces. These two areas were chosen as they encompass several wildlife sanctuaries. Wild meat consumption is common, and the circulation of several coronaviruses among wild animals has been detected. Individually structured questionnaires were used to collect socio-demographic and wildlife-related risk practices information: consumption, sale, and hunting of wildlife activities of rangers or foresters. The association between wildlife exposure and socio- demographic data was assessed using logistic multivariate analysis. A total of 901 participants aged 18-89 were interviewed, with an overall male:female ratio of 1.6. Population exposed to wildlife represented 79.1%, including 56.9% of consumers, 13.2% of rangers, 5.2% of foresters, 3.2% of hunters, and 0.6% of sellers.

Participants aged 26-32 years old (OR=2.2, IC95%: [1.3-3.8]), male (OR=3.2, IC95%: [2.2-4.8]), higher level of education (≥secondary school) (OR=2.1, IC95%: [1.1-4.2]), Krol and Thmon ethnic groups (OR=29.0, IC95% [5.9-524.1]), and monthly household income of 100-300US$ (OR=2.6, IC95%: [1.7-4.1]) were statistically associated with exposure to wildlife. The following risk practices were reported among exposed participants: consumption of cooked bushmeat (83.9%), manipulating raw bushmeat (42.5%), touching living wild animals (33.4%), consumption of raw bushmeat (23.7%), touching dead wild animals (23.3%), and killing wild animals (21.3%). Exposure frequency was the highest among foresters (57.4%), rangers (20.2%), and consumers (9.6%). Among 1,551 reports of different wild animal species consumed by participants classified as consumers and foresters, wild boars (30%), cervids such as deer and red muntjac (26%), and small mammals such as macaques, civets or squirrels (19%), were the most cited. This first characterization of the population at the human–wildlife interface in Cambodia highlights profiles and risk behavior for potential zoonotic spillover. As serums were collected for all participants, these results lay the foundations for the quantification of the risk of zoonotic virus exposition. This should constitute one of the first pillars in the implementation of an integrated surveillance system for zoonotic spillover events in Cambodia.

Characterizing Human–Wildlife Contact and Risk Factors at the Human–Wildlife Interface in Cambodia

Authors

Julia Guillebaud[1], Aude Tralci [1,2,3,4], Samom Sreng[5], Navin Chhin[6], Julien Cappelle[2], and Véronique Chevaliert[1,2,5]

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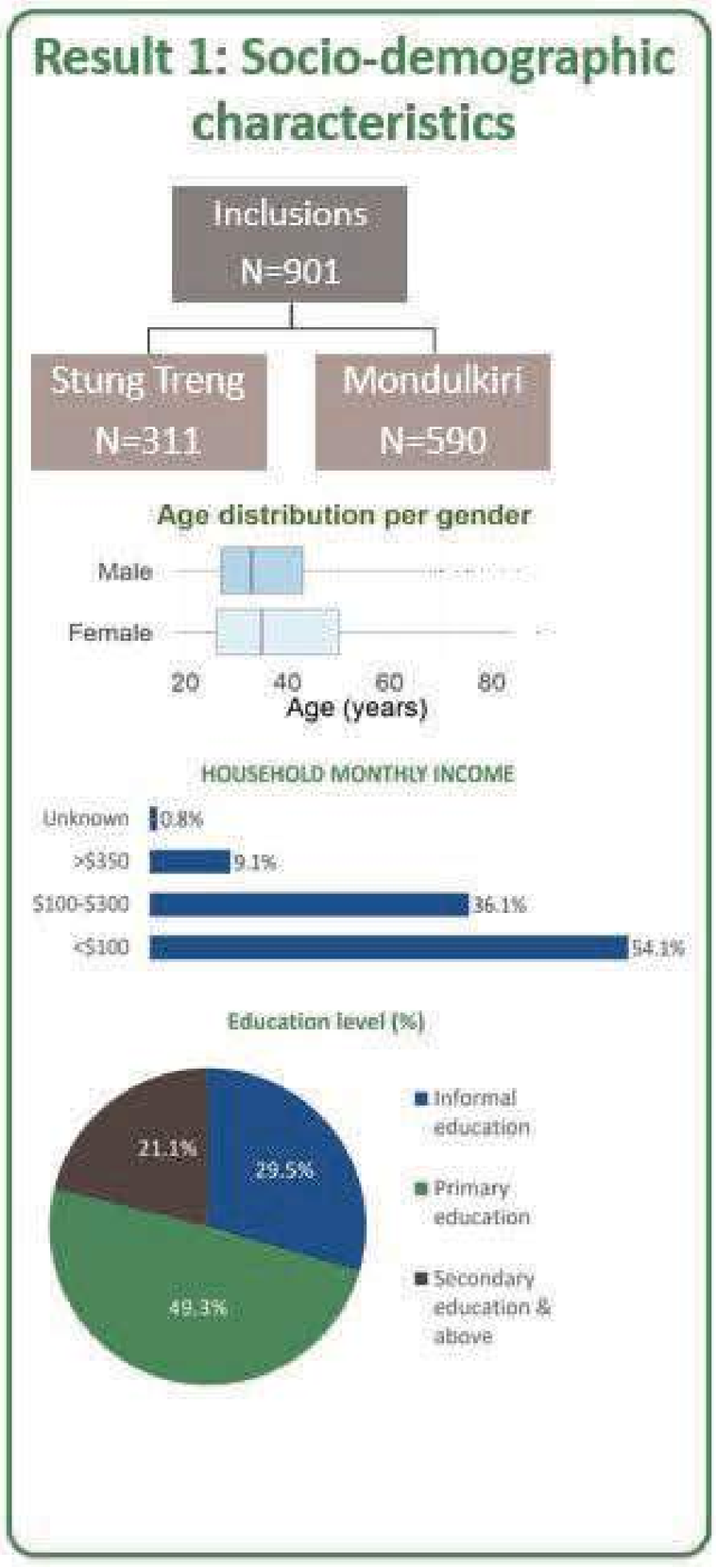
Background

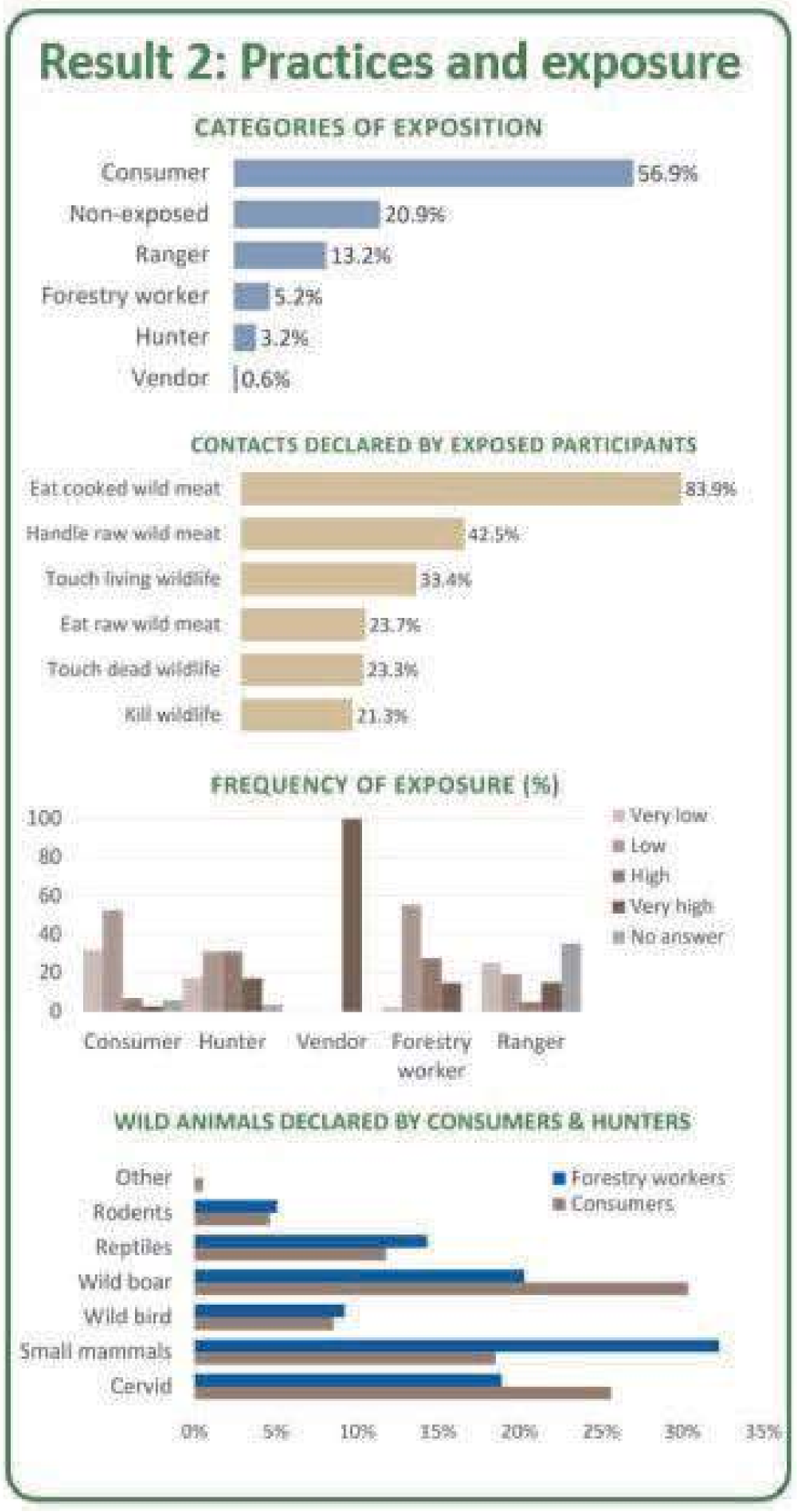
- In South East Asia, the trade and consumption of wild animals is a common practice (agricultural and socio-cultural practices
- Repeated contact between human and wildlife favors viral spillover events leading to the (re-)emergence of SARS- CoV-1, zoonotic disease, and viruses (Eprobably bola SARS-CoV-2)
- It is necessary to improve our knowledge of these critical interfaces to mitigate cross-species transmission and emergence of pathogens

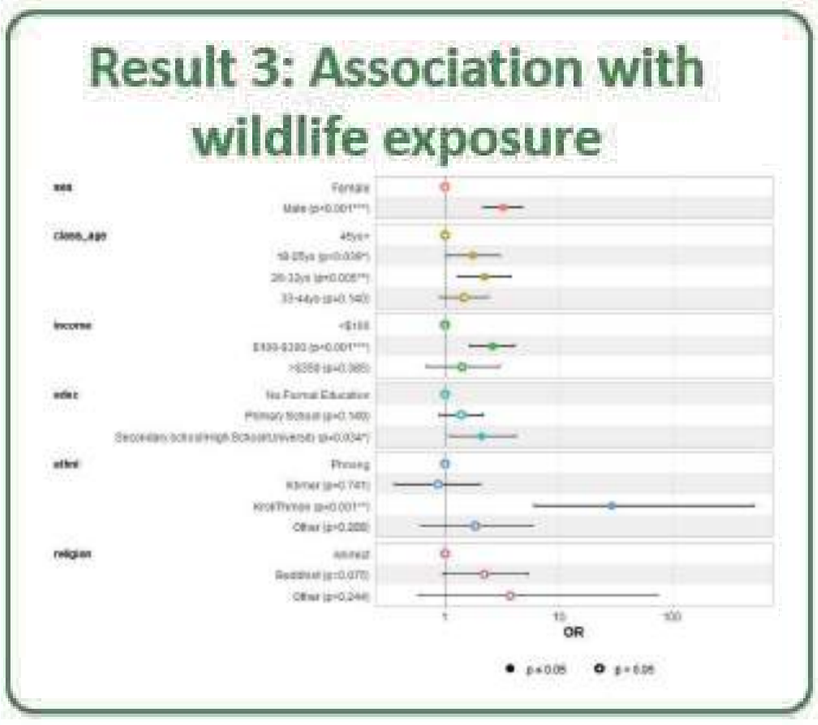
A preliminary pilot study was conducted to characterize the contact of human population with wildlife and risk factors at the human–wildlife interface in Cambodia

Materials and Methods

- ZooCoV project: "Towards an integrated surveillance of potential zoonotic Betacoronaviruses in the wild animal value chains of Cambodia"
- Between August 2020 and March 2021
- 4 sessions of interviews in selected villages in the Stung Treng and Mondulkiri Provinces
- Individual structured questionnaires: socio-demographic data, potential wildlife- related risk practices information (consumption, sale, hunting, professional activities)
- Logistic multivariate analysis to assess the association between wildlife exposure and socio-demographic data, practices and frequency of exposure







Conclusions and Perspectives

First characterization of exposure to wildlife of a rural population in 2 Provinces Cambodia. In-depth analysis of each practice per category of exposure.

Relate all these results to serological results (exposure to different coronaviruses).

Virological analyses of wildlife samples are on-going.

Acknowledgements: We would like to thank all participants for their time and interest in our investigation.

Financial support: This study was supported by the French Research Agency, the Region Occitanie and the Pasteur Asia Foundation.

Beyond One Health: Leveraging Last Mile Agriculture with Health

Shachi Gurumayum, Nirupa Sanjenbam, and Rojita Sapam
MaolKeki Foundation, Manipur, India

Only a healthy farmer can provide food and nutritional security to the rest of the world. Most farmer-training programs focus on rural smallholder 'farmers', while health programs drive efforts to reach last-mile 'patients'. However, these are the same target groups, so MaolKeki Foundation (MKF), a trust registered in Manipur, India, has been experimenting with various models for the two sectors to leverage each other's resources, skills, and networks to scale and accelerate impact. MKF has trained thousands of farmers in multiple villages in Manipur and evaluated them and their families with basic health assessments such as BP, pulse rates, blood sugar, eye checks, etc. These assessments were achieved during various farmer info sessions organized by team MKF and through regular door-to-door (D2D) campaigns carried out by a nurse resident in one of the villages to reach members of the family who were not farmers. During the info sessions, farmers were trained in good agricultural practices, but each one also had to undergo a health check. We also used social marketing to raise awareness of health and environmental issues associated with crop protection chemical residues left over in empty packaging. We are currently carrying out surveys related to female hygiene and access to sanitary products with the aim of supporting entrepreneurs to address the gap. This poster will present the work to date, the designs we used to combine agricultural training and health assessment at the last mile, and the next steps in the evolution of this integrated model.

Beyond One Health: Leveraging Last Mile Agriculture with Health

Authors

Shachi Gurumayum, Nirupa Sanjenbam, and Rojita Sapam

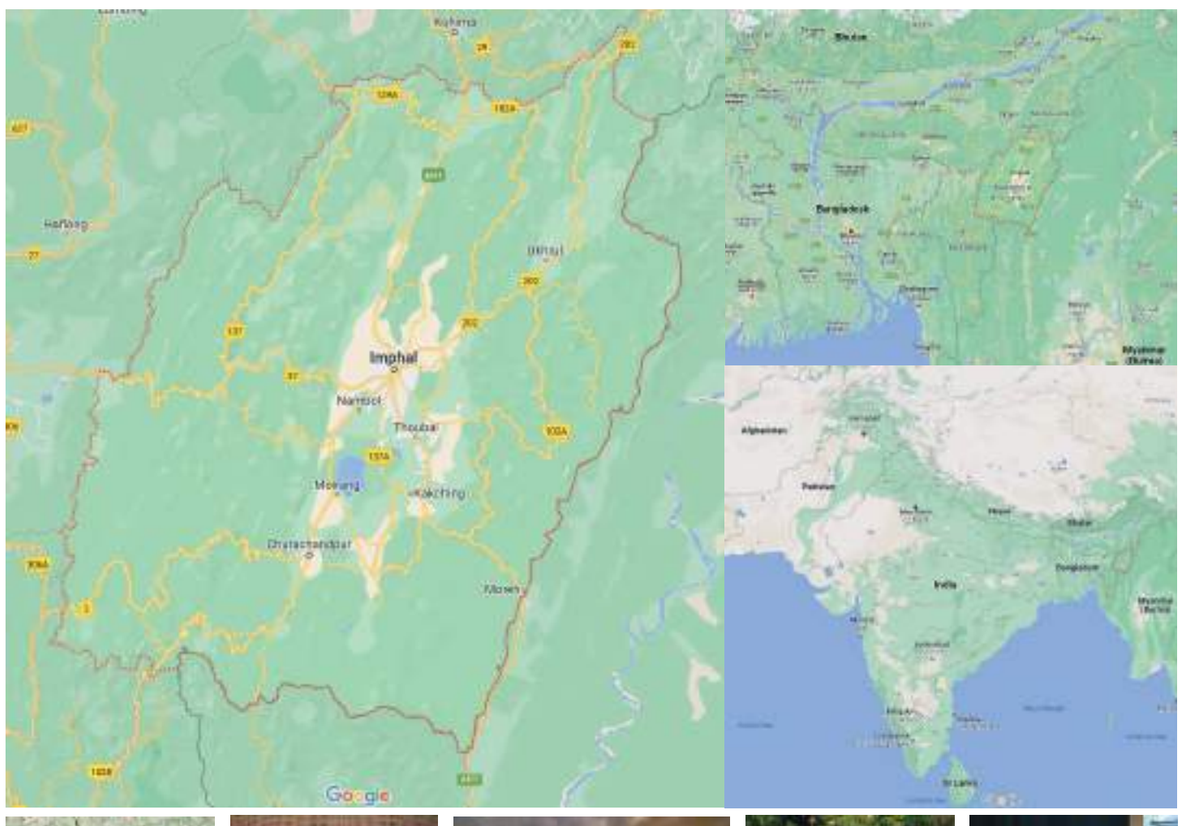
MaolKeki Foundation, Manipur, India

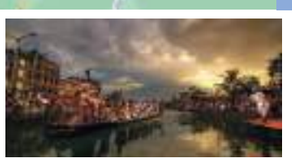
Who are we?

The MaolKeki Foundation implements pioneering last- mile integrated solutions in agriculture and healthcare.

We operate in Manipur, at the remote frontier between India and Myanmar. Manipur is about half the size of Switzerland, and 37% of its population of 2.8 million live below the poverty line.

Manipur has a rich culture and biodiversity.

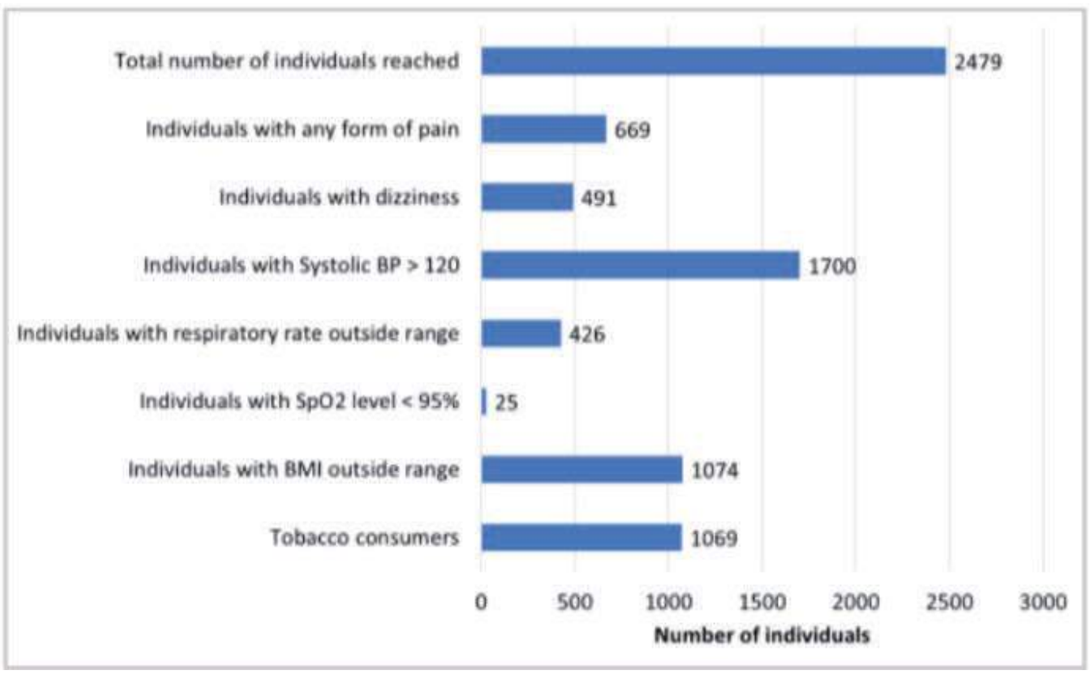




What do we do?

Our team trains rural farmers on Good Agricultural Practices, provides last-mile inputs and market access and supports AgriEntrepreneurs.

We combine our outreach programs with health assessments (BP, sugar, pulse rate, eye checks, BMI, etc.), as most rural farmers have little or no access to primary care, and provide follow-up access to nearby hospitals.



Our Findings and Learnings

- Including health assessments generated a lot more excitement amongst farmers;
- Farmers paid more attention to the agricultural training programs;
- Assessments identified multiple issues amongst farmers and their families (chart);
- 99% didn't have health cards, so paid for healthcare with income from agriculture;
- Much room for growth at the interface between agriculture and health.

Advantages and Disadvantages of Agriculture and Healthcare Working Together

✓ Same target population
✓ Similar target geographies
✓ Pulls in a larger number of beneficiaries
✓ Can leverage program infrastructure
✓ Cross-learnings help drive development

x Greater logistical requirements
x Teams need full alignment and buy-in x Greater cost to organize activities
x Difficult to engage large organisations to work together

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Our partners

Oxysaver: A High Conservation Demand Oxygen Delivery System with Increased Throughput

Syed Razwanul Haque[1], Dewan A. F. K Choudhury[1], Ju-un Choudhury[1], Tanzilur Rahman[1], Shazzad Hossain Lelin[1], Shovon Sudan Saha[1], Meherun Nesa[1], Ashrafuzzaman[2], and Saif Ahmed Quarishi[2]

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Oxygen has been an indispensable therapeutic drug. Patients with chronic lung disease rely on treatment involving supplemental oxygen. In light of the sudden surge in oxygen demand due to the COVID-19 pandemic, coupled with a lack of oxygen supply, new methods of oxygen delivery have been looked into as a possible solution. OxySaver, a novel demand oxygen delivery system proposed by Bioforge Ltd., is designed with the objective of reducing oxygen consumption significantly and cost-effectively. OxySaver seamlessly fits even low-resource settings. OxySaver can also serve multiple patients from a single source through multiplexing, which ensures maximizing the efficiency of usage. OxySaver includes a pressure sensor to detect the patient's demand, a solenoid valve for switching the supply on demand, and a processing unit.

OxySaver is then attached to an oxygen cylinder with a flow meter. The subjects on the test have two cannulas attached to them, one coming from the oxygen cylinder and the other from OxySaver. When the patient inhales, the OxySaver allows oxygen to come out of the cylinder. During exhalation, the OxySaver ensures that the supply remains closed. Compared to conventional continuous oxygen flow, this saves oxygen, which would otherwise be lost during exhalation. The OxySaver prototype has been tested with a benchmarking tool on multiple subjects to ensure performance and reliability. The criteria set for testing were oxygen conservation rate, power efficiency, patient comfort, durability, and safety. The hours-long endurance tests indicated that OxySaver conserves 50% more oxygen compared to conventional methods. It requires no calibration and does not involve any discomfort. The oxygen flow shifts to continuous flow when the cannula becomes loose or a power outage occurs. OxySaver has passed all testing criteria to receive approval for a clinical trial. It has already received medical certification from a medical certification authority. OxySaver will improve the conservation of oxygen supplies, reduce costs for patients and improve hospital capacity for oxygen treatment. There is no risk in implementing this system in hospitals. Therefore, we strongly believe that the conservation of oxygen using Bioforge OxySaver will help meet COVID-19 or any future oxygen demand.

Oxysaver: A High Conservation Demand Oxygen Delivery System with Increased Throughput

Authors

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Prototype

Bioforge proposes OxySaver, a novel, cost-effective Demand Oxygen Delivery System which can reduce oxygen consumption significantly. It includes a pressure sensor, a Normally Open solenoid valve, and a processing unit to ensure the supply of oxygen only during inhalation by the patients. It can be set up easily with existing oxygen cylinders and oxygen pipelines in hospitals. The device will improve the conservation of oxygen supplies, reduce costs for patients and improve hospitals' capacity for oxygen treatment.

Design

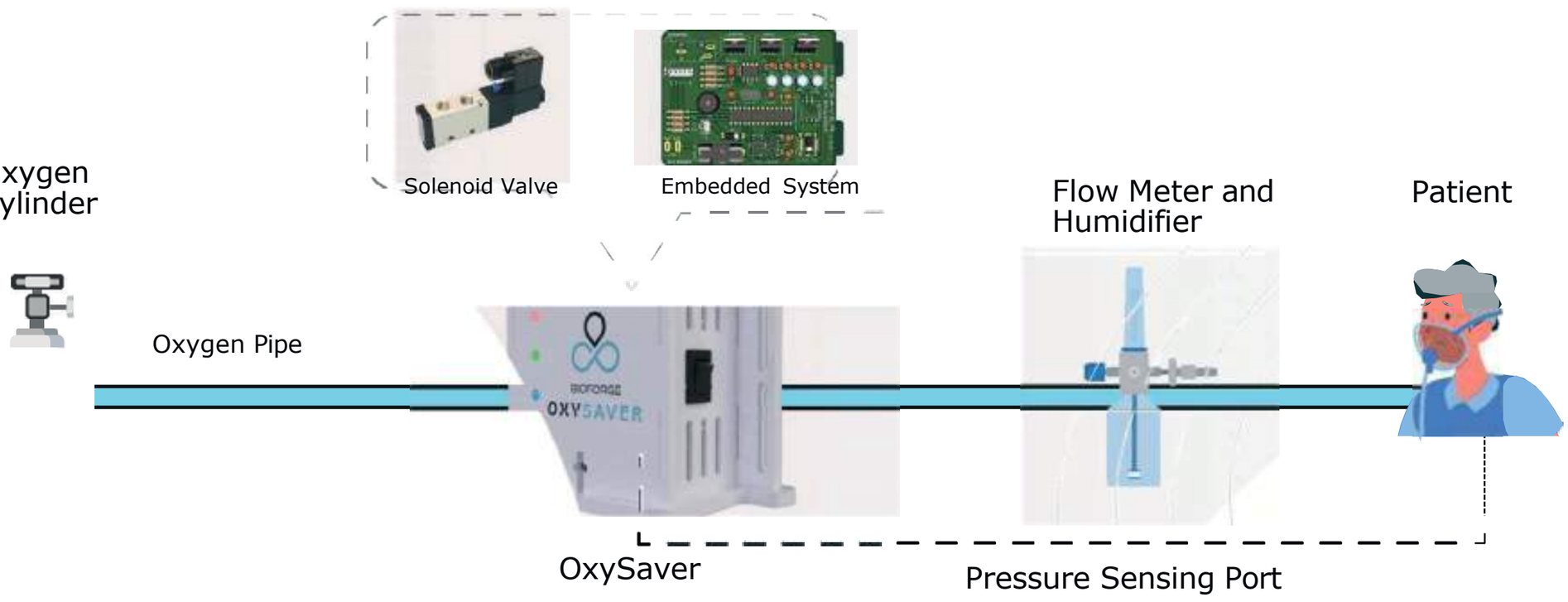

Figure 1.: OxySaver setup with cylinder.

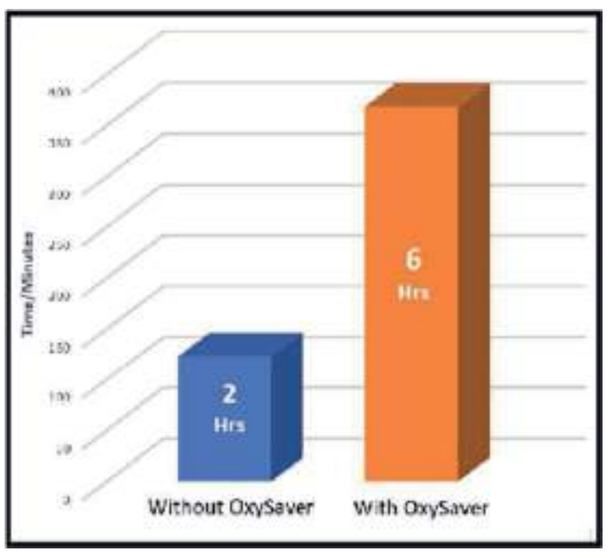

Figure 2.: Cylinder duration test results with and without OxySaver.

Figure 3.: Tripartite valve to serve three patients from single source.

Results

50% More oxygen conserved

Requires **only** **3%** power compared to current products

67% Reduction in refill cost

From a **single source**, up to **3** patients can receive oxygen at the same rate

Impact of OxySaver

Adapts to breathing rate in real time; Reduces refill costs;

Readily available parts, affordability, reusability and easy production; Easy replacement;

Easy installation with the existing hospital oxygen distribution system.

Fail safes

Continuous flow of oxygen in case of:

a) Power outage

b) Breath not detected for more than 6 seconds

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Building Better Healthcare

Association of Environmental Pollutants and the Prevalence of Intellectual Disability in Caribbean Countries from 2006 to 2016

Demian Arturo Herrera Morban[1] and Ana Carolina Escarraman Martinez[2]

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[2] Associate Researcher, Centro de Investigación Dr. Hugo Mendoza, Hospital Pediátrico, Santo Domingo, República Dominicana

Environmental pollutants are considered risk factors for developing intellectual disability when exposure occurs during pregnancy and the first years of life. This has been poorly studied in Caribbean countries. Our main objective is to investigate this association. This is a descriptive-exploratory study based on data obtained from the "Our World in Data" platform (https://ourworldindata.org/) in Microsoft Excel format that included the desired variables. Only the countries that reported all the variables of interest were included.
Multivariable regression analyses and linear regression analyses were performed with the SPSS version 20 programs and the Microsoft Excel spreadsheet. Multivariable regression analysis, including all the variables, demonstrated a significant correlation (r= 0.99, p = 0.049) between the incidence of intellectual disability and the environmental pollutants measured. Household air pollution (r = 0.95, pandlt;0.001) and the prevalence of anemia among pregnant women (r =0.94, pandlt;0.001) demonstrated the strongest correlation with the prevalence of intellectual disability. Our hypothesis for the association of environmental pollutants and the incidence of intellectual disability is likely. We demonstrated that environmental pollutants are strongly associated with the incidence of intellectual disabilities in Caribbean countries. Other factors not included in our study, including the socioeconomic level, could also influence the different variables and the presence of intellectual disability.

Association of Environmental Pollutants and the Prevalence of Intellectual Disability in Caribbean Countries from 2006 to 2016

Authors

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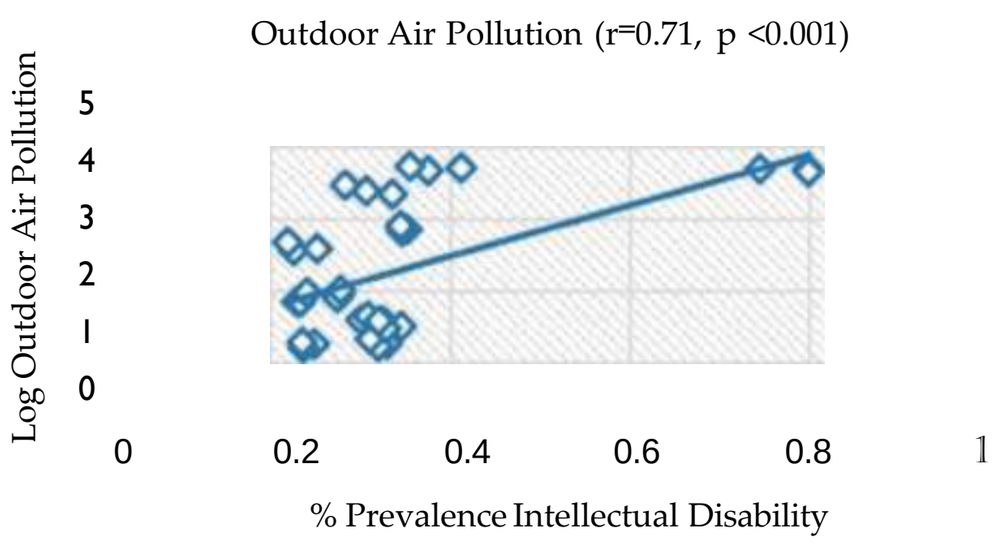
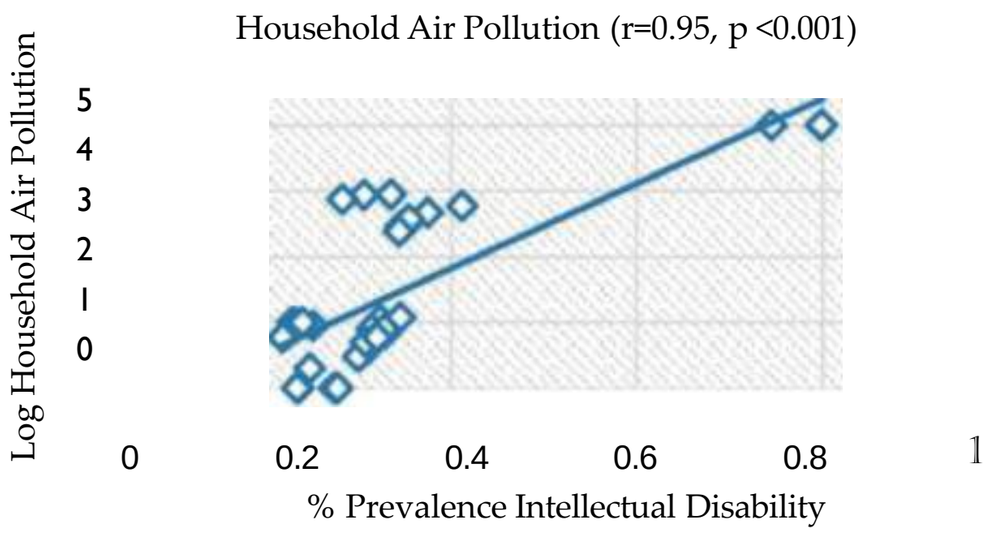
Introduction

Environmental pollutants are considered risk factors for the development of intellectual disability when exposure occurs during pregnancy and the first years of life. This has been poorly studied in Caribbean countries, so our main objective is to investigate this association.

Methodology

A descriptive-exploratory study based on data obtained from the "Our World in Data" platform (https:// ourworldindata.org/) in Microsoft Excel format that included the desired variables. Only the countries that reported all the variables of interest were included. Multivariable regression analyses and linear regression analyses were performed using SPSS version 20 programs and the Microsoft Excel spreadsheet.





Conclusion

We demonstrated that environmental pollutants are strongly associated with the incidence of intellectual disabilities in Caribbean countries. These results coincide with previous studies that have identified the presence of environmental pollutants as risk factors for the development of intellectual disabilities. Other factors not included in our study, including the socioeconomic level, could also influence the different variables and the presence of intellectual disability.

Results and Discussion

The multivariable regression analysis including all the variables demonstrated a significant correlation (r= 0.99, p = 0.049) between the incidence of intellectual disability and the environmental pollutants measured. After performing a linear regression with each variable,

household air pollution (r = 0.95, p<0.001) and the prevalence of anemia among pregnant women (r =0.94, p<0.001) demonstrated a strong correlation with the prevalence of intellectual disability. Outdoor air pollutants (r = 0.71, p<0.001) and annual CO2 emissions (r=0.53, p<0.001) demonstrated a weaker but still statistically significant correlation.

The results found in the analysis for this study suggest that our hypothesis for the association of environmental pollutants and the incidence of intellectual disability is likely. This can be supported by the results found in Emerson et al., where children with intellectual disabilities were more likely to live close to areas with high exposure to outdoor air pollution, in comparison with children without intellectual disabilities (1). Figure 1. Correlation Scatter Plots of statistically significant variables.

During our analysis, there was a strong correlation between anemia in pregnancy and the presence of intellectual disability. A previous study by Wiegersma et al. found that ASD and intellectual disability prevalence was higher in children of mothers with anemia during pregnancy (2). While we found a strong correlation between household air pollution and intellectual disability, we could not find studies that supported these results.

Table 1. Regression analysis.

Data analysis Output	Pearson's Correlation coefficient (r)	P-value
Multivariate regression (All variables included)	0.9876295	0.049983*
Household air pollution	0.9533765	<0.001*
Outdoor air pollution	0.7057074	<0.001*
Prevalence of anemia among pregnant women	0.9433959	<0.001*
Total including LUCF (CH4 emissions, CAIT)	0.2779996	0.10
Total including LUCF (N2O emissions, CAIT)	0.325656	0.052
Annual CO2 emissions	0.534743	0.00078*

*Statistically significant.

References

1. Emerson et al. 2019, Journal of intellectual disability research. DOI: 10.1111/jir.12561
2. Wiegersma et al, 2019, JAMA psychyatry, DOI: 10.1001/ jamapsychiatry.2019.2309

Feasibility and Acceptability of Wearable Devices for Climate Change and Health Research in the Low-Resource Contexts of Burkina Faso and Kenya

Sophie Huhn, Mara Koch, and Ina Matzke
Heidelberg Institute of Global Health, Heidelberg University Hospital, Heidelberg University, Heidelberg Germany

Climate change has an early and strong impact on vulnerable sub-Saharan regions. However, data on these regions to power climate change and health research remain scarce. Wearable devices may provide new opportunities to generate reliable data. In the last decade, health research using wearables has increased considerably, emphasizing the enormous potential. In particular, studies on health effects and exposure to heat have increasingly used wearables. However, most studies have been conducted in upper-middle- and high-income countries. We aim to investigate the feasibility and acceptability of using wearables for research on climate change and health in two health and demographic surveillance systems (HDSS): Nouna, Burkina Faso (BF), and Siaya, Kenya (K). To understand the usage of wearables for health research and to scope the literature on the use of wearables for the measurement of climate change-related health impact and exposure, we conducted two scoping reviews that provided the scientific background to design the field studies. For the feasibility field studies, we recruited 244 individuals (50% female, aged 6-84 years). Participants wore wearables (Withings Pulse HR fitness tracker, Tucky thermometer patch) over a period of three weeks and completed acceptability questionnaires every 4-7 days. Informal feedback from field staff was also collected. Acceptability questions had an overall agreement of 97% (BF), and many participants were positive about the wearables, at times even perceived them as fashionable items. Some reported concerns were accidentally damaging the wearables (n=40, 5%) and health hazards (n=15, 2%). Acceptability, as well as data completeness, was similar between gender, age, and study arms. Data completeness of heart rate and temperature measurements was considerably lower than of accelerometry (steps, sleep). Technical issues like malfunctioning synchronization (n=6, 1%) and lack of adhesion for the thermometer patch (n=25, 3%) were reported. Based on our results, wearables may become an accepted, feasible, and valuable tool for low-resource health research, also investigating individuals' exposures and real-time health effects of climate change-related events such as extreme weather occurrences. Particular emphasis should be placed on study implementation (regular visits and comprehensive participant information necessary), wearable sturdiness, and data handling.

Feasibility and Acceptability of Wearable Devices for Climate Change and Health Research in Low-Resource Contexts Burkina Faso and Kenya

Authors

Sophie Huhn, Mara Koch and Ina Matzke

Heidelberg Institute of Global Health, Heidelberg University Hospital, Heidelberg University, Heidelberg Germany

Background

Climate change has had an early and strong impact on vulnerable sub-Saharan regions. However, data from these regions to power climate change and health research remain scarce. Wearable devices may provide new opportunities to conduct reliable research, given their advantages in continuously capturing data in real-life settings of individuals, even in low-resource contexts. This approach can be used to gain insights regarding the effectiveness of interventions.

Objectives

Is the use of wearables for climate change and health research in cohorts in the Siaya region, Kenya (K), and Nouna region, Burkina Faso (BF), feasible and accepted?

"Nothing can stop me from participating"

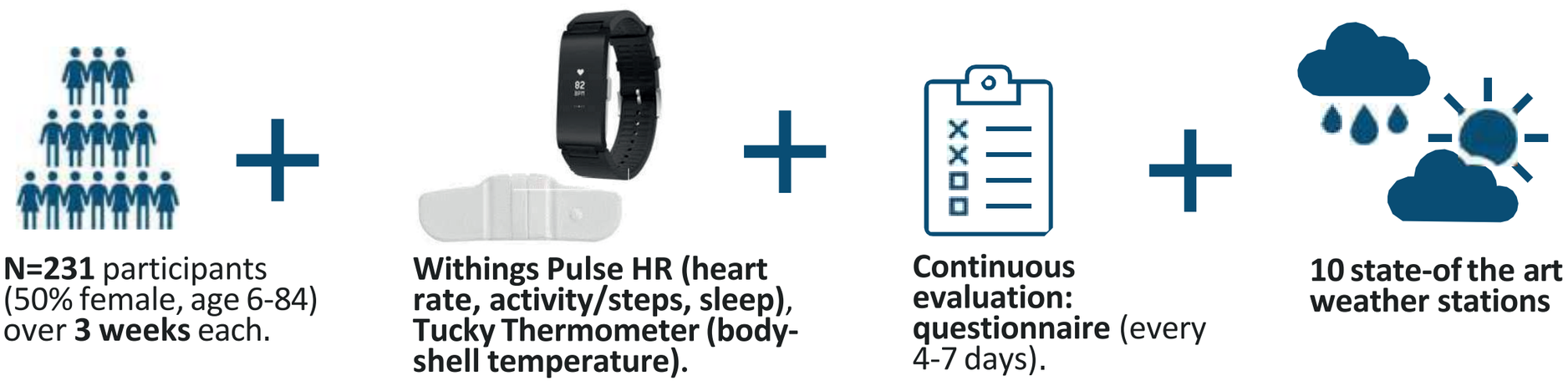
"It helps me control my health"

"Is it dangerous to wear?"

(participants in K, BF)

Figure 1. Participant in K receiving the wearable device.

Methodology



Results

The acceptability questions had an overall agreement of 97%/93% (BF/K). Participants emphasized the practicability of the watch function (K) of the wearable, at times even perceived the wearable as fashionable (BF, K), and stated that others showed great interest in the wearables (K). Of the participants, 40.5% (BF) were afraid of accidentally damaging the wearable. The data completeness of heart rate and temperature measurements was considerably lower than of accelerometry (steps, sleep). Difficulties encountered included malfunctioning synchronization and use of the adhesive wearable (BF: lack of adhesion, K: tape too sticky/painful).

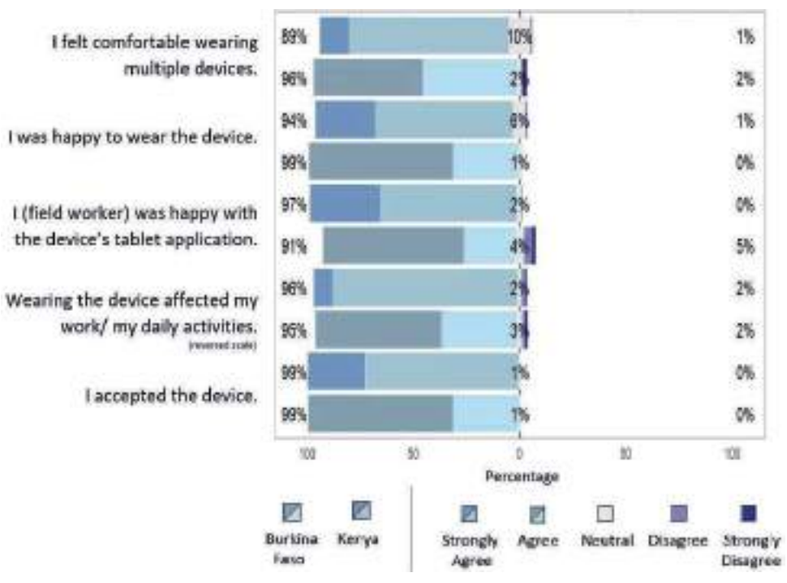


Figure 2. Answers to the acceptability questionnaire.

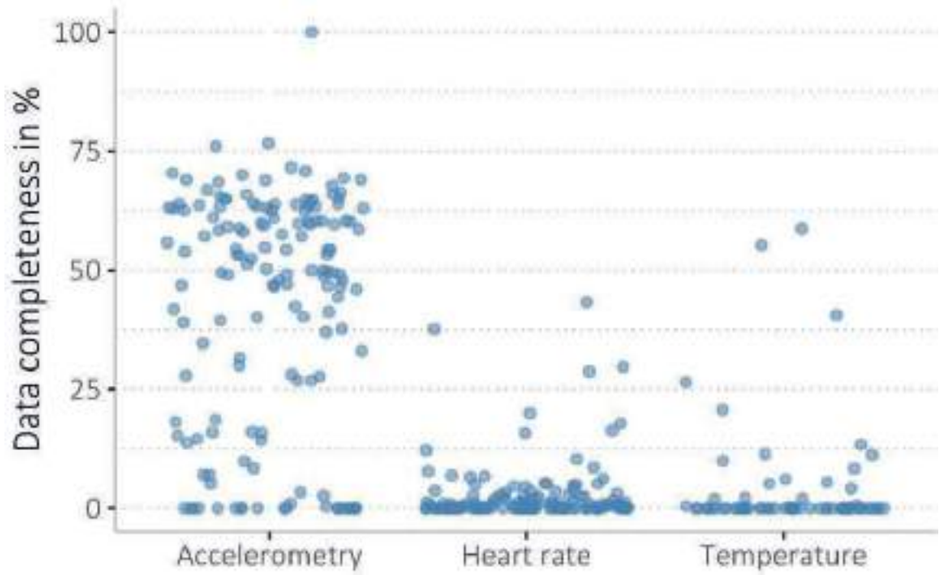


Figure 3. Data completeness.

Conclusions

Based on our results, wearables are an accepted, feasible and valuable method to generate health insights into low- resource contexts and to potentially investigate individuals' exposures to and direct health effects of climate- change-related environmental conditions.

Recommendations

We have found that data completeness was higher when there were regular visits from field workers to study participants. More focused research is needed to increase data quality and implement research standards.

Climate Change and Health in sub-Saharan Africa

HEIDELBERG UNIVERSITY HOSPITAL

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Digitizing Health Interventions to Address Systemic Global Health Threats (Such as Antimicrobial Resistance) Can Lead to Environmental Deleterious Effects (Including on Human Health) and Overstepping of Planetary Boundaries (Climate Change and Freshwater Pollution)

Maxime Karlen, Jason King, Pascale Schwab Castella, and Valérie D'Acremont

Thanks to their relatively low cost and potential for large-scale implementation, digital health interventions are seen as a promising way to improve care, especially in low-resource countries. Although the ecological footprint of digital activities is increasingly recognized, the environmental and climatic impact of digital health projects is generally not considered. The use of large numbers of digital tools could strongly increase soil, air, and water pollution, as well as CO2 emissions, and therefore contribute to the negative impact of the environment and climate changes on human health. This analysis aims to measure the environmental impacts of the use of a clinical decision-support algorithm (CDSA), called ePOCT+, aimed at improving the management of sick children in primary healthcare settings in Tanzania (DYNAMIC project). Life cycle assessment (LCA) is a powerful and internationally standardized methodology (ISO14040ff), which evaluates the potential environmental impacts of products or services during their entire life cycle, including upstream and downstream processes associated with each step (raw material extraction, transport and transformation, and use and disposal). The system boundaries and limits to the analysis chosen correspond to the specificity of the DYNAMIC project. Things not considered: previous research and development steps and the usual management of patients. The functional unit is defined as "the use of one clinician work place during one year of operation". The analysis is stratified by health center (production, use, and end-of-life of tablets), district office (training, supervision, and monitoring), central (data cleaning and analysis), and (Swiss) external (machine learning analyses) levels. The damages to human health, ecosystems (in particular climate change), and resource availability associated with the IT material used and data flow are evaluated using validated LCIA models. With this LCA, we aim to understand and raise awareness of the environmental impacts of the development and implementation of digital health projects in order to improve or replace the most polluting tools or activities with more sustainable alternatives. We will finally balance these risks with the environmental benefits of the decrease in antibiotic prescriptions and with the health outcome improvements achieved through the implementation of the CDSA.

Digitizing Health Interventions to Address Systemic Global Health Threats (Such As Antimicrobial Resistance) Can Lead to Environmentally Deleterious Effects (Including on Human Health) and Overstepping of Planetary Boundaries (Climate Change and Freshwater Pollution)

Authors

Maxime Karlen, Jason King, Pascale Schwab Castella, and Valérie D'Acremont

Introduction

The large ecological footprint of digitalization is increasingly being recognized. However, the precise environmental and climatic impact of digital health projects, and their consequences for human health and ecosystems, are not well known.

We aimed to measure the environmental impact of the use of ePOCT+, an electronic clinical decision support algorithm (CDSA) aimed at decreasing child morbidity and mortality, while reducing the unnecessary prescription of antibiotics at the primary care level in Tanzania (DYNAMIC project).

The DYNAMIC project in Tanzania in a few numbers:

40 primary care facilities; 49 android tablets;

40 pulse oximeters;

35 000 antibiotic prescriptions avoided per year;

91 000 sick children managed per year.

Preliminary Results

- The DYNAMIC project generates greenhouse gas (GHG) emissions of 23 tons of CO2-eq per year (in addition to routine care) in order to manage 91 000 sick children (Figure 1). This represents the GHG of 13 Tanzanians or 1.3 Americans over one year.
- These emissions are partly counterbalanced by those avoided thanks to the reduction in antibiotics prescriptions, with a GHG saving of 15.5 tons of CO2-eq per year.
- Further results will determine the indirect damage to human health and damage to ecosystem quality

Carbon Footprint of the Dynamic Project

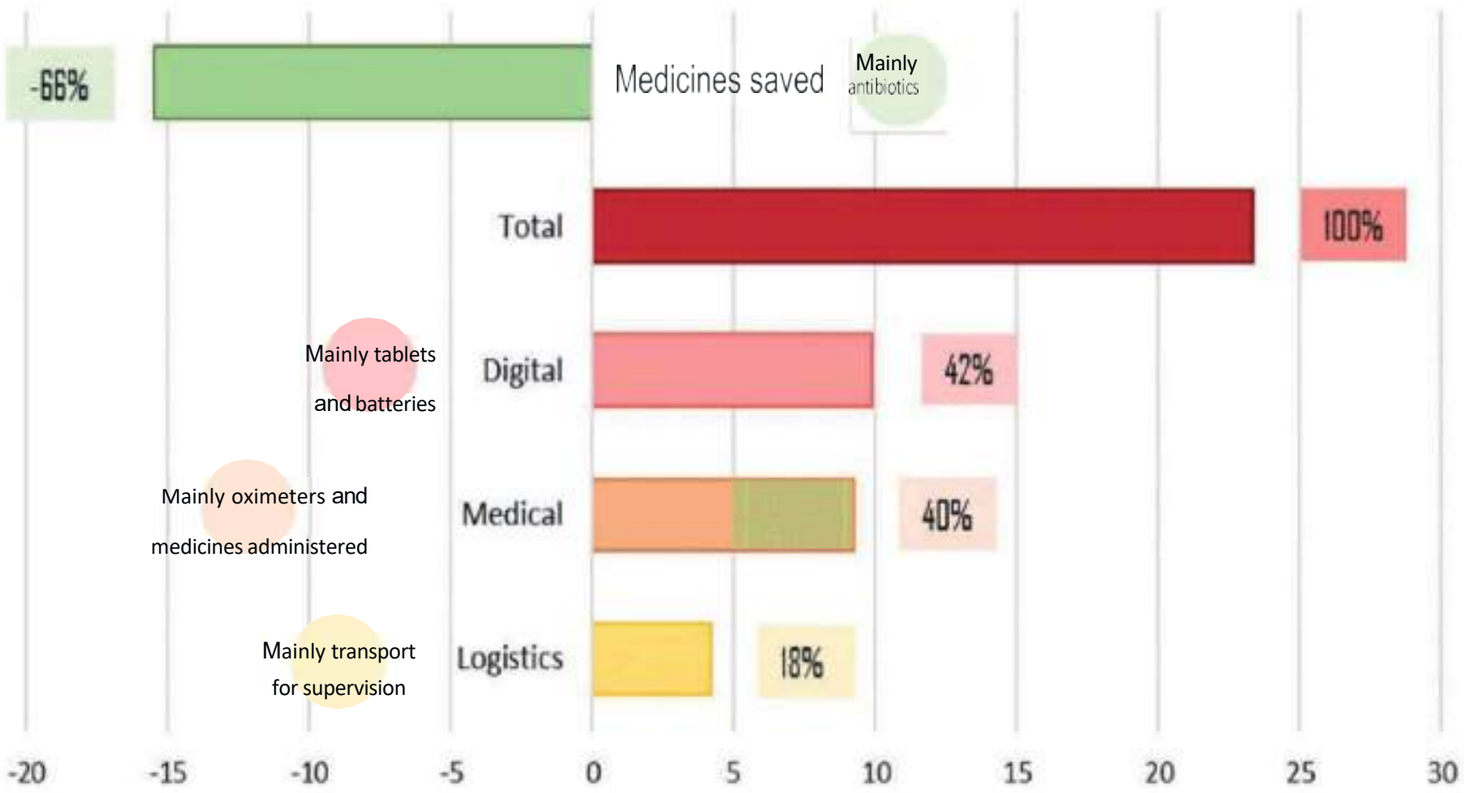

Figure 1. Carbon footprint of the DYNAMIC project's activities (added or avoided compared to routine care) over a one year period. Values are in tons of CO2-eq/year.

Methodology

- We compiled an inventory of all supplies and activities added or avoided by the DYNAMIC project compared to routine care in Tanzanian primary care facilities (materials purchased, energy consumed, and waste and emissions generated by each process). Calculations were based on one year of operation of the project.
- Each activity or supply was translated into elementary flows - inputs and outputs of the system (the project) in the ecosphere, e.g. CO2 emissions - using the ecoinvent database v3.8.

Those inputs and outputs were translated into environmental impacts with the peer-reviewed method IMPACT World+ (Bulle et al., 2019) with the following indicators:

- Climate change (expressed in kg CO2-eq);
- Damage to human health (expressed in DALYs);
- Damage to ecosystems quality (expressed in PDF*m2*yr).

Discussion

The DYNAMIC digital health project produces a significant carbon footprint in addition to that already generated by the health care system. Identifying means to decrease this deleterious impact on human health and ecosystems (e.g., by combining the digital applications of several interventions on a single electronic device) must be explored. This impact was, however, partly mitigated by the reduction in GHG due to the decrease in antibiotic prescriptions, an additional benefit of antibiotic stewardship programs.

PARTNERS

FUNDERS

Project Wote Maji Safi Ni Afia: Drinking Water Distribution in Sensitive Areas in the East of DRC

Gaston Kayenga
NGO Health and Education For All, Kinshasa, Democratic Republic of the Congo

Our project focuses on the problem of access to drinking water in a sensitive area of insecurity in the east of the DRC. The project will be carried out in the districts of Ciriri, with a population of two hundred and twenty-three thousand (223,000), and Panzi in Bukavu, with four hundred and seventy thousand (470,000) people in eastern DRC in the communes of Bagira and 'Ibanda and the beneficiaries of the project number 1300 individuals. The objective is to improve the conditions of access to drinking water for a period of three years. The inhabitants of the districts of Ciriri and Panzi have access to a daily supply of drinking water in quality and quantity at an affordable cost. Beneficiaries are involved in project management and governance, and building skills. Community ownership of project beneficiaries will help achieve social impact, and sustainability will be ensured by stakeholders and beneficiaries. The basic activities were carried out in the field. The intervention methodology is the participatory, inclusive approach by the population based on human rights referring to articles 42, 47, 48, 53, and 58 of the constitution of the DRC, which speak of fundamental rights and objectives of sustainable development (SDGs3, 6, and 17) of the United Nations. The results achieved by this project have made it possible to set up a map of water sources, water points, rivers, and the lake of the city of Bukavu. The geophysical studies of the drilling area and the consultations with the project stakeholders were significant achievements in the field during the local consultations.

Projet Wote Maji Safi Ni Afia: Distribution d'Eau Potable en Zone Sensible de Conflit a l'Est de la RDC

Authors

Gaston Kayenga

NGO Health and Education For All, Kinshasa, Democratic Republic of the Congo

Contexte

RDC est un pays de l'Afrique centrale qui s'étend sur l'Afrique de l'Est et Australe, Sa capital est Kinshasa. L'insécurité est un défi à l'Est. Le projet porte sur la problématique d'accès à l'eau potable, assainissement et l'hygiène et la paix (ODD6I). Bien que la RD. Congo disposant d'une grande réserve d'eau douce, la desserte nationale de l'eau potable reste faible en RD. Congo. Une série d'évènements douloureux se sont succèdes et continuent dans la région du grands lacs. C'est le contexte dans lequel nos investigations ont été realisées pour le projet dans la Province du Sud Kivu ville de Bukavu en RDC.

Consequences et Risques

Les consequences de manque d'eau et d'emploi des jeunes a de nombreuses consequences sur la vie dans ces quartiers:

1. Site de proliferation des maladies hydrique dans la ville et absence d'assainissement dans ces quartiers:
2. Bastion d'insécurité et de recrutement des milices et groupes armés à cause de la pauvreté et misères dans les quartiers
3. Révolter des contre les injustices sociales de marginalisation de leurs quartiers.

Conclusions

1.L'eau est une ressource vitale pour les hommes, les animaux et les plantes, agir maintenant c'est mieux, demain c'est lard pour la ville Bukavu, sans eau, il n'y a pas de vie sur terre. Ces données ont été tirées de notre projet Wote Maji Safi ni Afia distribution d'eau potable en zone sensible de conflit à l'Est de la RD. Congo. Celle absence d'eau aura des dégâts collatéraux dans les jours avenir. Merci à tous.

La durée est de 3 ans début 2022 prend fin 2024 sur ce, le projet a besoin d'accompagnement financier, technique, visibilité et promotion. La méthodologie d'intervention est l'approche participative inégrée. L'objectif du projet est d'améliorer les conditions d'accès à l'eau potable et à rassainissement pour les habitants des quartiers de Ciriri et Panzi dans la ville de Bukavu.

Résultats des infrastructures de forages et de distribution d'eau sont opérationnelles à Bukavu, Les habitants disposent d'une offre quotidienne d'eau en qualité et en quantilé, Les habitants et les acteurs clés de Bukavu sont sensibilisés, renforces dans leurs capacités pour mener les plaidoyers sur leurs droits fondamentaux. Les bénéficiaires conscientisés sont capables de revendiquer et de défendre leurs droits.

Notre projet est localisé en RD. Congo à l'Est dans la province du Sud Kivu ville de Bukavu. Depuis 1996, début de la guerre de libération a la tête le défunt Mzee Kabila. Les provinces du Nord et Sud Kivu n'ont jamais connu de paix, une série d'évènements douloureux se sont succédés et continuent dans la région du grands lacs. C'est le contexte dans lequel nos investigations ont été réalisées pour le projet. Il porte sur la problématique d'accès potable, assainissement et hygiène (ODD6) dans les quartiers Ciriri et Panzi. Bien que disposant d'une grande réserve d'eau douce, la problématique d'accès a l'eau potable demeure un défi majeur et La desserte nationale d'accès a l'eau potable est faible.

L'objectif du projet est d'améliorer les conditions d'aceès à l'eau potable et a l'assainissement pour les habitants de ces quartiers de la ville de Bukavu.

Nous sommes partis de l'idée de dire pourquoi les quartiers de CIRIRI et Panzi manquent de l'eau. Dans nos investigations de terrain, nous avons remarque que 30% de la population de la ville de Bukavu y vivent ces quartiers et pourquoi il y a une forte concentration de la population et une croissance démographique. La réponse est la majorité des habitants sont démunis et déplaces fouillant l'insécurité des milices et groupes armés dans les milieux ruraux. La surpopulation de ces quartiers est a la base de crise d'eau potable.

Groupes d'actions ciblées

- Améliorer la qualité de l'eau et la gestion des déchets, réduire les maladies liées à l'eau et les déchets
- Assurer l'accès universel à l'eau (dans les zones rurales).

Secteur/domaine: Accès à l'eau dans les zones de conflit en RDC.

Instances de mises en œuvre: ONG Santé et Education pour Tous (SET ONG), siège social à Kinshasa

Nature de l'organisme: ONG

Intervention zone: Congo

Justification: La République Démocratique du Congo a une superficie de 2 345 409 km^2 et partage 9165 kilomètres de frontières avec 9 pays voisins. Sa population est estimée à 85 millions d'habitants. L'Est du pays se compose de deux provinces Nord-Kivu et Sud-Kivul limitrophe de trois pays de la région, Burundi, l'Ouganda et la République Rwandaise. Depuis mille neuf cent quatre-vingt-seize(1996), début de la guerre délibération à la tête de Mzee Kabila, les deux provinces n'ont jamais connu la paix, une série d'évènements douloureux se sont succédé. C'est dans ce contexte de crises répétitives de l'eau, de l'assainissement. de l'instabilité et de la guerre que sera mis en œuvre le projet.

Niveau d'avancement: En cours de mise en œuvre

Type d'accompagnement souhaité: Financement/Technique/Visibilité/Promotion

Project to Support Income-Generating Activities for Women's Groups in the Thiès Department

Karelle Chryslene Ken
Nogeda, Thies, Senegal

For several years now, we have been facing a global environmental emergency, food insecurity and poverty, particularly in low-income countries. The marginalization of certain social strata and gender-related problems compounds these challenges. In this pre-existing alarming context, the COVID-19 pandemic has brought home the urgent need to prioritize local, ecological, and sustainable solutions. Faced with this multifaceted problem, we came up with this project, the main aim of which is to contribute to the development and socio-economic empowerment of women's groups, a veritable pillar of society, by proposing a local, community-based alternative including a "one health" approach. To achieve this objective, we have implemented the first phase of our project in the city of Thiès (Senegal). In the course of our various activities in the department, we noted the difficulties encountered by the population, particularly in terms of health and food, often linked to their low economic level, as well as their desire for improvement. We, therefore, selected six women's groups, which we will support over the course of 2021 through:

- Capacity building through training in the management of income-generating activities (IGA); market gardening and micro-gardening; poultry farming; the processing of cereals, fruit, and vegetables; the processing of detergent products;
- Support for the creation and development of IGAs: community gardens, poultry farming, processing of cereals, fruit and vegetables, and petty trading;
- Setting up a solidarity fund to enable beneficiaries to develop their IGAs through investment and innovation;
- At the end of this first phase, we noted a positive improvement within the various groups;
- The funds made available to them enabled them to increase their financial capacity and to invest more serenely in their IGAs;
- Thanks to the training they have received, these women are now making the most of their resources in the market-gardening sector and are planning to develop activities linked to poultry farming and the sustainable conservation of local produce.

Empowering women is an important step toward sustainable development. By supporting them in ecological activities, we can help to improve global health.

Projet d'Appui aux activités génératrices de revenu de Groupements de Femmes dans le département de Thiès

Authors

Karelle Chryslene Ken

Nogeda, Thies, Senegal

Dans un contexte déjà alarmant d'urgence environnementale mondiale, de pauvreté et d'insécurité alimentaire, la pandémie à Covid 19 a fait ressortir l'urgence de privilégier des solutions locales, écologiques et durables.

Face à cette problématique multiple, et devant la marginalisation de certaines couches sociales et les problèmes liés au genre notamment dans notre contexte socioculturel, nous avons pensé ce projet. Notre objectif principal étant de contribuer à l'épanouissement et à l'autonomisation socio- économique de groupements de femmes, véritable pilier sociétal, en proposant une alternative locale et communautaire incluant une approche « One Health ».

Afin d'atteindre cet objectif, nous avons implémenté dans la ville de Thiès (Sénégal) une première phase de ce projet. En effet au cours des diverses activités menées initialement dans le département, nous avons constaté les difficultés que rencontrent les populations locales particulièrement sur les plans sanitaire et alimentaire, souvent liés à leur faible niveau économique, ainsi que leur volonté d'amélioration. Nous avons ainsi sélectionné six groupements de femmes, que nous avons accompagnés au cours de l'année 2021 à travers:

- Le renforcement de capacités par la formation en : gestion d'activités génératrices de revenu (AGR) ; maraichage et micro jardinage ; aviculture et pisciculture ; transformation de denrées alimentaires (fruits, légumes, céréales).

- L'appui dans la création et le développement d'AGR : jardins communautaires, petits élevages, petits commerces.

- La mise en place d'un fond de solidarité, afin de permettre aux bénéficiaires de développer leurs AGR par l'investissement et l'innovation.

Au terme de cette première phase, nous avons noté une amélioration positive au sein des groupements concernés. En effet :

- Les fonds mis à leur disposition leur ont permis d'augmenter leur capacité financière et d'investir plus sereinement dans leurs AGR

- Grace aux formations reçues, ces femmes valorisent aujourd'hui leurs ressources locales, notamment dans le secteur maraicher. Elles envisagent aussi des activités liées à la transformation durable de produits locaux et préparent le développement de jardins communautaires incluant micro-agriculture et petits élevages, qui seraient de véritables poumons verts urbains et péri-urbains.

L'autonomisation des femmes est une étape importante vers un développement durable. En orientant les femmes vers des activités écologiques, locales et durables et en les encourageant par l'education et l'accompagnement, nous parviendrons à améliorer la santé planétaire.

La NOGEDA est une organisation à but non lucratif de portée africaine qui intervient en faveur des populations démunies et accompagne les jeunes dans la formation et l'insertion. Elle a pour principale mission de contribuer au développement économique, social et écologique de l'Afrique.

Prevalence of and Factors Associated with Depression, Anxiety, and Stress among Adolescents of Bangladesh during the COVID-19 Pandemic: A Population-Based Study

Maruf Haque Khan[1], M. Atiqul Haque[1], Mohd. Abdullah Al Mamun[2], Afifa Anjum[1], Mohammad Tanvir Islam[1], and Mohammad Robed Amin[3]

[1] Bangabandhu Sheikh Mujib Medical University, Shahbagh, Bangladesh

[2] National Heart Foundation Hospital and Research Institute, Mirpur, Bangladesh

[3] Directorate General of Health Services, Mohakhali, Bangladesh

In Bangladesh, during the COVID-19 pandemic, adolescents were especially in vulnerable conditions both physically and mentally. This study aimed to investigate the prevalence of and associated factors of depression, anxiety, and stress among adolescents in Bangladesh during COVID-19. This cross-sectional study uses a two-stage cluster sampling procedure for collecting the sample. A total of 2,030 adolescents (14-19 years) were enrolled from both urban and rural areas of eight administrative divisions of Bangladesh. The Depression, Anxiety, and Stress-21 (DASS-21) scale was used to assess depression, anxiety, and stress in adolescents. The outcome variables were depression, anxiety, and stress. Independent variables were age, sex, parental educational qualification, parental occupation, parental marital status, the total number of siblings and family members, residential area, insomnia severity index, food insecurity index, parenting style, screen-based behavior (using the computer, mobile phone, internet, social media), total weekly time spent on the internet, BMI, and BP. Linear regression was done to measure the risk factors. Ethical clearance was taken from the Institutional Review Board of BSMMU (memo no: BSMMU/2021/4408). The adolescent's mean (SD) age was 15.51 (1.32) years. The prevalence of depression, anxiety, and stress among urban and rural adolescents was 18%, 14%, and 16%, respectively. This prevalence is higher than the prevalence found in the National Mental Health Survey in Bangladesh in 2018–2019, and COVID-19 and its associated factors are thought to impact this. Female sex, age, urban residence, food insecurity, and poor parenting were significant risk factors for depression, anxiety, and stress during the COVID-19 pandemic. In addition, inconsistent parenting has been identified as a significant risk factor for depression only. There are some shortfalls in the study. The cross-sectional method of the study failed to identify the causal relationship with the factors related to depression, anxiety, and stress among adolescents. Additionally, collecting data from adolescents always involve recall bias along with misinterpretation of the terminology, which may lead to response bias. During the COVID-19 pandemic in Bangladesh, depression, anxiety, and stress were quite common among adolescents. As a result, quick action is required to prevent the mental health epidemic from spreading.

Prevalence of and Factors Associated with Depression, Anxiety and Stress among Adolescents of Bangladesh during the COVID-19 Pandemic: A Population-Based Study

Authors

Maruf Haque Khan[1], M. Atiqul Haque[1], Mohd. Abdullah Al Mamun[2], Afifa Anjum[1], Mohammad Tanvir Islam[1], and Mohammad Robed Amin[3]

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[2] National Heart Foundation Hospital and Research Institute, Mirpur, Bangladesh

[3] Directorate General of Health Services, Mohakhali, Bangladesh

Introduction

COVID-19 pandemic is going to impact various aspects of life including significant mental health challenges among the adolescents. A little research has been reported on the mental health status of Bangladeshi people during the COVID-19 pandemic, where there is a lack of data on adolescents.

Aim

This study aimed to investigate the prevalence and associated factors of depression, anxiety and stress among the adolescents of Bangladesh during COVID-19.

Materials and Methods

- multistage random sampling method was applied in this cross-sectional study.
- A total of 2,030 adolescents (14-19 years) were enrolled from four urban and four rural areas of eight administrative divisions of Bangladesh.
- Face-to-face interviews were conducted using Research Electronic Data Capture software through Computer Assisted Personal Interviewing.
- The Depression, Anxiety, and Stress-21 scale was used.
- The outcome variables were depression, anxiety and stress scores.
- Ethical clearance was taken from the local Institutional Review Board (Memo no: BSMMU/2021/4408).

Figure 1: Study places

Figure 2: Characteristics of the study participants

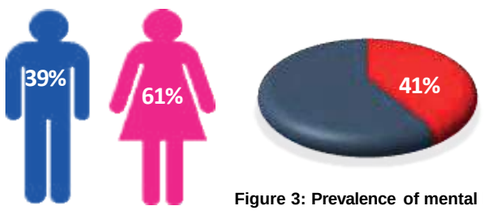


Figure 3: Prevalence of mental health disorders

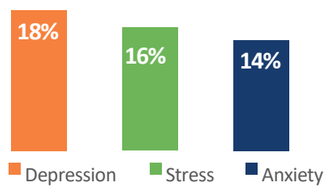


Figure 4: Prevalence of depression, anxiety, and stress

Table: Multiple linear regression analysis of factors associated with depression, anxiety, and stress among the participants (n = 2,030)

Variables*	Depression€ B (SE B)	Depression€ p-value	Anxiety£ B (SE B)	Anxiety£ p-value	Stress¥ B (SE B)	Stress¥ p-value
Constant	-5.95 (1.56)	<0.001	-5.07 (1.30)	<0.001	-2.33 (1.89)	0.218
Age in years	0.58 (0.09)	<0.001	0.48 (0.07)	<0.001	0.64 (0.10)	<0.001
Sex: Female (Ref. male)	1.41 (0.24)	<0.001	1.89 (0.2)	<0.001	1.89 (0.28)	<0.001
Parental marital status: Separated, widowed, divorced (ref. married)	1.67 (0.38)	<0.001	0.35 (0.32)	0.276	1.33 (0.46)	0.004
Number of siblings	0.01 (0.1)	0.934	0.01 (0.08)	0.918	-0.02 (0.12)	0.886
Residence: Urban (ref. rural)	1.71 (0.23)	<0.001	0.80 (0.19)	<0.001	2.62 (0.28)	<0.001
Food insecurity (ref. security)	2.44 (0.28)	<0.001	1.36 (0.24)	<0.001	2.30 (0.34)	<0.001
Positive parenting	-0.25 (0.05)	<0.001	-0.21 (0.04)	<0.001	-0.17 (0.06)	0.008
Inconsistent parenting discipline	-0.05 (0.04)	0.221	0.04 (0.03)	0.190	-0.14 (0.05)	0.002
Poor parental supervision	0.22 (0.04)	<0.001	0.09 (0.04)	0.008	0.04 (0.05)	0.516

€Depression, R2=.152, F (9, 2020) = 40.079, p < .001; £Anxiety, R2=.117, F (9, 2020) = 29.605, p < .001; ¥Stress, R2=.137, F (9, 2020) = 35.68, p < .001 Abbreviations: B, unstandardized regression coefficient; SE-B, standard error for the unstandardized regression coefficient; CI: Confidence interval

Discussion

- This is the first population-based study to identify the prevalence and risk factors associated with depression, anxiety, and stress among adolescents in Bangladesh.
- This prevalence is higher than the prevalence found in the National Mental Health Survey in Bangladesh in 2018-19, suggesting that the social isolation and worries about contracting COVID-19 have exacerbated these mental health issues.
- Its findings are certainly beneficial but should be interpreted considering some limitations.

✓ Specifically, owing to the cross-sectional nature of the study, it was not possible to determine causal relationships.

✓ There are risk of recall bias and response bias.

✓ Finally, type-1 error inflation could have been caused using multiple statistical tests without performing statistical correction of p-values.

Conclusion

Given that mental health problems during adolescence increase the risk of adult mental distress, responsible authorities must take immediate action if we are to avert a mental health epidemic in the post- COVID era.

Acknowledgments: This study was funded by the Directorate General of Health Services of the Ministry of Health and Family Welfare, Bangladesh. The funder has no role in design, analysis, and interpretation of the work.

Determining Spatial Heterogeneity in the Prevalence of Anemia among Women Aged 15-49 in India for the Years 2019–2021

Ashi Khare, Thirumal Vennam, Dripta Roy Choudhury, Amit Arora, and Satish Agnihotri
Indian Institute Of Technology Bombay, Mumbai, India

Anemia is a major public health concern in India, and nutritional anemia accounts for about 70% of anemia prevalence among Indian children and adolescents. The fifth round of the National Family and Health Survey (NFHS-5), 2019–2021 depicts a 4% increase in the prevalence of anemia among Indian women (57%) in the past few years. This study determines the spatial heterogeneity in the prevalence of anemia among women aged 15-49 years using the NFHS-5 data. Online-available NFHS-5 data are used for analysis. The prevalence of anemia among 15-49-year-old women in India was mapped using QGIS. Univariate local indicators of spatial analysis (LISA) were applied to identify the hotspots of high anemia prevalence among women. Bivariate LISA was used to assess spatial autocorrelation between women's anemia and different risk factors (independent variables). Moran's I value of univariate LISA for 707 districts of India is 0.688 ($p \leq 0.05$), which indicates that anemia among women is spatially clustered. About 132 districts (about 18.6%) are found in the hotspot region (high-high clusters), which are concentrated in Assam, Bihar, Chhattisgarh, Gujarat, Jharkhand, Odisha, and West Bengal, while 91 districts (about 12.8%) are found in cold spots (low-low clusters). Bivariate LISA depicts anemia among women to be spatially autocorrelated with child anemia, women's BMI, and literacy (child anemia: Moran's I = 0.45, $p \leq 0.05$; women's BMI: Moran's I = 0.33, $p \leq 0.05$; women's literacy: Moran's I = -0.31, $p \leq 0.05$). This analysis suggests that there is heterogeneity in the anemia prevalence among 15-49-year-old women in India. The high-burden clusters need immediate and prioritized interventions. Current supplementation and fortification practices alone may not be able to reduce the anemia prevalence in these clusters and need a review of strategies urgently. This analysis can help bring focus on implementing preventive measures in low-burden clusters, which may prove to be economically efficient and fruitful in addressing micronutrient deficiencies in the long term. This is particularly relevant in the post-pandemic years, where preventive public health measures will need to come to the center stage of health policy rather than the curative ones.

Determining Spatial Heterogeneity in the Prevalence of Anaemia among Women aged 15-49 in India for the Years 2019–2021

Authors

Ashi Khare, Thirumal Venam, Dripta Roy Choudhury, Amit Arora, and Satish Agnihotri

Centre for Technology Alternatives for Rural Areas, IIT Bombay, Mumbai, India

Aim: To determine the spatial heterogeneity in the prevalence of anaemia among women aged 15-49 years using the recent National Family and Health Survey (NFHS-5) 2019-21 data.

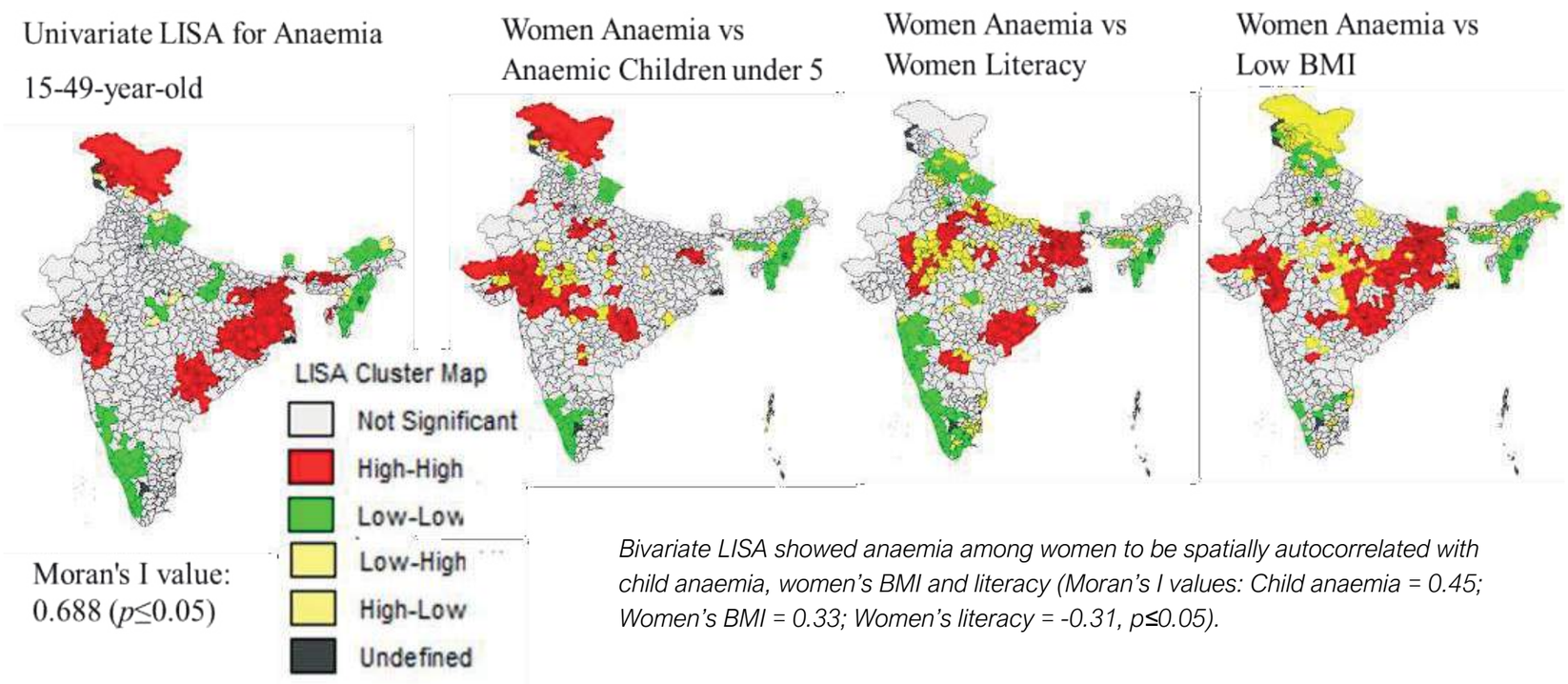
Introduction

Anaemia is a condition marked by low haemoglobin (Hb) concentration and is a serious public health concern in India.(CNNS,2019). Every second woman in the country is anaemic!(NFHS-5, 2021). Iron deficiency is the strongest predictor of anemia among adolescents in India. (Lahiri et al., 2020). Low Dietary intake of iron from cereal based Indian diets

(7-10mg/meal) with less bioavailable (<5%) non-heme iron content are few of the prominent causes. (Nair et al., 2016). Various government policies involving supplementation and fortification exist but fail to have desired impact. (Anand et al., 2014).

Methods

Online available NFHS-5 data is used for analysis. Prevalence of anemia among 15-49y women in India was mapped using QGIS. Univariate local indicators of spatial analysis (LISA) was applied to identify the hotspots of high anemia prevalence among women. Bivariate LISA was used to assess spatial autocorrelation between women's anemia and different risk factors (independent variables).



Bivariate LISA showed anaemia among women to be spatially autocorrelated with child anaemia, women's BMI and literacy (Moran's I values: Child anaemia = 0.45; Women's BMI = 0.33; Women's literacy = -0.31, p≤0.05).

Conclusions

- There is heterogeneity in the anaemia prevalence among 15-49 y old women in India.
- Focusing on improving health and awareness/literacy among anemic women likely to help in reducing prevalence among children.
- Current supplementation and fortification practices alone may not enough.
- The high burden clusters need immediate interventions, while focusing on low burden clusters may prove to be economically efficient in the long term.
- Study is relevant in the post pandemic years where preventive measures need to be highlighted rather than the curative ones.

Acknowledgements

1. Prof. Satish B. Agnihotri and Prof. Amit Arora, CTARA, IITB, IndiaGHF 2022 Grants

CommunityFirst Paradigm Shift as Decolonised Approach to Humanitarian Emergency Response

Rachel Kiddell-Monroe
SeeChange Initiative, Montreal, Canada

The COVID-19 pandemic has revealed the limits of humanitarian crisis response. For many Indigenous, displaced, and other vulnerable communities, humanitarian assistance either never arrives, arrives too late, or is imposed on communities without regard for their needs, priorities, cultures, and assets. This presentation aims to explain the CommunityFirst (CF) approach, which addresses this gap and shows how sustainable and community-owned solutions provide vulnerable communities the agency to respond to their health crises their way. Our CF approach recognizes that when the community leads and owns its health crisis response, the impacts are more effective and appropriate. This, in turn, makes crisis responses more lasting and replicable. CF is defined as a cycle of engagement, co-creation, and reflection to leverage a community's agency and resources before, during, and after a health crisis. Our CF approach brings forward adaptive solutions to health crises that are desired, designed, and owned by communities themselves. This methodology supports communities in 12 countries across the Americas and Africa to respond to health crises, including tuberculosis and COVID-19. Currently, we are expanding this approach in Latin America with Doctors Without Borders, and our results from this collaboration will be shared during this event. Since 2018, we have seen many qualitative results, including community leaders feeling more equipped to organize, prepare and respond to health crises, as well as improved emotional health and well-being during crisis response, stronger community health advocacy, and greater community awareness of prevention strategies. One issue in humanitarian assistance is questioning the value of quantitative results in monitoring and evaluation. The question is, what results and outcomes need to be measured that focus on what the community needs and wants? Further, vulnerable communities often lack the financial resources to lead their own crisis response. Leveraging the concept of trust-based funding, we discuss how to ensure independent sources of income are managed by the community to respond to health crises as they arise. By sharing a new framework for humanitarian action, we can impact how humanitarian organizations work, how communities demand their place in an emergency response, and how global policymakers fund humanitarian responses.

CommunityFirst Paradigm Shift as Decolonised Approach to Humanitarian Emergency Response

Authors
Rachel Kiddell-Monroe

SeeChange Initiative, Montreal, Canada

SeeChange seeks to invigorate vulnerable cmmunities to address humanitarian health crises. Our purpose is guided by our values of humanity, solidarity, humility and dignity.

Our objective is to co-design solutions with communities that leverage their agency and resources before, during and after a humanitarian health crisis.

Since 2018, we have accompanied over 20 communities in Argentina, Canada, Colombia, Ghana,Guatemala, Honduras, Kenya, Mexico, Peru, Sierra Leone and Venezuela

1.

- A digital planning guide;
- An open-sources database of resources.

2.

- Virtual orientations;
- Community workshops;
- Direct support for community activators;

3.

- Partner organizations;
- CommunityFirst activators.

Better Insight into the Epidemiology of Crimean–Congo Hemorrhagic Fever Virus in Corsica (France): A One Health Approach

Paloma Kiwan[1] , Vincent Cicculli[1,2], Morena Gasparine[1], Remi Charrel[2], and Alessandra Falchi[1]
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[2] Unité des Virus Emergents (UVE), Aix-Marseille Université, IRD 190, INSERM 1207, IHU Méditerranée Infection, Marseille, France

Nowadays, emerging pathogens with vector transmission are of major importance. Corsica, a Mediterranean island, is characterized by several factors supporting the spread of vector-borne diseases. Mass tourism and extensive agriculture favor interactions between humans, livestock, and wild fauna. Moreover, Corsica, located on the avian migration route, allows the transport of new invasive tick species. Favored by global warming, ticks succeed in settling and circulating new diseases, including Crimean–Congo hemorrhagic fever (CCHF). CCHF is a common zoonotic viral infection transmitted by ticks. In 2016, human cases were detected in Spain. CCHF was also detected in ticks in Spain and Italy. In Corsica, domestic animals, seropositive for this virus, are detected in cattle (13%) and sheep (2,5%). However, no human clinical cases have been reported to date. Furthermore, CCHF is not detected in ticks circulating in Corsica despite the large circulation of its main vector, Hyalomma marginatum. It is necessary to strengthen the preparation for CCHF emergence. Molecular detection of the CCHF virus in ticks collected from domestic animals will be conducted in parallel with an 18-month epidemiological survey targeting populations at high risk for CCHF infection (farmers, slaughterhouse workers, and their families). A questionnaire will be conducted to assess exposure factors in these populations, and serum samples will be collected to calculate the prevalence of CCHF and compare it to the general population. Investigating the dynamics of an epidemic as a whole through a One Health approach is critical to understand the situation of CCHF in Corsica and closely monitor its possible emergence.

Better Insights into the Epidemiology of Crimean–Congo Hemorrhagic Fever Virus in Corsica, France: A One Health Approach

Authors

Paloma Kiwan[1], Vincent Cicculli[1,2], Morena Gasparine[1], Remi Charrel[2], and Alessandra Falchi[1]

[1] UR7310 BIOSCOPE, Laboratoire de Virologie, Université de Corse-Inserm, 20250 Corte, France
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Introduction: Emerging Diseases

Among pathogens responsible for emerging infectious diseases, those with vector transmission are of major importance.

Crimean-Congo hemorrhagic virus (CCHF)

The most widespread tick-born human disease, due to the extensive geographical distribution of its principal vector Hyalomma marginatum. CCHF is a zoonotic infection, asymptomatic in reservoir animals but responsible for moderate to severe hemorrhagic disease in humans, with a lethal rate reaching 40%.

CCHF is studied in many Mediterranean countries

Study objective: Strengthen the preparation for CCHF emergence via a OneHealth approach.

CCHF in Corsica?

No human cases to date

2014

CCHF antibodies detected in cattle (13%) and sheep (2,5%)

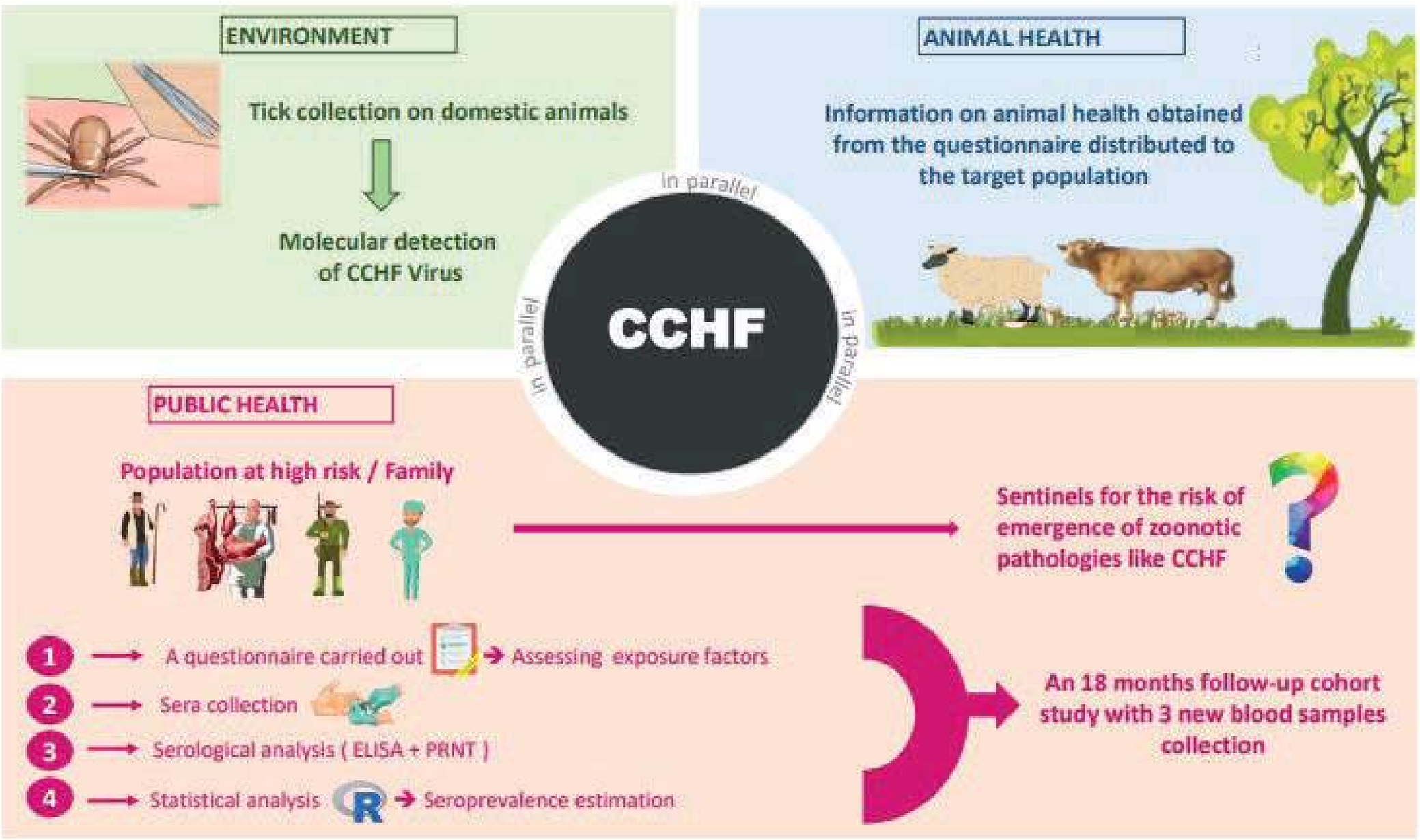
2016

Tick surveillance (n=9000) No CCHF detected

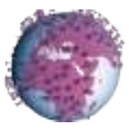
No close nairovirus detected

2021

Methods



Importance



Evaluate the source of a possible CCHF epidemic.

Evaluate the exposure factors
Put in place preventive measurements

Raise public health awareness in Corsica and neighboring regions.

Feasibility Study for the Implementation of the One Health Concept in Togo (2023–2024)

Nyazoudema Serge Michel Kodom
Aimes-Afrique (International Association of Physicians for the Promotion of Education and Health in Africa), Lome, Togo

The COVID-19 pandemic human public health crisis caused by a virus with potential animal origin has underscored the relevance of the "One Health" concept in understanding and addressing global health risks. In Togo, the lack of sanitation causes the death of approximately 20,000 children under the age of 5 each year. This study aims to assess the motives of the low level of understanding of the concept by the actors and propose concrete solutions to remedy it. The methodology used in the context of our feasibility study is based on documentary research, interviews with experts and communities, and elements of surveys. In view of our feasibility study, the following results emerge: more than 30% of health personnel and 40% of health authorities questioned have no notion of the "One Health" concept; health workers recognize that the deterioration of the state of health of populations with the emergence and increase of pathologies has a close link with environmental health; lack of health professionals capable of ensuring effective and efficient implementation of the concept; populations ignore the "One Health" concept and ignore the environmental effects on human and animal health. The particularity of this study lies in the fact that it took into account the grassroots populations because, without their involvement, "One Health" would only be a pipe dream. As advocated by "One Health," any profound change requiring a paradigm shift requires the great involvement of communities who must prepare for a change in behavior beyond the efforts of health actors and administrative and political authorities. Together with partners, from this study, two main conclusions emerged:

- Implementation of "One Health" is not effective in Togo despite the commitments made by the authorities;

There is a need to set up a training center or an environmental health research institute to effectively and efficiently implement the "One Health" concept.

Etude De Faisabilite Sur la Mise en Oeuvre du Concept "One Health" au Togo (2023-2024)

Authors

Nyazoudema Serge Michel Kodom

Aimes-Afrique (International Association of Physicians for the Promotion of Education and Health in Africa), Lome, Togo

One Health Au Togo
Avec le soutien de Aimes • Afrique Suisse

Peer Groups for Primary Healthcare Providers in Ukraine: Professional Development and Burnout Prevention during the COVID-19 Pandemic

Olga Korolenko, Tetiana Stepurko, Martin Raab, and Renato Galeazzi
Ukrainian-Swiss Project "Medical Education Development", Swiss TPH, Kyiv, Ukraine

The peer groups (PGs) for primary healthcare (PHC) providers were launched in Ukraine in 2020 as a continuing professional development (CPD) activity. The aim of this study is to assess the experience of participants on the PGs' role in professional development. The case study approach was applied for data collection and analysis. The feedback and reporting forms collected from PGs participants were the first source of data. The presented cases during the First Ukrainian Congress of PGs Facilitators in October 2021, regular discussions during supervision meetings provided information on how PGs contribute to the quality of CPD, motivation, interaction in teams, and burnout prevention. PGs are small groups of specialists with equal positions who meet regularly to discuss their medical practice critically and learn from each other's experience to improve the quality of care [1]. Currently, around 50 PGs for PHC professionals operate in Ukraine, covering around 500 participants. At the beginning of the COVID-19 pandemic, PG meetings were frequently devoted to cases of COVID-19 patients, vaccination, and coordination between different healthcare levels. This helped PHC professionals to update knowledge timely, reduce the stress level, and develop action plans for the facilities. For a long time, PG meetings were the only offline CPD format available for PHC professionals, which ensured regular skills building and experience sharing. Among the PGs' key advantages, physicians mention active communication, the possibility to learn from each other and to strengthen relationships in teams. For nurses, this format became a possibility to study continuously as other options are limited in Ukraine for them, as well as feel more competent and confident. PGs seem to be an important contribution to CPD in Ukraine and address those challenges that require urgent communication, knowledge, and experience sharing. Also, this format contributes to better interaction in a team.

Peer Groups for Primary Healthcare Providers in Ukraine: Professional Development and Burnout Prevention during the COVID-19 Pandemic

Authors

Olga Korolenko, Tetiana Stepurko, Martin Raab, and Renato Galeazzi

Ukrainian-Swiss Project "Medical Education Development", Swiss TPH, Kyiv, Ukraine

Background

A Ukrainian–Swiss Medical Education Development Project, implemented by Swiss TPH under financial support from the Swiss Development Cooperation Office, launched the peer groups for primary health care (PHC) providers in Ukraine in 2020. Peer groups are seen as one of the continuing professional development (CPD) activities for health care providers. Before 2020, this CPD format was not present in the country at all, for either nurses or doctors. The peer groups format changes the approach of medical professionals towards their CPD. They become proactive and ready to take on a leading role in and responsibility for their learning.

Figure 1. Peer group from Lviv.

Peer groups are small groups of specialists with equal positions who meet regularly to critically discuss their medical practice and learn from each others' experiences to improve quality of care. [1].

Study Design

The aim of the study is to assess the experience of peer group members regarding the peer groups' role in their development, in professional life and beyond.

The study applies a case study methodology, and data comprise the feedback and reporting forms from peer group facilitators and members. Also presented are cases from during the training, meetings, and supervisory sessions providing additional information on how peer groups contribute to the quality of CPD, the motivation of PHC professionals, and interactions in teams.

Figure 2. Map of the distribution of peer groups for medical professionals across Ukraine.

Implementation Process

- Winter 2020 – concept development and facilitators' training preparation by the Medical Education Development project.
- Spring 2020 – re-design of the training for peer groups facilitators, transforming into an online format because of the COVID-19 pandemic.
- June 2020 – the first online training session for peer group facilitators: 18 graduates – PHC doctors and nurses.
- Autumn 2020 – the first peer groups are operational: 5 groups for PHC doctors, and 4 groups for nurses.
- Winter 2021 – the second online training session for new facilitators: 23 graduates.
- Spring-Summer 2021 – two more training sessions for new peer group facilitators in partnership with USAID project Health Care Reform Support in Ukraine: 35 graduates.
- October 2021 – the First Congress for peer group facilitators for further training, experience exchange, and community building.
- Winter 2022 – 50 PGs for PHC professionals are up and running in Ukraine, covering at least 500 participants.

Peer groups continued to operate during martial law, as they were among the limited CPD options available for medical professionals.

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Figure 3. Peer groups from Kharkiv, Chernivtsy, Rivne, Kherson.

Implementation Results

Peer groups proved to be accessible, flexible, and tailored to the real needs of medical professionals. During the COVID-19 pandemic, peer group meetings were the only possibility for medical professionals to meet offline and to learn and share key updates on COVID-19 treatment in real time. During the military invasion of Russia, peer groups have become a unique opportunity for lots of medical doctors and nurses to continue CPD at the workplace or online, in cases where medical professionals have been temporally displaced.

- *'This is a great opportunity to get together, discuss important topics, learn, and immediately implement new things into practice', Yulia Nechyporuk, family doctor, Rivne city.*
- *'It is almost for the first time we are learning really important things for our practice. I like that we can ourselves decide on the topics of the peer group meetings', Leonid Melnyk, Ladyzhynka village, Cherkasy region.*
- *'COVID-19 treatment was a very important and urgent topic to discuss. Thank you for bringing us together and sharing this knowledge. I was looking for this information for some time already', family doctor, Chortkiv town, Ternopil region.*

Among the key advantages of peer groups, medical professionals also mention open communication, reduction in stress levels, and team building, which leads to burnout prevention, as there is a safe space within medical facilities to share concerns and look for solutions for existing problems, as well as to devote time to special training to prevent professional burnout.

- *'Peer group gave our team a possibility to be more open in our communication and discussions of clinical cases. We could build trust. That's why our doctors are getting more ready to share their doubts and even mistakes, as they see there is no judgment or punishment. Previously it was impossible' Natalia Tunik, peer group facilitator, Novotroitske village, Kherson region.*
- *'Peer group meetings give us emotional recharge and allow us to communicate openly', Maria Bilozir, nurse, Lviv city.*

Figure 4. Peer group facilitators, Autumn 2021.

Conclusions

Peer groups contribute significantly to the development of CPD systems for medical professionals in Ukraine. In particular, they address challenges which require urgent communication between colleagues, or knowledge and experience sharing under unpredictable circumstances. Also, this format contributes to better interaction in a team, ensures trust- building, and ensures the delivery of necessary support in crisis situations and burnout prevention.

Peer groups have raised a lot of interest from medical professionals and promote the further development of the medical professional community in Ukraine.

Acknowledgments

The peer groups were launched by the Ukrainian-Swiss project "Medical education development", funded by the SDC, and later supported by the USAID project "Health Care Reform Support". The Project is financed by the Swiss Agency of Development and Cooperation. Views and ideas published here belong to the author(s) and do not necessarily reflect views of the Swiss Agency of Development and Cooperation.

Schweizerische Eidgenossenschaft
Confédération suisse
Confederazione Svizzera
Confederaziun svizra
За підтримки Швейцарії

Swiss TPH
Swiss Tropical and Public Health Institute
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MEDICAL EDUCATION DEVELOPMENT

Digital Capacity Building of Front-Line Workers for Improving Care and Development of Young Children Amid COVID-19

Harish Kumar[1] and Devina Bajpayee[2]
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Appropriate nutrition and nurturing care in the first 1000 days go a long way in helping children thrive. Realizing its economic, nutritional, and other benefits, India strengthened its home-based newborn care (HBNC) through additional visits and launched a program called "Home Based Care of Young Child" (HBYC) in 2017. Under this program, a community health worker conducts home visits for all children in her area at the 3rd, 6th, 9th, 12th, and 15th months of age. Implementing HBYC is a challenge due to a large number of functionaries needing capacity building and large monitoring data. The problem was further exacerbated during the COVID-19 pandemic with various restrictions. IPE Global, supported by USAID, shouldered the responsibility to support alternate modes of capacity building amidst the pandemic. A web-based learning management system (LMS) was developed in partnership with Laerdal Global Health for the capacity building of front-line workers in three districts of Jharkhand. The state HMIS revealed that 48% of community workers were trained on HBYC at baseline in the three identified districts. The LMS was introduced with state-level trainers and ASHA supervisors (who also work as trainers for their colleagues). Out of the 181 ASHA facilitators in the three districts, 52 used the LMS for self-learning in the first three months. An assessment carried out three months later revealed a significantly higher knowledge level on diarrhea and pneumonia management, referral indications, and parenting tips, even though the training duration with the e-module is shorter (50%) than the earlier traditional training. Further, the state government's approval of LMS for scaled-up use for training ASHAs has resulted in the initiation of training of 3191 untrained ASHA workers in the state. The tool prompts role clarity and prompts front-line functionaries to comply with various counseling actions, including reporting, and has improved real-time data submission and analysis. Data of 20,788 home visits covering 58% of children registered are now available. The digital solution has demonstrated potential for mainstreaming HBYC and building capacity and compliance for data reporting by front-line health workers to maximize the benefits of the 1000-day window period for improving child health outcomes in LMICs.

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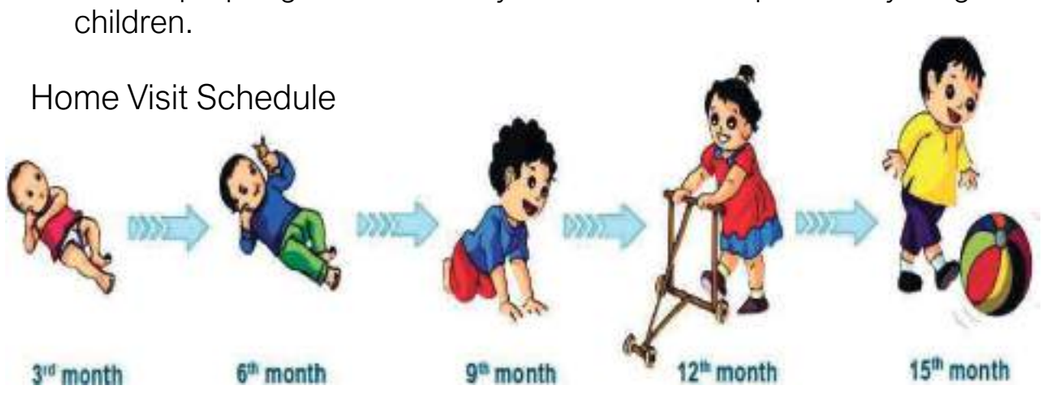
Home-Based Care for Young Children

The platform uses structured home visits by ASHAs to young children of 3 to 15 months of age.

Objectives

- Reduce child deaths and illnesses;
- Improve nutritional status of young children;
- Ensure proper growth and early childhood development of young children.

Home Visit Schedule



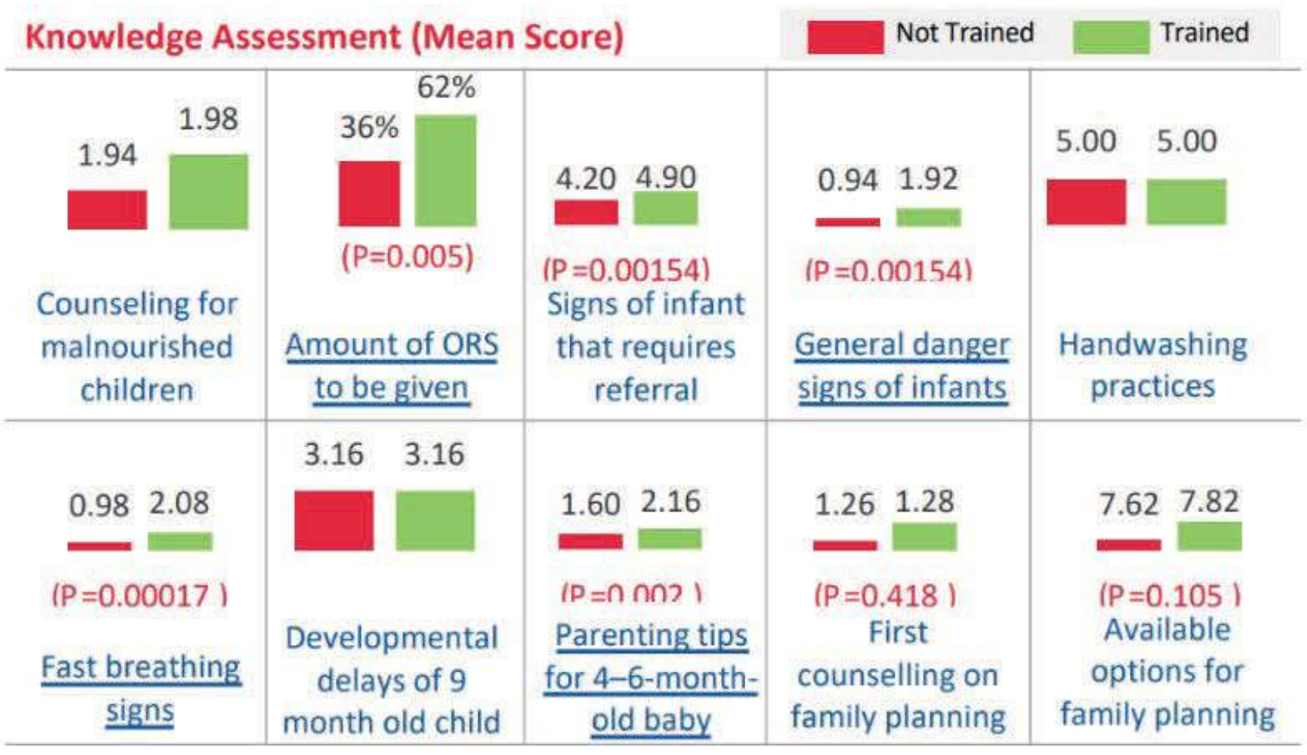
The COVID-19 pandemic exposed system fault-lines.

- COVID-19 pandemic restrictions:
- Lockdowns;
- Travel restrictions;
- Restrictions on large group gatherings;
- Restrictions on physical training.

- The traditional model of capacity building was not available: quality service provision.
- Weaknesses in the availability of monitoring data, including supply-side readiness challenges.
- Delays in the payment of performance-linked incentives to workers.
- Weak program monitoring for responsive action.

E-LMS

- 12000 ASHAs have been trained using the e HBYC LMS; The module is being scaled up to other states.



e-Reporting

Timely report submission | Client registry | Real time data | Improved program management | Line-list for targeted action

1. Malnourished children;
2. Children with developmental delay;
3. Sick children who have been referred;
4. Children not fully immunized.

- The community workers found the data tool easy to use –63% of workers using tool;
- There was improved real-time data submission and reporting;
- Data of 20,788 home visits covering 58% of children registered are now available.

Potential Advantages of E-HBYC

Client Registry

Details of each child available. Targeted action enabled

e-Learning

Reduces training time. Reduces training cost. Feasible despite travel restrictions.

e-Reporting

Reduces paperwork. Leads to timely submissions.

Improves activity linked performance incentives.

Real Time Data

Real time data available for timely action improved program management

Timely payment of incentives to workers

Learning which can be replicated during the pandemic and beyond!

Frontline workers comfortable with e-tools

Tablet ANMOL

Improved data Improved program

Line list of U5 children

Win-Win Partnerships

USAID – IPE Global Laerdel

Capacity Building

- Shortened training.
- Improved knowledge of FLWs.
- E module for reference empowers frontline workers.

Improved Program Management

- Timely reports and analyzed data for responsive action.
- Timely performance -based incentives to field workers.

Taken to scale

- Leveraged resources.
- Being scaled up by MP Government.

SAMVEG: Systems Approach for MNCH focusing on Vulnerable Geographies In Association with

Low Temperature Kills Babies! Gaps in Neonatal Thermal Care in Low-Resource Settings: A Web-Based Survey of Healthcare Workers

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Hypothermia has been widely regarded as a major contributory factor to neonatal mortality and morbidity in low-resource settings. Despite the recognition of the importance of thermal care for neonates a century ago and the established WHO guidelines, a high prevalence of neonatal hypothermia is still regularly reported. Indeed, it should be regarded as a neglected disease. Hypothermia is avoidable in the majority of neonates because it is not a complication of prematurity but is more the result of inadequate thermal care. The objective of this study was to explore the current gaps in knowledge and practice in neonatal thermal care among healthcare workers in low-resource settings. We conducted a two-round, web-based survey of a purposive and snowball sample of healthcare workers in neonatal care in low-resource settings. The questionnaire was developed using themes of neonatal thermal care extracted from existing neonatal care guidelines, including WHO's. The survey asked multiple-choice questions, supplemented by open-ended questions to capture first-hand insights and information on neonatal thermal care. The results of the survey were analyzed using Microsoft Excel. Data were collated and summarized using descriptive measures.

Almost all participants acknowledged the importance of all the WHO warm chain elements; however, fewer participants responded positively regarding the practice of this warm chain. Only 56% of the participants acknowledged the usefulness of checking the hand or foot temperature by hand touch. The usefulness of the axillary or rectal temperature was valued higher than that of the hand or foot temperature as an indicator of cold stress. Opinions diverged regarding the hand or foot temperature, including apparent inaccuracy compared to axillary or rectal temperature. Preferences for rewarming strategies widely differed among participants, and so did the availability of warming equipment in their institutions. We identified the general acknowledgment of the importance of the WHO warm chain but also its limited practice. We also identified that an inadequate understanding of cold stress underestimates the potential benefits of the hand or foot temperature and leads to missed opportunities for timely prevention of hypothermia. Furthermore, the lack of consistent guidance on equipment for rewarming hypothermic neonates hampers recovery.

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Context

2.4m babies die within 28 days of birth every year[1]

99% of deaths occur in low- and middle-income countries[2]

80% of neonates who died had hypothermia[3]

Thermal care guide WHO

Warm chain including skin- to-skin care: an effective means of thermal care for clinically stable neonates

HYPOTHERMIA is preventable

COLD HANDS and FEET are a sign of COLD STRESS

- a condition in which neonates are below optimum environmental temperature and using oxygen and energy for heat generation.4

Objective

- Understand gaps in knowledge and practice in neonatal thermal care in low-resource settings;
- Capture first hand insights and information on neonatal thermal care.

Methods

- A two-round web-based survey of healthcare workers in low-resource settings;
- Questionnaire based on themes of WHO's neonatal thermal care guidelines;
- A self-administered questionnaire.

References

1. UNICEF et al. Levels & Trends in Child Mortality. 2021.
2. Lawn JE, et alJ. Lancet. 2005; 365: 891–900.
3. Demtse AG et al. Glob Pediatr Heal. 2020;7: 1-8.
4. IUPS Thermal Commission. Jpn J Physiol. 2001; 51(2): 245-280.

Participants

In total, 88 participants from South and Southeast Asia and Sub-Saharan Africa

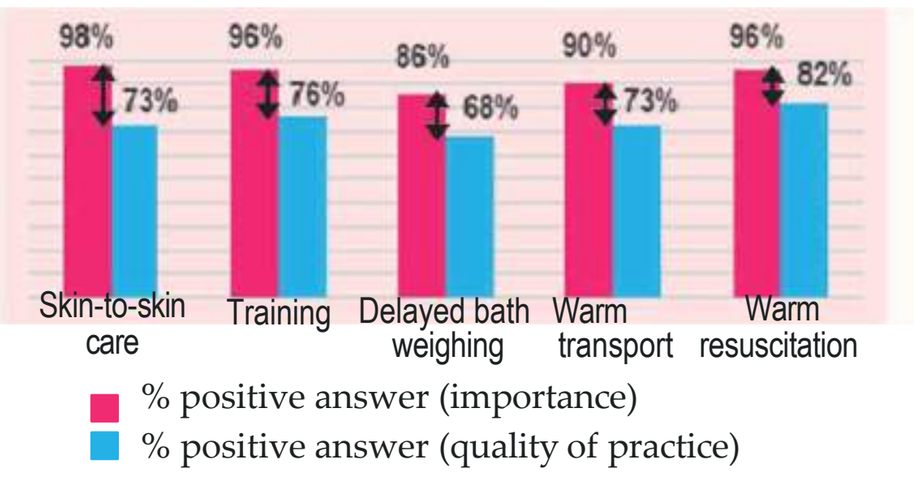
Results 1

1 in 3 physicians answered "checking the hand or foot temperature by hand- touch is USELESS".

Results 2

GAPS!

Acknowledged IMPORTANCE and quality of PRACTICE of the WHO warm chain



NOTE: five elements with the biggest differences between 'importance' and 'quality of practice' were extracted.

Results 3

Participants' opinions differed in

- preference
- availability
- perception

} of warming equipment

Conclusion

COLD STRESS Healthcare workers need to:

- understand cold stress;
- acknowledge the benefits of hand and foot temperatures;
- respond to cold stress before hypothermia occurs

WARM CHAIN: Quality of practice needs improvement.

CONSISTENT GUIDANCE on WARMING EQUIPMENT is necessary for efficient and effective thermal care.

Challenges of Engaging Actors via a Co-Design Process: The Case of the PREZODE (Preventing Zoonotic Disease Emergence) International Initiative

H. Ladreyt, M. Olive, M. Peyre, N. Rousseau, M. Lounas, C. Grimaldi, B. Roche, G. Vourc'h, E. Bohin, M. Trouillet, JF. Soussana, P. Dussort, V. Lecointe, G. Blandin, S. Signoret, and the PREZODE consortium

The PREZODE (preventing zoonotic disease emergence) initiative aims to catalyze joint actions in order to improve surveillance, risk mitigation, and early warning systems for zoonotic emergencies, adapted to local socio-economic contexts in co-construction with local actors and decision-makers, especially in high-risk areas. A strong ambition of PREZODE is to be co-designed with all relevant stakeholders, between health sectors (animal, human, and environment), researchers, field operators, decision-makers, and between private and public sector actors, from local to international levels. This co-design process must allow, on the one hand, to define the generic scientific and operational framework of the initiative, adapted to all regions of the world, but also the specific modalities of its implementation in each region to prevent zoonotic disease emergence. From June to November 2021, a series of online regional iterative workshops following a standardized participatory method were implemented to 1) define and share a common vision of the initiative, its main objectives, expected impacts, and potential obstacles, 2) identify all the relevant actors and the changes in practices needed to ensure adoption of risk reduction and prevention solutions, 3) identify the activities to be implemented to promote such changes and develop innovations, from local to national, regional, and then global, and 4) to identify the research gaps and cutting edge in science to reach a low level of zoonotic emergence. The data generated from the workshops were literally transcribed and analyzed, accounting for biases of participation and representativeness linked to this large-scale and online co-design process. In addition, a structured questionnaire was sent to all workshop participants to assess their interest in this innovative process and to evaluate its strengths, weaknesses, and usefulness in the co-design of PREZODE. Three phases of nine regional workshops (West Africa, Austral and East Africa, Central Africa, North Africa and Mediterranean, Southeast Asia, Indian Ocean, Latin America and Caribbean, Europe, and USA) were then carried out, and gathered more than 1000 contributors from 130 countries, from academic/research (59%) but also policy fields (27%), operational (8%), and private sectors (6%). The global common vision of PREZODE was expressed as "a world without pandemics, where food safety, environmental protection, surveillance of zoonoses emergence and community inclusion is ensured by taking into account the inclusion of communities in a local to global approach". A total of 39 main obstacles to reaching the regional common vision were sorted into 19 categories of main obstacles, and 462 root obstacles were sorted into 101 categories of root obstacles. Nine categories of main obstacles cut across several regions, including lack of intersectorality and interdisciplinarity, economic issues, political issues, and socio-cultural issues. In addition, several categories of root obstacles cut across several main obstacles, such as education and training issues, lack of bottom-up approaches, and community inclusion, which therefore seem appropriate to work on first in order to unblock sets of main obstacles. All the elements generated during this co-design process will allow identifying operational actions and research questions to develop the PREZODE scientific strategic agenda, which will be validated by all the workshop participants, experts, and decision- makers. This agenda will allow us to define the most relevant activities to be implemented in the next 30 years to prevent disease emergence risks.

Challenges of Engaging Actors via a Co-Design Process: The Case of the PREZODE (Preventing Zoonotic Disease Emergence) International Initiative

Authors

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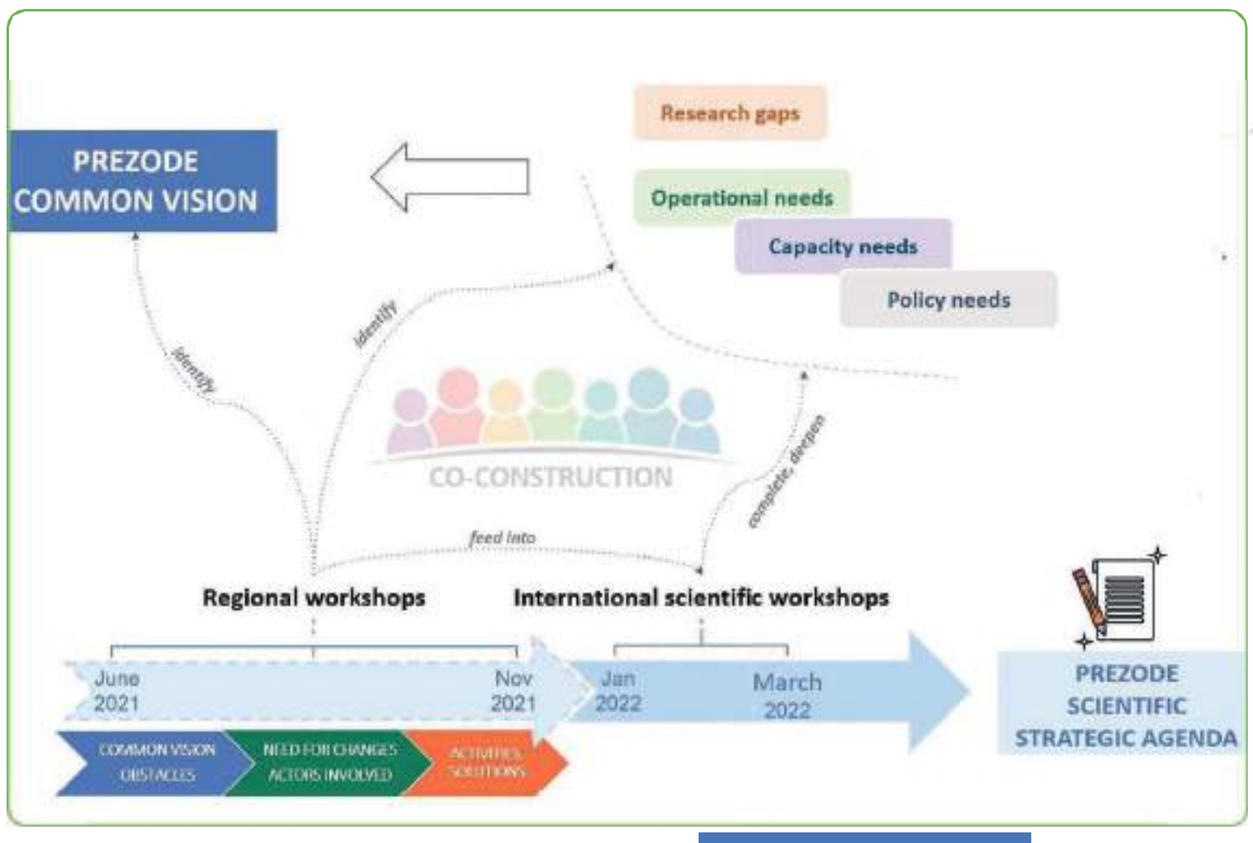
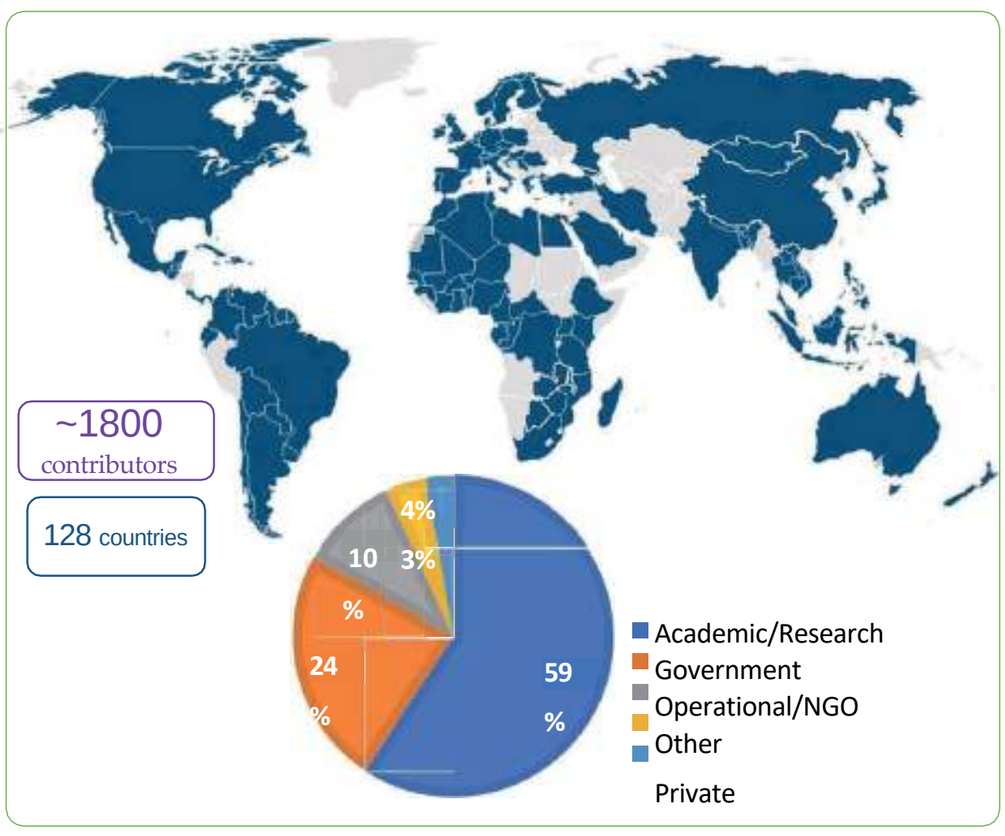
Background

The PREZODE (for Preventing ZOonotic Disease Emergence) initiative aims to catalyze joint actions in order to improve surveillance, risk mitigation and early warning systems for zoonotic emergence, adapted to local socio-economic contexts in co- construction with local actors and decision-makers, especially in high-risk areas. A strong ambition of PREZODE is for it to be co-designed with all relevant stakeholders, between health sectors (animal, human and environment), researchers, field operators, and decision-makers and between private and public sector actors from local to international levels. This co-design process must allow the generic scientific and operational framework of the initiative to be defined and adapted to all regions of the world, and also for the specific modalities of its implementation in each region to also be defined to prevent zoonotic disease emergence.

Materials and Methods



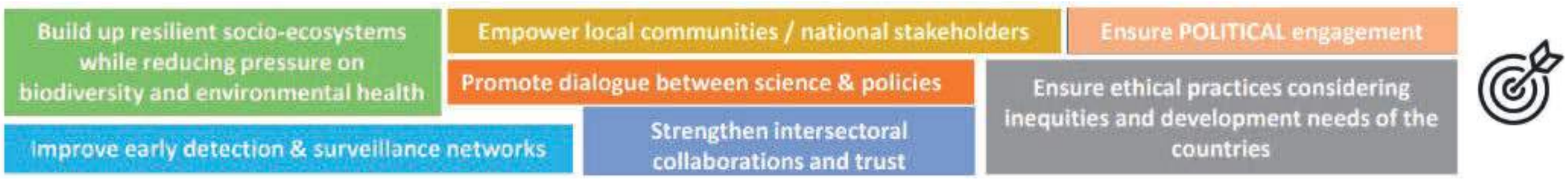
Results and Participation



PREZODE COMMON VISION "a world without pandemics, where food safety, environmental protection, surveillance of zoonoses emergence and community inclusion is ensured by taking into account the inclusion of communities in a local to global approach"

Results: Vision and Outputs

More precisely, participants agreed on the need to...

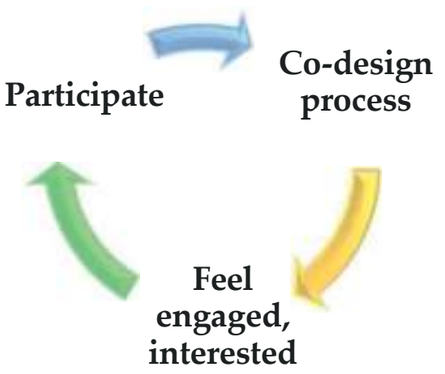


...in order to better prevent zoonotic diseases emergence.

Next, participants identified change needs, solutions, and activities to achieve these goals, which are currently being analyzed to identify research, operational, policy, and capacity needs.

Discussion and Perspectives

Co-design process methodology = federate and bring people around the table to deconstruct and reconstruct the problem together ➔ actors' engagement in the initiative.



Online workshops: digital tools ➔ setting up large-scale workshops (international, significant financial savings compared to face-to-face workshops) -> identification of numerous large- scale and more specific research gaps and operational needs.

The long process with many steps:

*impatience of participants to see the result of their involvement strong need for feedback and communication;

*lots of data to be analyzed (>6000 ideas exchanged), which can be heterogeneous strong need for briefing and support for workshop facilitators.

➔Bring the process to the national level to reinforce actors' engagement and to specify research gaps and operational needs at a lower scale.

➔Research, operational, policy, and capacity needs will be listed in the PREZODE scientific strategic agenda (to be released fall 2022), which will be validated by all the workshop participants, experts, and decision makers. This agenda will allow the identification of the most relevant activities to be implemented in the next 30 years to prevent disease emergence risks.

Challenge of the process: The PREZODE team would like to warmly thank all the participants in the co-construction workshops for their time and their involvement in the process.

PREZODE
Preventing zoonotic disease emergence

Modeling Japanese Encephalitis Virus Transmission Dynamics and Human Exposure in a Rural Cambodian Multi-Host System

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Japanese encephalitis (JE) is a vector-borne zoonosis and the leading cause of acute human encephalitis in Asia. Its epidemiological cycle is usually described as involving wild birds as reservoirs and pigs as amplifying hosts. JE is endemic in Cambodia, where it circulates in areas with low pig densities and could be maintained in a multi-host system composed of pigs but also poultry as competent hosts and dogs, cattle, and humans as non-competent hosts. We developed a mathematical model representing Japanese encephalitis virus (JEV) transmission in a traditional Cambodian village (calibrated with field data collected in three districts of Kandal province) to assess the capacity of the epidemiological system to sustain JEV transmission in villages in the three districts (based on R0), and to quantify human exposure. Changes in farm density and agricultural practices, climate, or epizootics (e.g., African swine fever), can profoundly alter the composition of host communities, which could affect JEV transmission and its impact on human health: we used the model to analyze how host community composition affected R0 and human exposure. Lastly, we evaluated the potential use of dog JE seroprevalence as an indicator of human exposure to JEV. In the modeled villages, the calculated R0 ranged from 1.07 to 1.38. The predicted annual probability of human exposure ranged from 9% to 47% and the predicted average age at infection was low, between 2 and 11 years old, highlighting the risk of severe forms of JEV infection and the need to intensify child immunization.
According to the model, increasing the proportion of competent hosts induced a decrease in age at infection, thus the potential clinical impact on children's health. The simulations also showed that JEV could invade a pig-free multi-host system, suggesting that poultry might act as reservoirs. Finally, the annual human exposure probability appeared linearly correlated with dog seroprevalence, suggesting that in our specific study area, dog seroprevalence would be a good proxy for human exposure.

Modeling Japanese Encephalitis Virus Transmission Dynamics and Human Exposure in a Rural Cambodian Multi-Host System

Authors

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[5] Epidemiology Unit, Laboratory for Animal Health, ANSES, Maisons-Alfort, France.

Background

Japanese encephalitis (JE) is a vector-borne zoonosis and the leading cause of human acute encephalitis in Asia. Its epidemiological cycle is usually described as involving wild birds as reservoirs, pigs as amplifying hosts and Culex spp mosquitoes as vectors. JE is endemic in Cambodia, where it circulates in areas with low pig densities and could be maintained in a multi- host system composed of pigs, but also involves poultry as competent hosts and dogs, cattle and humans as non-competent hosts.

➔ Capacity of the epidemiological system to be invaded by JEV and sustain virus transmission in villages (R0)?

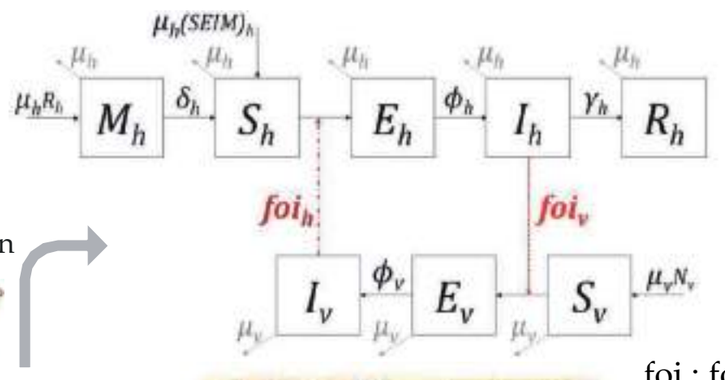
➔ Quantification of human exposure in Kandal villages?

➔ How host community composition affects R0 and human exposure?

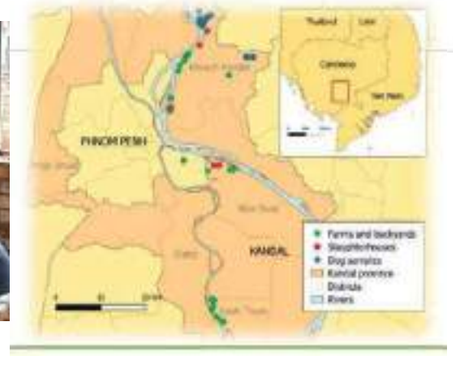
➔ Could dog JE seroprevalence be used as an indicator of human exposure to JEV?

Culex tritaeniorhynchus

Materials and Methods



Model calibration



foi : force of infection

v : vector

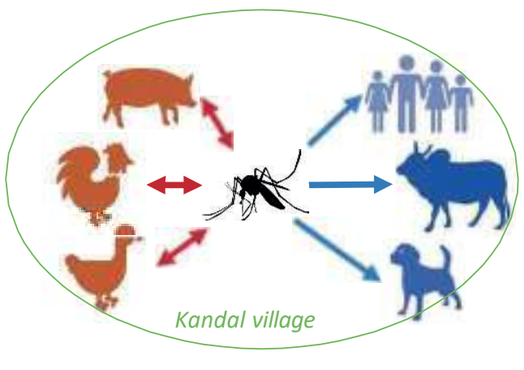
h : host

Indicators estimation

R0

Probability of human exposure
Incidence rate of human infections Average age at infection

Village/multi-hosts system composition can impact indicators



Dogs as a proxy for human exposure? : Dog seroprevalence

X

Probability of human exposure

Results

In a traditional village of Kandal province:

R_0	1.1-1.4
Exposure probability	9-47 %
Incidence	24-56 people/village/year
Age at infection	2-11 years old

R_0 is princially influenced by the proportion of pigs in the system. Scenario B, **0 pigs : $IC_{95\%}$ R_0 includes 1** !

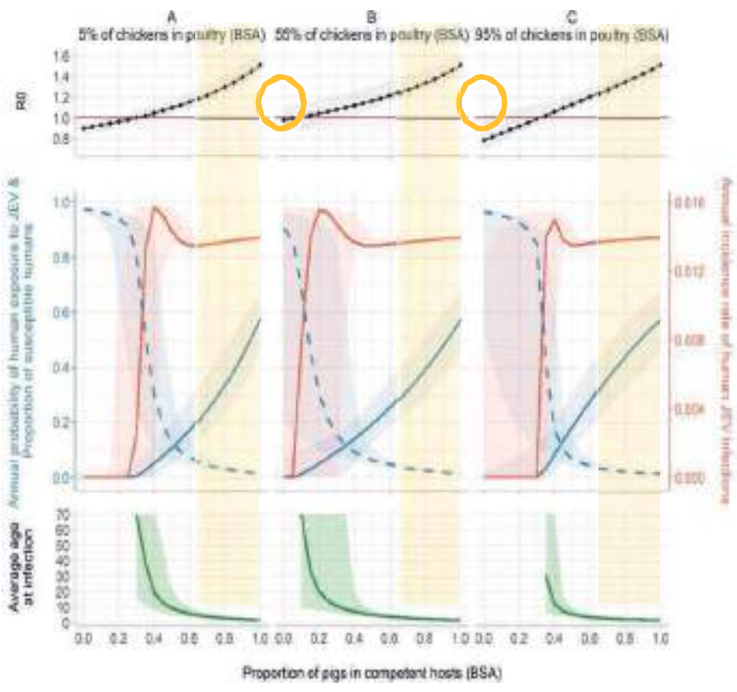
Probability of human exposure ↗

Average age at infection ↘

Incidence rate ~

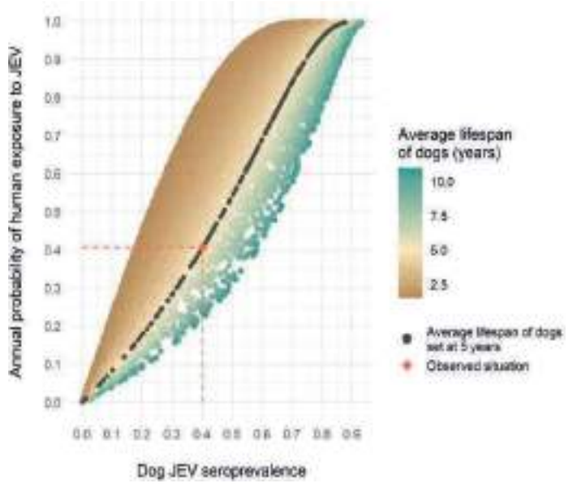
➔ Infections affect young people

Village/multi-host system composition modification:



Three estimated indicators and the proportion of susceptible humans (dashed blue line) at the epidemiological equilibrium, according to the proportion of pigs in competent hosts in terms of body surface area (BSA) for three fixed percentages of chickens among poultry. Total BSA of hosts and the size of vector population (48, 663 mosquitoes, 95% CI: 40, 347-58,863) remained constant.

Dog seroprevalence as a proxy for human exposure?



Annual probability of human exposure to JEV according to dog JEV seroprevalence.

Discussion and Perspectives

*First JEV model calibrated on field data in Cambodia that suggest a quantification of human exposure;

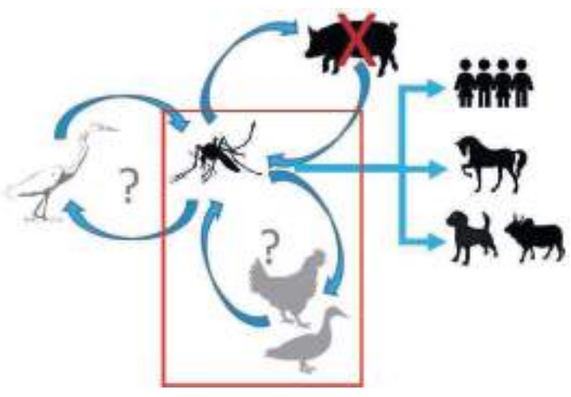
*Poultry potential reservoir of JEV;

*Estimated incidence of infection in Kandal: 14 infections for 1000 habitants/year;

*Clinical cases incidence? : 1/500 to 1/250 of infections would be symptomatic (hospital-based data).

➔3/100 000 to 6/100 000 clinical cases/years in Kandal.

Average age at infection low ➔ severe cases ➔ intensify vaccination of children in Cambodia



The Influence of the Environment on Teleworking Practices During the COVID-19 Health Crisis

Satya Lancel and Draushika Mooruth
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The study focuses on the working conditions and quality of life experienced by teleworking employees during the 2020–2021 health crisis. The objectives of the study are to explore 1) the impacts of telecommuting on quality of life, work efficiency and productivity, health at work, professional relations, and work/life balance and 2) list the conditions for successful telecommuting in the future. The survey was carried out in March 2021 among all employees of a French private-sector company. The results of the study are based on 1,611 usable responses from teleworking employees to a 43-question questionnaire. In the questionnaire, employees filled in various fields relating to the working environment. The results show that 86% of employees claim to have accommodation suitable for teleworking. However, the results also show that almost half of employees do not have a separate room in which to telework. Data analysis reveals the environment's influence on quality of life, social relationships, feelings of efficiency, and health. Indeed, teleworking in a separate room in the home significantly influences the balance between personal and professional life: very good balance for 61% of employees who have a separate room versus 42% for those who do not. What is more, employees who declare that their working environment does not allow them to telework adequately experience a greater deterioration in professional social relations, a lower sense of quality of life, a deterioration in sleep quality, a rise in stress levels, and cognitive overload. As telecommuting becomes more widespread, the work environment needs to adapt to the new professional practices it implies. The study reveals three areas for improvement in tomorrow's teleworking practices.

The Influence of the Environment on Teleworking Practices During the COVID-19 Health Crisis

Authors

Satya Lancel and Draushika Mooruth

Laboratory Epsylon, University Montpellier III, France

Introduction

The present study examines the relationship between working conditions and the quality of life of employees during constrained teleworking due to the COVID-19 health crisis.

Aim

To explore the impacts of teleworking on occupational health.

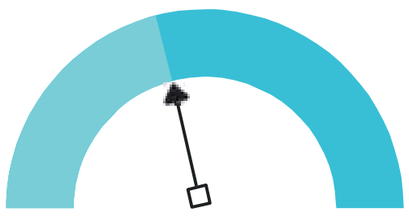
Method

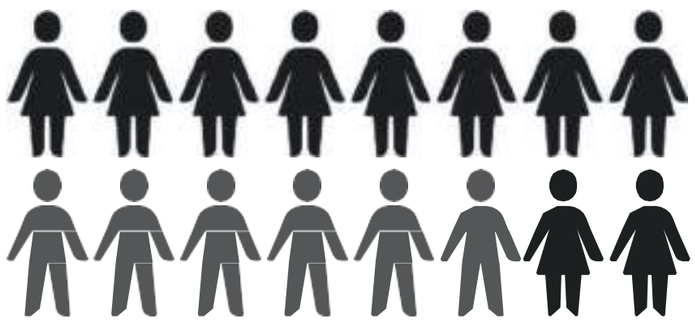
A large scale survey was conducted among 1611 employees of a private sector firm, through a questionnaire.

Results

Workers' capacities for constrained teleworking were positively associated with the possibilities offered by their environment, thus resulting in more positive psychological well-being.

Do you have a separate room for teleworking?





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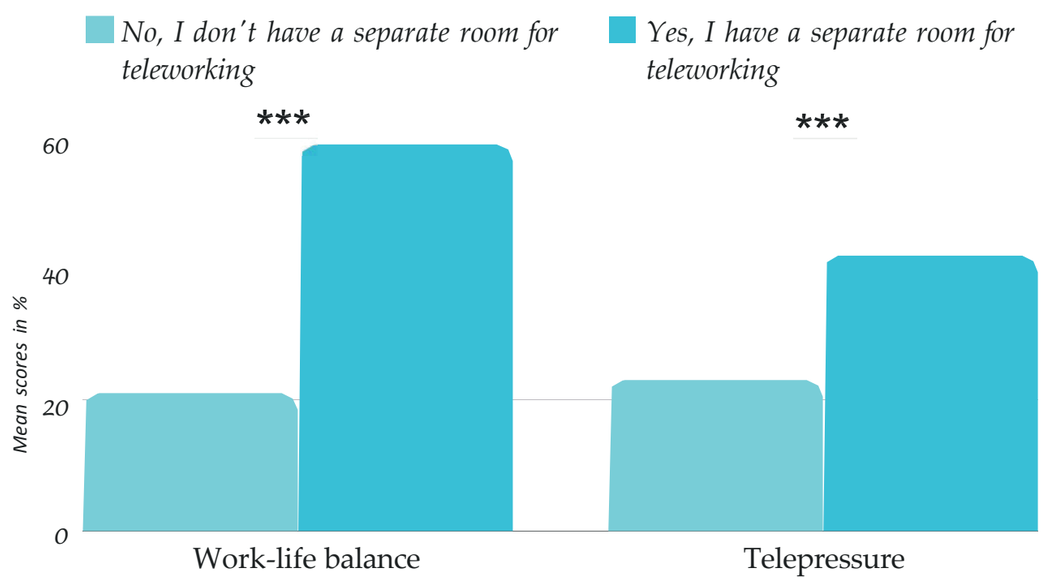

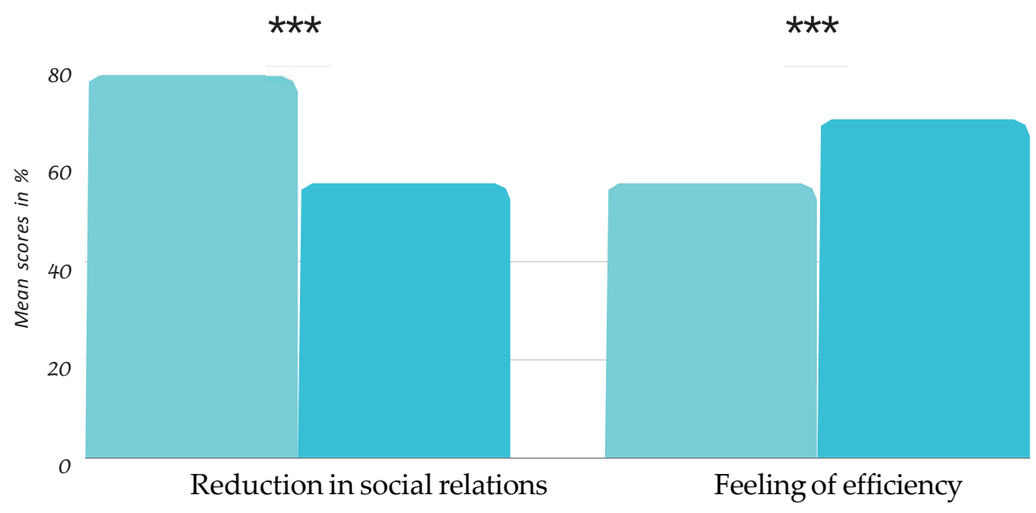

Teleworkers' response rates to occupational health indices via the spatial distribution of housing during the health crisis (%).

Conclusions

The teleworking environment has an effect on occupational health, suggesting that workspace designs for teleworkers should be considered, not only for future social restrictions, but also for the telework of tomorrow.

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COOPERATIVE U ENSEIGNE

LABORATOIRE EPSYLON UNIVERSITE MONTPELLIER III FRANCE

The Perinatal Experience of Migrant Women: A Qualitative Study Based on the CDSS Conceptual Framework

Emma Leavy and Delphine Coulon

Haute Ecole De Santé, Geneve, Switzerland

Maternity remains a public health issue worldwide. Societal disparities exert an influence on health, particularly that of women in Switzerland concerning pregnancy and childbirth. How can we reduce these differences in health risk among socially and economically differentiated population groups? Is the concept of social inequality in health really taken into account in Geneva's healthcare system? This is a study of social inequalities in health according to the WHO Commission on Social Determinants of Health (CSDH). A comprehensive, semi-directive interview is used to understand the experiences of this population and to facilitate the implementation of social programs and public policy strategies adapted to their needs. The CDSS demonstrates that social inequalities in health are due to insufficient social programs at the political level. It also asserts that 70% of health status can be explained by structural determinants (social stratification) and that the comprehensive interview can reveal a wider set of consequences due to structural differences. Two interview grids were constructed.

Eight women and five health professionals took part in the research. The women were of Afghan, Albanian, Indian, Congolese, and Iranian origin. All had migrated to Geneva within the last five years and shared their experiences of pregnancy and childbirth in Geneva. Three midwives, a nurse, and a doctor took part. The type of residency permit, which depends on the reason for immigration, has a significant impact on the living and health conditions of migrant women. The CDSS defends the importance of considering equity during pregnancy, an important factor in fetal development. However, maternal stress, malnutrition or undernutrition, and an uncertain and unstable living environment are all experienced in Geneva by the migrant population and represent factors of inequality in health. An approach based on the WHO's CDSS conceptual framework would help to reduce health disparities in the population.

Le vécu périnatal des femmes migrantes : Etude qualitative selon le cadre conceptuel de la CDSS

Authors

Emma Leavy and Delphine Coulon

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Résumé

Cette étude s'intéresse au ressenti des femmes issues de la migration. Plusieurs mères ont été interviewées sur la prise en soins de leur grossesse et accouchement à Genève, avec divers origine. Des professionnels de santé – médecin, infirmier et sage-femmes – ont également participés. Les données se sont construites sur la base d'entretiens semi- directifs lors desquels des thèmes tels que la communication, le pouvoir décisionnel, les évènements de vie ainsi que la situation sociale et de vie actuelle ont été abordés. Ce travail est élaboré en regard du cadre conceptuel de la Commission des Déterminants Sociaux de la Santé et démontre que le secteur des soins a seulement peu d'influence sur la santé et l'égalité d'accès aux soins. Une angoisse et d'autres symptômes dépressifs sont péjorés chez les mères par d'autres secteurs politiques. Il existe peu de protection des travailleurs sans-papiers ce qui engendre une négligence de l'état de santé. L'ensemble des professionnels de santé disent ne pas avoir le bagage nécessaire pour une prise en soins de qualité.

Problématique

En Suisse, le risque de mortalité maternelle est quatre fois plus élevé chez les femmes migrantes que chez les Suissesses (1). Ces femmes ont plus tendance à abandonner la chaîne thérapeutique, elles se sentent souvent inhibées en raison d'un manque de soutien social (2). Les Nations Unies considèrent l'égalité sociale en santé comme un pilier fondamental du développement, « les inégalités représentent une menace pour le développement économique et social » (3). Elles affirment aussi que « nous ne pouvons pas parvenir au développement durable et rendre la planète meilleure pour tous si des personnes n'ont pas accès aux possibilités, aux services et à la chance d'avoir une vie meilleure.» (3).

Quel est le vécu des femmes issues de la migration en soins périnataux à Genève ? Quelles inégalités sociales en santé et d'accès aux soins subissent-elles?

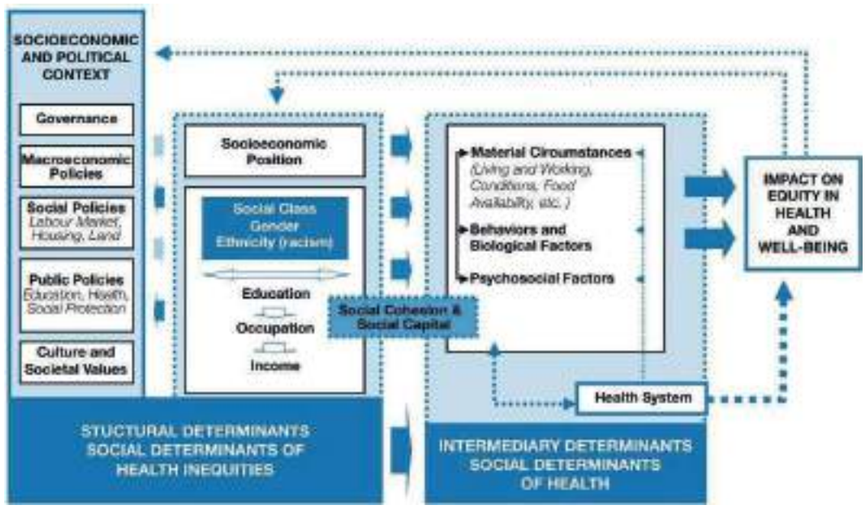
Méthodologie

L'études'est déroulée à Genève en 2020. Les femmes interviewées sont d'origines afghanes, albanaises, indiennes, congolaises ou iraniennes.

Cadre théorique

En 2005, l'OMS répond aux inquiétudes des inégalités sociales à travers la Commission des Déterminants Sociaux de la Santé (CDSS) (3), permettant de réunir l'ensemble des connaissances en matière de déterminants sociaux de la santé.

Le cadre théorique de la CDSS se décline en deux composantes: les déterminants structurels, qui englobent le contexte socio-économique et politique, et les déterminants intermédiaires.



Le concept d'une approche globale de santé apparaît dans les années 70' au Canada. Cette idée se développe à travers divers auteurs. Elle mène aux notions d'équité en santé et d'inégalités sociales en santé, permettant de définir le cadre conceptuel de la Commission des Déterminants Sociaux de la Santé de l'OMS.

Résultats & Discussion

1. Un lien direct existe entre la politique de migration & d'asile et la santé de la population issue de la migration.
2. La problématique de désertification du cadre institutionnel favorise le fossé existant autour de la santé dans la population.
3. Les concepts défendus par la CDSS ne sont pas entièrement pris en compte dans le système de soins et d'intégration genevois.

En lien avec la problématique de manque de neutralité, des ateliers réflexifs sont proposés aux interprètes par le Bureau d'Intégration des Etrangers dans le cadre de l'AIS (4)-

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Oil Extraction Kills

Aude Martenot, Luisa Sanchez, and Olivia Albertoni
Centrale Sanitaire Suisse Romande, Genève, Switzerland

Oil activities in the Ecuadorian Amazon are causing disastrous environmental impacts and damaging the health of indigenous populations. The latter are fighting for their rights, demanding ecological redress and compensation for their own health. In 2016, the Centrale Sanitaire Suisse Romande was asked by a local association, Clínica Ambiental, to support a care project for people suffering from cancer and other serious illnesses. Through a poster presenting the context and this project, we wish to demonstrate the interweaving of the ecological struggle and the fight for access to healthcare for all. We will be emphasizing the centrality of the gender issue because women are the first to be affected by ecocides, but also because they still shoulder the majority of domestic and care tasks. The project finances the creation of health centers in affected areas, the training of therapists to monitor patients, and the recording of cancer cases. At the same time, the project supports community-based reparation committees to strengthen social ties and ensure local accountability and decision-making. Indirect activities include training people in permaculture and lobbying the authorities. The arrival of the pandemic hindered the project, with the loss of certain state subsidies, the reallocation of medical resources leaving other diseases to be dealt with, and patients' fear of leaving their homes to seek treatment. Nevertheless, the recognition of therapists' status is having a positive impact on the community.
The project also promotes gender equality, as many of the therapists and most of the victims are women. Last but not least, the existence of the ecological disaster is becoming increasingly visible through the communities' advocacy actions, including in the context of the access to care project. The project is helping to address the problem of environmental injustice by acting on the health and social fronts. It is guided by a multi-sectoral struggle initiated by local players who have been committed for years.

L’extraction pétrolière tue!

Authors

Aude Martenot, Luisa Sanchez, and Olivia Albertoni

Centrale Sanitaire Suisse Romande, Genève, Switzerland

Les activités pétrolières en Amazonie équatorienne causent des impacts environnementaux désastreux et portent atteinte à la santé des populations autochtones et paysannes des zones affectées.

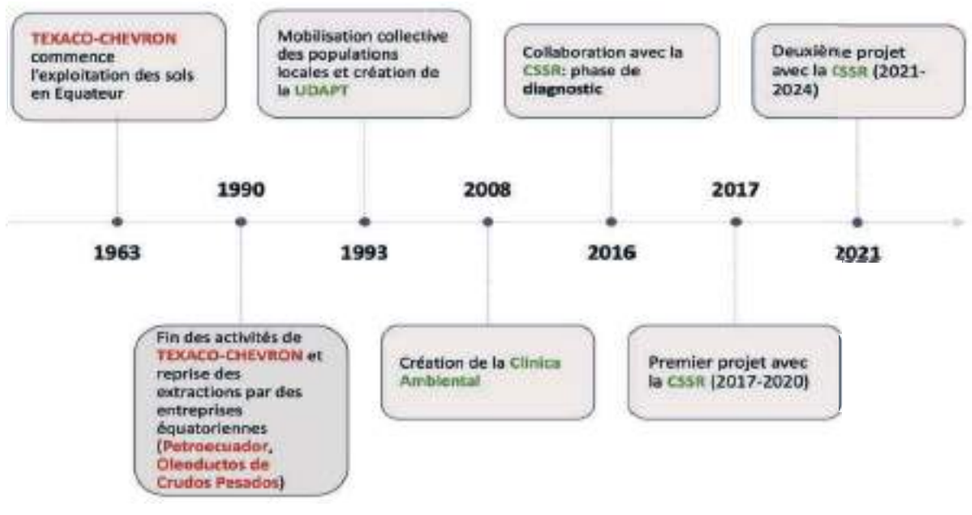
+ de 60'000 millions de litres d’eau polluée déversée dans la nature

+ de 30'000 personnes affectées par la pollution pétrolière

+ 130% de cas de cancer en plus dans la région impactée qu’au niveau national

Contexte

Dès les premiers impacts environnementaux, les populations locales se mobilisent et mènent, jusqu’à aujourd’hui encore, un long combat de justice, environnemental et sanitaire.



Activities

Depuis 2016, la CSSR soutient un projet qui se focalise sur 3 activités:

- Former des **thérapeutes** pour suivre les patient·es atteint·es de cancer et recenser le nombre de cas de cancer
- Constituer des **comités de réparation** dans les communauté
- Réaliser un **plaidoyer** auprès des autorités

Resultats

En 2020, se termine la première phase, les résultats positifs du projet permettent de relancer une deuxième phase de trois ans dès 2021.

+ Au total: suivi et soins à 256 patient·es

  Diagnostic de cancer à 197 de ces patient·es

+ Engagement d’un oncologue par l’hôpital

+ **Reconnaissance** de l’utilité des **thérapeutes** pour le suivi des soins et dans leur fonction sociale

− 2021 : COVID, frein technique et manque de personnel

Inegalites de Genre

⇒ Assumant majoritairement les tâches domestiques et de soins, les femmes sont les premières affectées par les écocides.

⇒ Les femmes sont plus nombreuses en tant que patientes et thérapeutes. La dimension de genre est donc centrale dans le projet.

Centrale Sanitaire Suisse Romande
ENGAGEE POUR LA SANTE !

Enfants du Monde in Times of COVID-19: A Quick, Collaborative and Adapted Reaction as Part of the Ministries of Health's Preparedness and Response Plan

Clara Mayer[1], Asadur Rahman[2], Konica Gop[2], Dadjoari Moussa[3], Pascal Ouedraogo[4], Tougma Téné Sankara[1], Anna-Ligia Molina[1], Cecilia Capello[1], Simone Arcila[1], and Mouna Al Amine[1]

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[2] BRAC Health, Nutrition and Population Programme (HNPP), Dhaka, Bangladesh

[3] Department of Family and Health, Ministry of Health of Burkina Faso, Ouagadougou, Burkina Faso

[4] Initiative Privée et Communautaire pour la Santé et la Riposte au VIH/SIDA au Burkina Faso (IPC/BF), Ouagadougou, Burkina Faso

In March 2020, the world passed a crucial period for COVID-19 (COVID). In Bangladesh, Burkina Faso, El Salvador, and Haiti, where Enfants du Monde (EdM) helps Ministries of Health (MoH) to improve Maternal and Newborn Health (MNH), the number of cases increased. To support health systems to implement their Strategic Preparedness and Response Plan and ensure MNH continued to be high on the agenda, EdM adapted its programs. This presentation shows that existing trust relationships and collaborative efforts enable the provision of quick and adapted responses against COVID. EdM relocated funds/received additional funds to support the MoH 1) to rapidly provide specific information to the population on MNH and COVID when there was limited information available, and 2) to provide protective equipment for healthcare providers and communities. In Bangladesh, BRAC and EdM informed community leaders and health workers, trained primary care providers on MNH/COVID, and developed communication materials. In Burkina Faso, Initiative Privée et Communautaire and EdM integrated information on COVID on the distance-learning platform for healthcare providers, designed posters on COVID prevention measures and SMN, disseminated messages on radio stations and megaphones at the community level and developed an APP for women. In El Salvador, a leaflet on COVID and MNH was designed and distributed to women. In Haiti, Médicos del Mundo and EdM designed and distributed posters in Creole. EdM and its partners supported the supply and distribution of protective equipment (masks, goggles, protective clothing) for first-level care providers. EdM's health program has been impacted by COVID: staff were infected/quarantined; stock-outs of protective materials delayed the deliveries; MoH mobilized its human resources in the management of COVID and had limited availability for other aspects; technical support could only be provided remotely. A total of 972,132 women, newborns, and healthcare workers/providers in Bangladesh, Burkina Faso, El Salvador, and Haiti benefited from this support. This was possible thanks to trust relationships with partners and MoH and the capacity of EdM for rapid mobilization of technical staff within its own network. These efforts enabled a quick/adapted response to support our partners in the countries of intervention in their fight against COVID.

Enfants du Monde in Times of COVID-19: A Quick, Collaborative and Adapted Reaction as Part of the Ministries of Health's Preparedness and Response Plan

Authors

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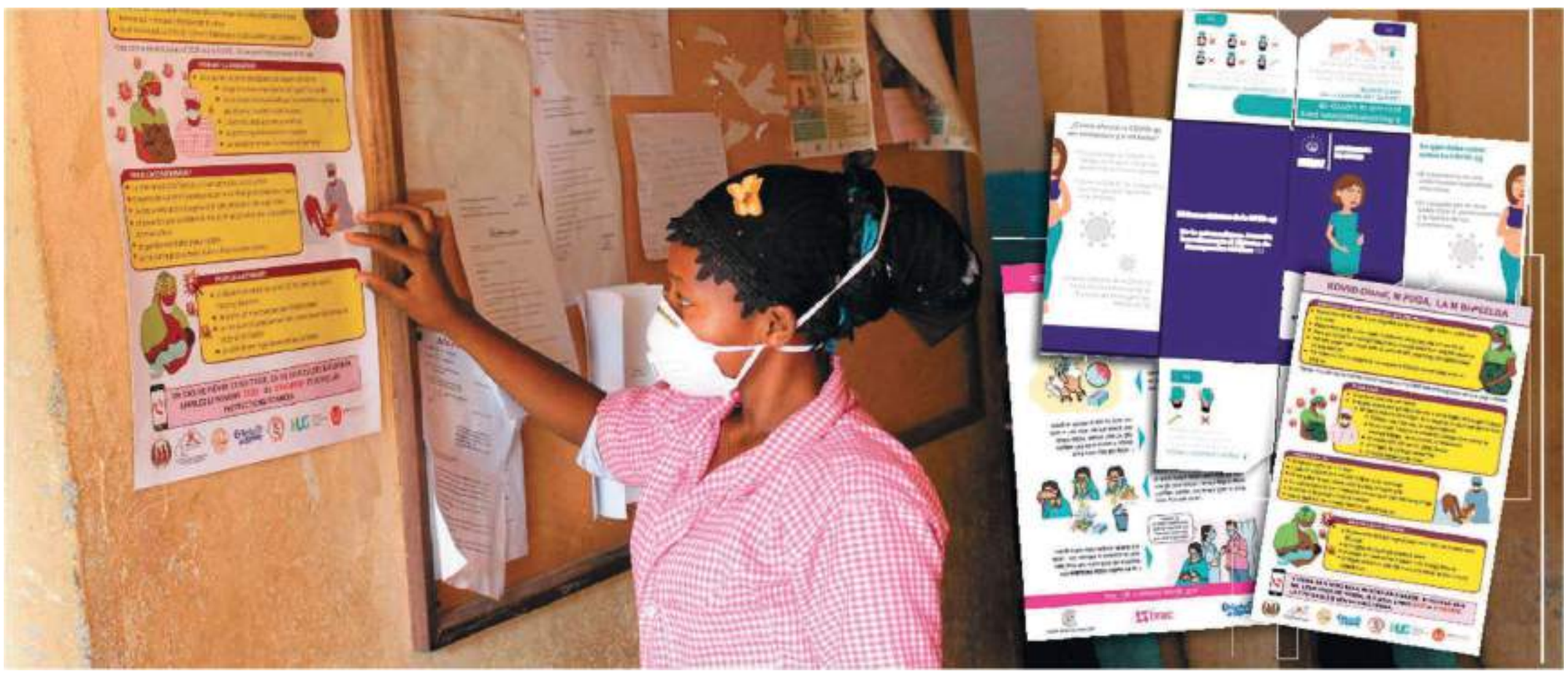
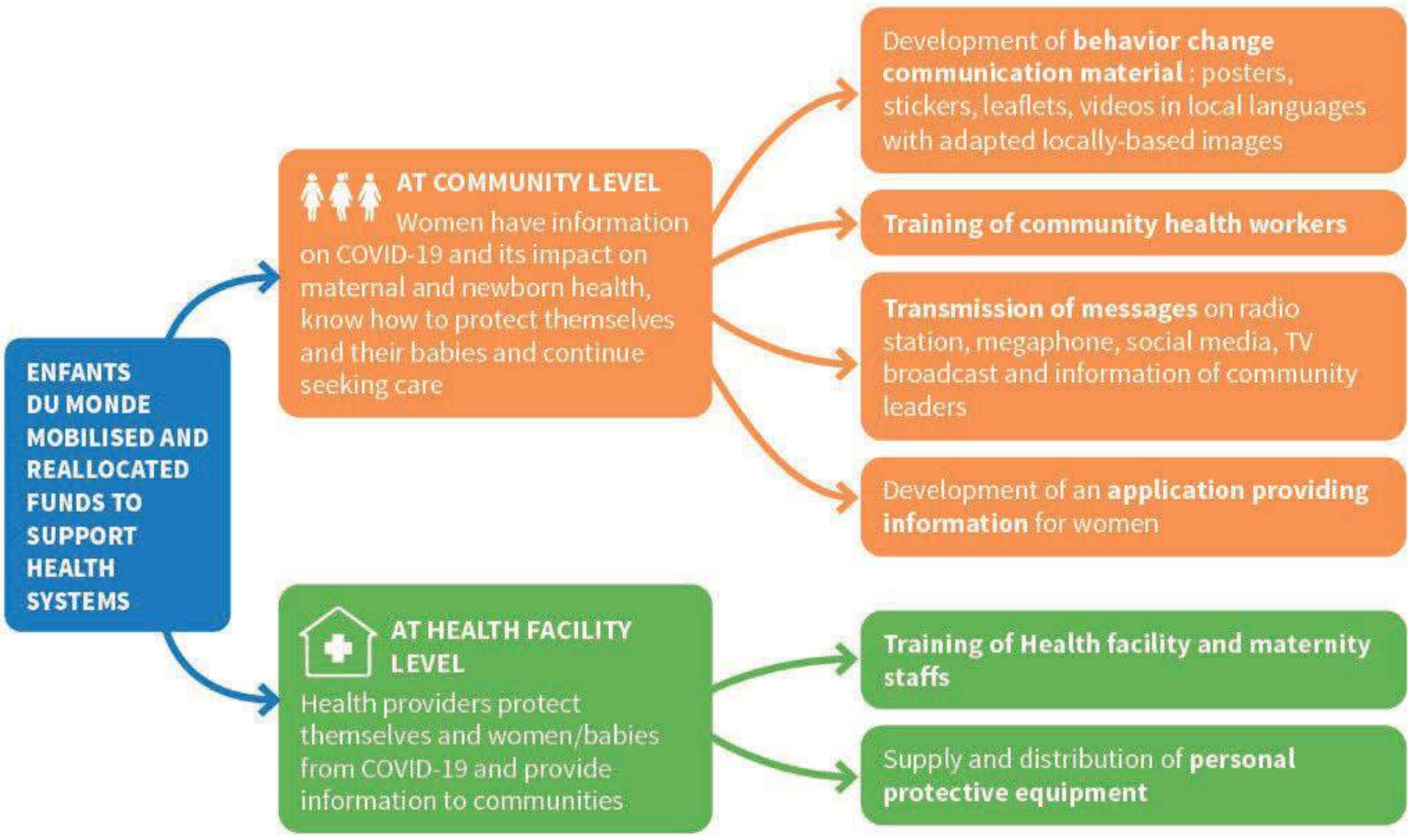


Context

- Bangladesh, Burkina Faso, El Salvador, Haiti and Madagascar, Enfants du Monde supports Ministries of Health to improve maternal and newborn health.
- During the pandemic, Enfants du Monde adapted its programs to support health systems to implement their COVID-19 Strategic Preparedness and Response Plan and to ensure maternal and newborn health continued to be high on the agenda.

Intervention



Results

972,132 women, newborns and health facility staff supported

Conclusion

- Our support was possible thanks to trust relationships with local partners and Ministries of Health, as well as the capacity of EdM for the rapid mobilization of technical staff within its own network.

Schistosome Cercarial Emission as a Tool to Face Rising Challenges: Parasite Hybridizations, Reservoir Hosts and Climate Change for Disease Control Using the One Health Paradigm

Hélène Moné and Gabriel Mouahid
Domitia, CNRS, IFREMER, Univ Montpellier, Perpignan, France

Schistosomiasis is a human-neglected tropical parasitic disease that affects impoverished communities and causes devastating health, social, and economic consequences to more than one billion people. It is due to a flatworm, the schistosome, which lives in the venous vessels of vertebrates. Human schistosomes belong to the genus Schistosoma, which has more than 20 species infecting domestic and wild animals. The life cycle includes two obligatory hosts: a homeothermic vertebrate where male and female worms reproduce and a freshwater snail where clonal multiplication occurs. Transmission between the two hosts is due to free-swimming larvae, miracidia for the vertebrate-snail transmission, and cercariae for the snail-vertebrate one. Such an introduction is commonly used in papers dealing with this disease. However, schistosomiasis control is challenged by three major rising phenomena, which will imply a substantial changing approach, that of One Health. We conducted field and experimental research on the cercarial emergence trait in high and low-endemic areas. The cercarial emission from the infected-snail host occurs each day (24 hours) during a specific period coinciding with the aquatic activity of the target vertebrate host in order to maximize transmission to the host. The cercarial emergence patterns associated with the molecular biology approach showed that natural hybridization between Schistosoma species is much higher than expected in both endemic areas and areas where the disease emerges. Zoonotic and human schistosome hybrids play a major role in schistosome transmission, placing schistosomiasis in the zoonotic diseases, even the species that, until now, were considered specific to humans. Climate change enhances the geographical range of the hybrid species from tropical areas to northern temperate areas (Europe). Hybridization between schistosomes gave rise to hybrid forms capable of simultaneously having several chronobiological profiles, allowing them to infect several hosts whose behavior with respect to water is different. We can no longer consider each species of schistosome as a separate entity. Hybrid forms lead us to treat schistosomiasis as a zoonotic parasitic disease involving humans, animals, and changes in the environment, the framework of the One Health approach.

Schistosome Cercarial Emission as a Tool to Face Rising Challenges: Parasite Hybridizations, Reservoir Hosts and Climate Change for Disease Control Using the One Health Paradigm

Authors

Hélène Moné and Gabriel Mouahid

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Introduction

Schistosomiasis is a human neglected tropical parasitic disease affecting more than one billion people. It is caused by a flatworm, the schistosome, which lives in the venous vessels of vertebrates. Transmission to the vertebrate host is due to free-swimming larvae, the cercariae, which emerge from the snail host each day during a specific period coinciding with the aquatic activity of the target vertebrate host.

Methodology

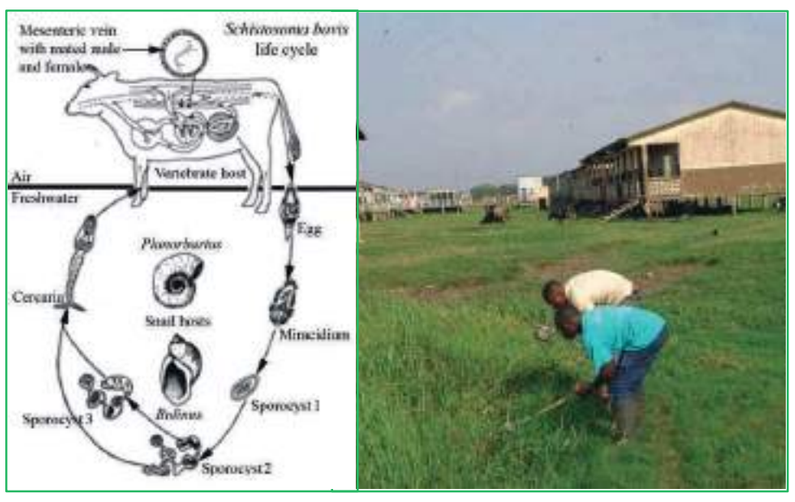
The cercarial emergence pattern was used as a tool to identify hybridization and the implications of reservoir hosts in the field.

Results

Hybridization between schistosomes gives rise to hybrid forms capable of having several simultaneous chronobiological profiles, allowing them to infect several hosts whose behaviors with respect to water are different. (a.) Schistosoma bovis early morning profile, adapted to cattle (yellow); (b.) schistosoma haematobium midday and afternoon profile, adapted to humans (blue); (c.), (d.) and (e.) hybrid combination profiles simultaneously adapted to bovines, humans and/or nocturnal rodents (purple).

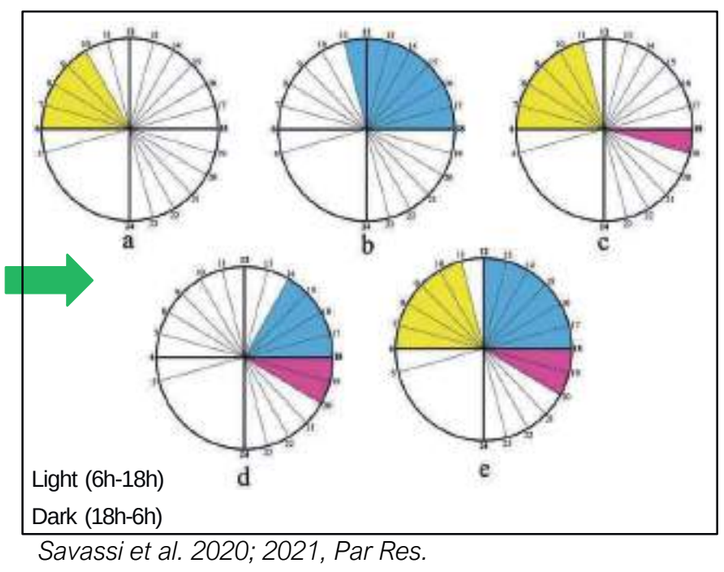
Conclusions

Schistosomiasis control is challenged by three major rising phenomena which will imply a huge changing approach, that of One Health. We can no longer consider each species of schistosome as a separate entity. Hybrid forms lead us to treat schistosomiasis as a zoonotic parasitic disease involving humans, animals and changes in the environment.

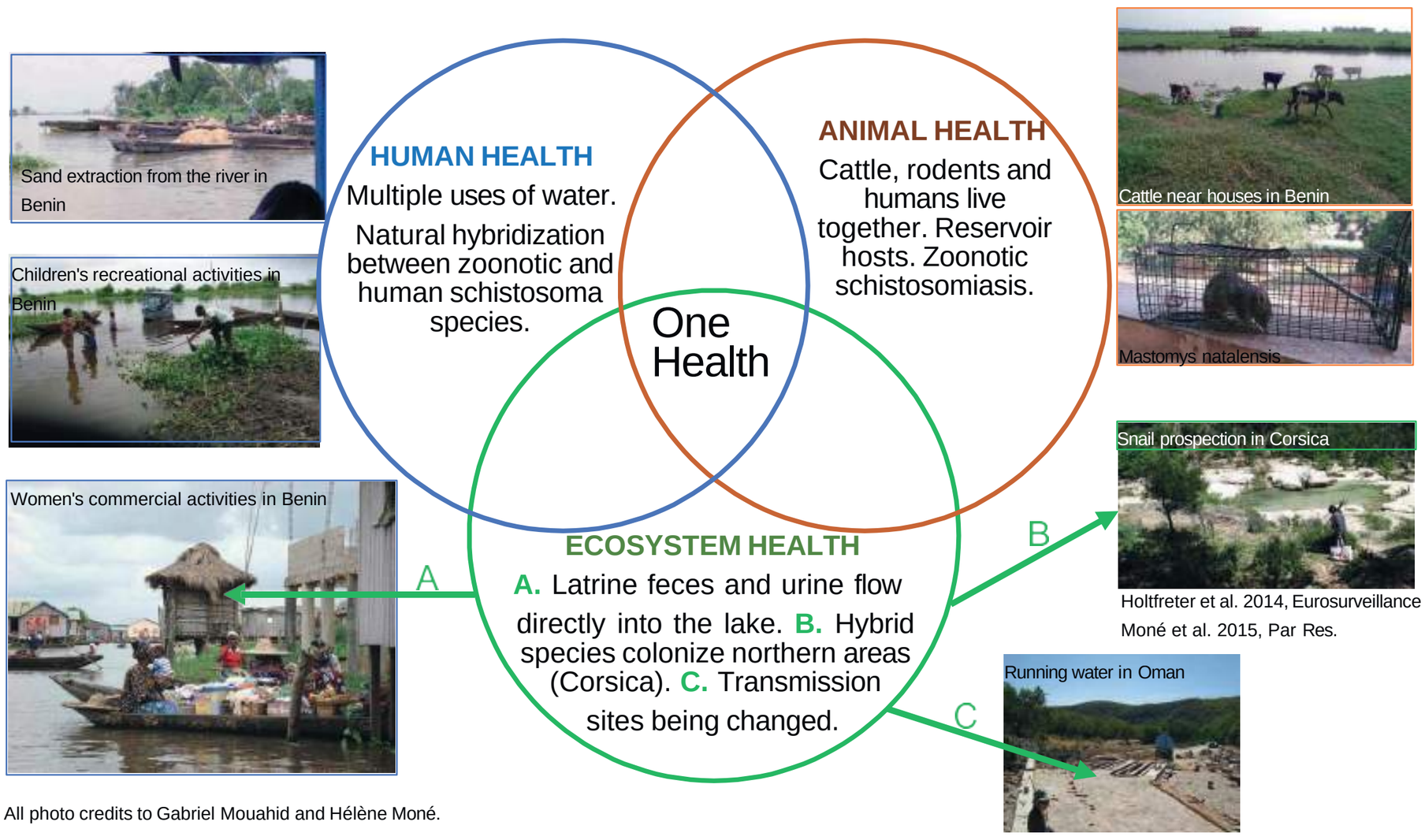


Freshwater snail collection in the field.

Filtration, staining and counting of cercariae.



Savassi et al. 2020; 2021, Par Res.



Holtfreter et al. 2014, Eurosurveillance

Moné et al. 2015, Par Res.

All photo credits to Gabriel Mouahid and Hélène Moné.

Schistosomiasis Training in Health Education Using the Inquiry-Based Learning Method as a Co-Construction Tool with the Communities for Implementing the One Health Paradigm

Gabriel Mouahid and Hélène Moné
IHPE, Univ Perpignan Via Domitia, CNRS, IFREMER, Univ Montpellier, Perpignan, France

Schistosomiasis is a chronic parasitic disease that affects humans with low social and economic status. It is widely present in Africa, Central America, Asia, the Middle East, and South Europe, causing health damage mainly to schoolchildren. It is due to a flatworm named Schistosome belonging to the genus Schistosoma and infecting domestic and wild animals. The life cycle includes two hosts: a homeothermic vertebrate where male and female worms reproduce sexually in the venous vessels, and a freshwater snail where an asexual multiplication occurs. Transmission between the two hosts is due to free-swimming larvae. Schistosomiasis control requires an integrated approach, including health education, which is part of the One Health paradigm. The training was conducted in South Benin with teachers in the sites where schoolchildren were largely infected. The training was based on the inquiry-based learning method. Trainees were faced with an educational situation for which they had to identify the main problem and express it with a question and implement an experimental protocol to answer the question. The trainees were confronted with different urine samples that showed different colors ranging from yellow to blood-red. All samples were collected from the schools where they teach. They were surprised by the high prevalence. Most of them identified the red color of the urine as the main scientific problem to study. They carried out the study and identified the parasite inside the eggs in the urine; they hatched the larvae of the parasite using freshwater and made observations under a microscope. The trainees were uncomfortable during the first day with the inquiry-based method and with the organization of the classroom, where they were no longer in front of the teacher but in front of themselves in several groups. The training program has been constructed in such a way that teachers can use it with their schoolchildren with minimal changes. The different parts of the parasite lifecycle have been studied, and the ecosystem factors that enhance the transmission of schistosomes and their role in the control of the disease have been discussed.

Schistosomiasis Training in Health Education Using the Inquiry-Based Learning Method as a Co-Construction Tool with Communities for Implementing the One Health Paradigm

Authors

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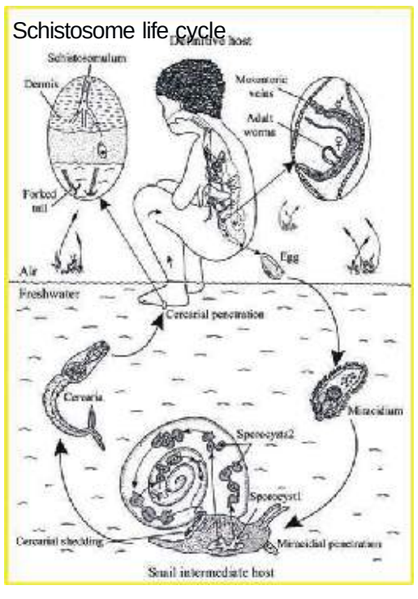
Introduction

Schistosomiasis is a chronic parasitic disease which affects humans with low social and economic status. It is widely present in Africa, Central America, Asia, the Middle East and the south of Europe, mainly causing health damage in schoolchildren. It is caused by a flatworm belonging to the genus Schistosoma infecting domestic and wild animals. The life cycle includes two hosts: a homeothermic vertebrate, where male and female worms reproduce sexually in the venous vessels, and a freshwater snail in which an asexual multiplication occurs. Transmission between the two hosts is due to free-swimming larvae. Schistosomiasis control requires an integrated approach, including health education, which is part of the One Health paradigm.

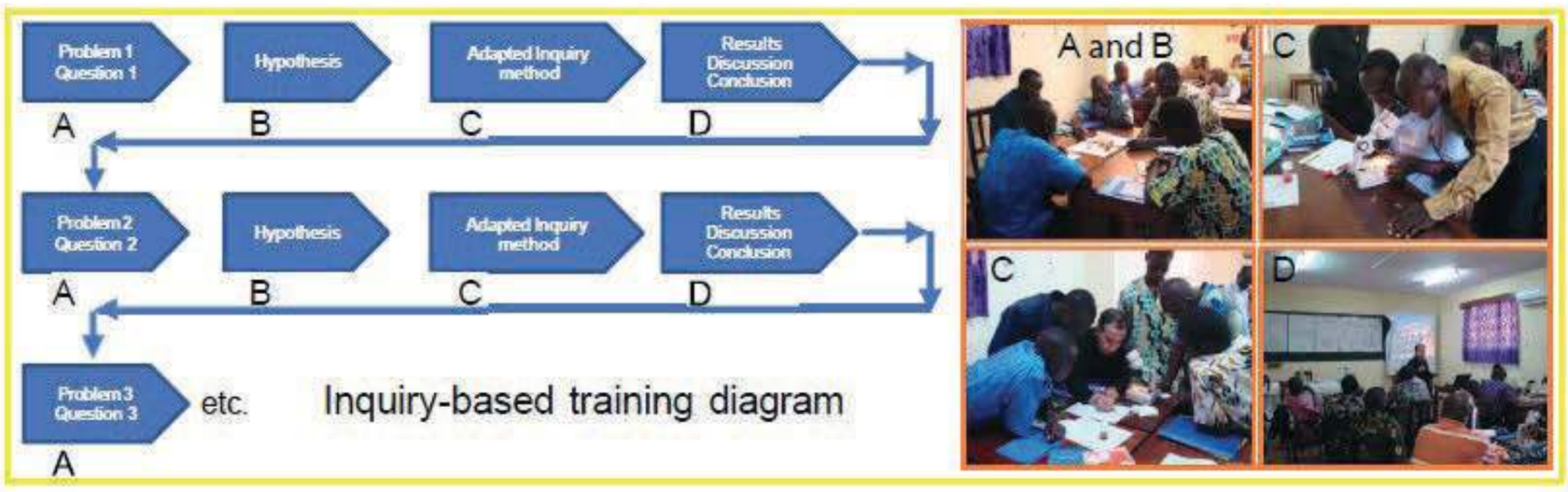


Materials for Training

Training was conducted in South Benin with schoolteachers and their supervisors at sites where schoolchildren were becoming infected. The biological material was collected at the school after an information phase with the schoolchildren. The urine samples were immediately transferred to the training classroom.

Training Steps

The trainees were put into groups of four or five. They communicated, shared their ideas and discussed within their group. Whenever necessary, synthesis times were used for intergroup sharing. Each group was given urine samples showing different colors (from yellow to red) and asked to: A. identify the main problem and express it with the question; B. state a testable hypothesis based on their knowledge; and C. build an inquiry method (experimentation) to test the hypothesis. Some groups proposed examining the urine using a microscope; D. The trainees identified abnormal particles within the urine; a precise examination showed that these particles were similar to eggs. A high magnification showed that the eggs contained moving larvae. This was one of the most important points of the training: the trainees realized for the first time that children were infected by a parasite that lays eggs inside the bladder that pass out with the urine. Then, a new question arose: what happens to these larvae once the urine has been passed? The trainees were invited, as above, to state a new hypothesis and implement a new inquiry method (see Figure below). This procedure was used for each scientific question throughout the training period until all the steps of the parasite life cycle had been constructed.



Conclusions

The training program was constructed in such a way that teachers can use it with their schoolchildren (8 to 12 years old) with minimal changes. The different parts of the parasitic life cycle were investigated and the ecosystem factors that enhance the transmission of schistosomes and their role in the control of the disease were discussed.

The Power of Community Participation for Improving the Health of Older Persons during COVID-19: The Case of Rwanda

Eli Mugabowishema
Nsindagiza, Kigali, Rwanda

In Rwanda, people aged 60+ are the least infected, but most die of COVID-19. NSINDAGIZA conducted a COVID-19 rapid needs assessment (RNA) for older persons to build evidence, designed the response and advocacy strategy, and documented and used evidence to engage the government and other stakeholders. Trained volunteers randomly chose 248 people (177F and 71M) in Nyarugenge and Ruhango, interviewed individuals and focus groups, and data were treated by the expert of Helpage Int.

- On the question about their top-three priorities: food (67%), livelihoods (29%), and shelter (19%);
- A total of 76% could not avoid touching their faces, and 46% could not keep social distance; while 71% were able to wash their hands, most older people did not have access to soap;
- Those 80+ are more likely to experience barriers in accessing information (21%) compared to those in their 50s (13%);
- The top three preferred ways of receiving information were: 51% via the radio, 24% via loudspeaker, and 14% via TV;
- A total of 13% of older people were using traditional un-tested plant-based remedies;
- A total of 62% had difficulty accessing food, 48% had faced greater difficulty accessing humanitarian assistance, especially those 80+, and 34% had greater difficulty accessing health services;
- While the lockdown has been reduced, the government has requested communities to provide support to those who were financially precarious;
- A total of 35% reported feeling anxious about their situation all or most of the time, and 30% were feeling depressed;
- Older people felt that they were only able to cope with the current situation with support from family, friends, and community.

Designing the response and advocacy approach: Worked with older persons to analyze and interpret the findings, make decisions on the response priorities, and agree on an approach to engage the government. Delivery of the response and engagement: Distribution of PPEs, non-food items (NFIs), assistive devices, engagement in policy dialogue with government, and outcomes of these engagements. Through the RNA, we reached the most marginalized facing the impact of the lockdown. We engaged the older persons' structure to plan and provide PPEs, NFIs, and assistive devices, and through the lobby with the government and other key decision-makers, a successful result was achieved for the older persons.

The Power of Community Participation in Improving the Health of Older Persons During COVID-19: The Case of Rwanda

Authors

Eli Mugabowishema

Nsindagiza, Kigali, Rwanda

Introduction

The first case of COVID-19 was reported in Rwanda on March 14, 2020. Older persons aged 70 years and above were the least infected but most likely to die of COVID-19.

Community Response to COVID-19

NSINDAGIZA conducted a COVID-19 rapid needs assessment (RNA) for older persons, to build evidence, designed the response and advocacy strategy, and documented and used evidence to engage government and other stakeholders.

RNA Methodology

Trained volunteers chose 246 people (177F and 71M) randomly in Nyarugenge and Ruhango, and interviewed individuals and focus groups. Data were examined by the expert from HelpAge International.

HelpAge International

Results

- On the question of their top three priorities: food (67%), livelihoods (29%) and shelter (19%).
- A total of 76% could not avoid touching their faces, 46% could not keep social distances, and while 71% were able to wash their hands, most older people did not have access to soap.
- Those over 80 were more likely to experience barriers in accessing information (21%) compared to those in their 50s (13%).
- The top three preferred ways of receiving information were via the radio (51%), via loudspeaker (24%) and via TV (14%).
- A total of 13% of older people were using traditional, un-tested plant-based remedies.
- A total of 62% had difficulty accessing food, 48% had faced greater difficulty in accessing humanitarian assistance, especially those over 80, and 34% had greater difficulty accessing health services.
- While lockdown has been reduced, the government has requested communities to provide support to those who are financially precarious.

Designing the response and advocacy approach

Working with older persons to analyse and interpret the findings, making decisions on the response priorities, agreeing on approach to engage the government.

Delivery of the response and engagement

The distribution of PPE, non-food items (NFIs), assistive devices, engagement in policy dialogue with government and the outcomes of these engagements.

Conclusion

Through the RNA, we reached the most marginalised facing the impact of the lockdown. We engaged the older person's structure to plan and provide PPE, NFIs and assistive devices, and through lobbying the government and other key decision-makers this was achieved for older people.

NSINDAGIZA Organization

age International

Ethical Challenges with Decision-Making in Elder Care in Ethiopia

Kirubel Manyazewal Mussie[1], Mirgissa Kaba[2], Jenny Setchell[3], and Bernice Simone Elger[1,4]
[1] Institute for Biomedical Ethics, University of Basel, Switzerland
[2] School of Public Health, Addis Ababa University, Ethiopia
[3] School of Health and Rehabilitation Sciences, The University of Queensland, Australia
[4] Centre for Legal Medicine, University of Geneva, Switzerland

Ethical decision-making is an important discussion in the area of elder care. This is a qualitative exploratory study based on interviews conducted between March and November 2021 with 20 older adults (aged 60 and above) and 26 health professionals in Ethiopia. The first ethical challenge was lack of informed consent as health professionals do not provide all the needed medical information and explanation to older patients due to reasons such as lack of time to explain because of high patient load, health professional lack of knowledge and ethical conduct, and thinking older patients might become frustrated and/or refuse treatment if they knew the truth about their health condition. The second ethical challenge was dealing with family involvement. Families and relatives of older patients often greatly influence the treatment plans of older patients and sometimes override decisions made by the older patients themselves or health professionals.
Thirdly, there were ethical challenges resulting from value conflicts between health professionals and older patients. Health professionals often experienced a dilemma between benefiting the patients and respecting their autonomous decisions informed by their cultural and religious beliefs. Furthermore, health professionals had ethical dilemmas with prioritizing older COVID patients in the face of resource scarcity. These findings add more knowledge on the ethical challenges and considerations in elder care in low- and middle-income countries. This study also implies that health professionals dealing with tensions between the health needs of older people, culture, and resource scarcity need more comprehensive geriatric education, ethics training, and ethical guidelines.

Ethical Challenges with Decision-Making in Elder Care in Ethiopia

Authors

Kirubel Manyazewal Mussie[1], Mirgissa Kaba[2], Jenny Setchell[3], and Bernice Simone Elger[1,4]

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[4] Centre for Legal Medicine, University of Geneva, Switzerland

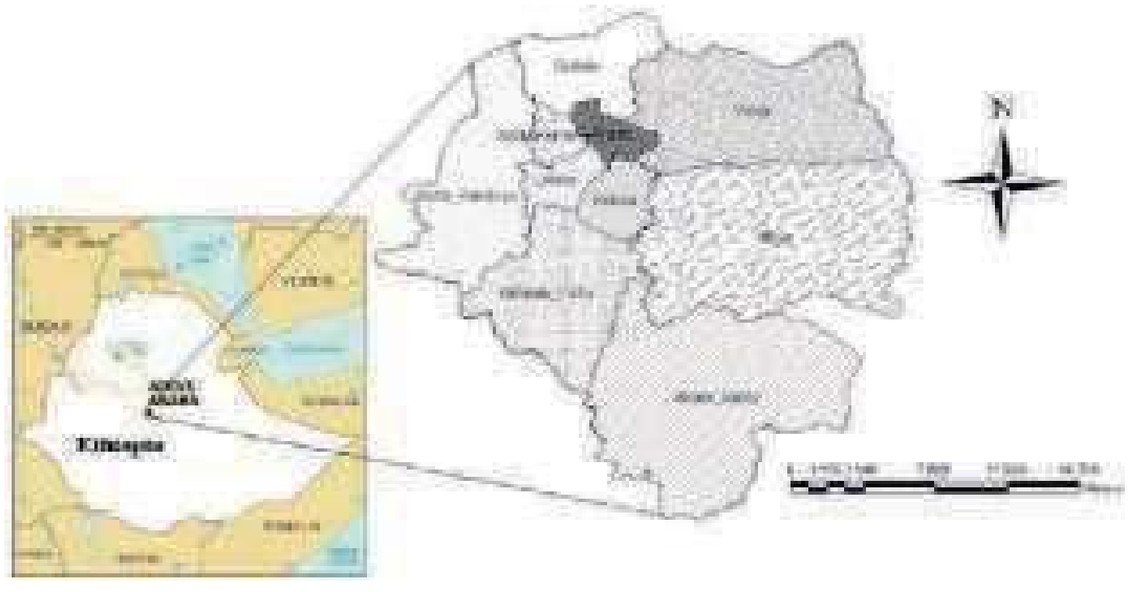
Background

- In Ethiopia, the number of older adults will reach 8.3 mil by 2030.

- Transitions are being made from traditional to modern healthcare!

- Limited research combines (bio)ethics and ageing in Ethiopia and Africa broadly (we carried out a scoping review to check this).

- The aim was to explore ethical challenges with decision-making in elder care in Addis Ababa, Ethiopia.



Methods

- Qualitative interviews with 20 older adults and 26 health professionals conducted between Mar and Nov 2021.

- Inductive, thematic analysis–Braun and Clark's framework.

Results

1. Lack of informed consent

"They don't give us time, they don't even listen. What is the use if you don't explain things very well?" O.Ad.

2. Family over-involvement

"The family decides at the end" H.Pro. "Usually, you treat the family more than the older patient" H.Pro.

3. Value conflict between H.Pro and O.Ad

"They don't listen sometimes. For ex, they skip medication when they are fasting and say no when you tell them not to." H.Pro. "I just pray to God. There is nothing that helps" O.Ad.

4. Priority setting during COVID-19

"Our machines cannot be for all, so we sometimes use age to give priority. I will definitely lean towards saving the younger patient. The older has lived until now, at least." H.Pro.

Implications

- Decision-making is becoming more complicated in an ageing world.

- Global health efforts need to facilitate more geriatric and ethical policies, education and experience sharing in an increasingly globalising world.

Acknowledgements

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The Importance of Preventing Deforestation to Limit Future Emerging Infectious Disease Outbreaks

Shaila Nagpal
LSE, London, Canada

Rates of deforestation are escalating, reaching unprecedented levels, resulting in massive disruption and loss of biodiversity, and increasing the ability for species carrying viruses to spread pathogens that cause infectious outbreaks. This type of disturbance to land results in the migration of animals and insects to new areas, where they can carry disease vectors that spread quickly to humans. The main objective of this presentation is to emphasize the importance of preventing deforestation and the crucial need for it to be a higher priority for governments to protect the health of the population. This study conducted a literature review by using various databases such as Web of Science, PubMed, and Google Scholar, providing access to a multitude of scholarly articles focused on deforestation and the connection to new and old pathogens emerging. This study examined a case study on the Brazilian Amazon, including various studies conducted determining that dominant vectors of malaria, such as An.darlingi and Ny.darlingi, flourish in shallow pools of water that are left from deforested regions and eroded land (Walsh et al., 1993). Additionally, through this case study, this paper examined how the Brazilian government was able to cut down on deforestation rates by enforcing greater monitoring and law enforcement in highly deforested areas. Furthermore, investments made by the United National Programme on Reducing Emissions from Deforestation and Forest Degradation (REDD+) program focused on diminishing climate change. Norway invested in the REDD+ program to provide compensation to Brazil if they met certain targets of reducing emissions and eradicating deforestation, greatly contributing to the reduction in deforestation. This study emphasizes the importance of using the REDD+ program to target developing tropical countries that do not hold as high of a capacity to reduce deforestation on their own. Pandemics and outbreaks can amount to thousands or millions of human lives lost, massive economic costs, and years to develop efficient and safe vaccines, as exhibited through the COVID-19 pandemic (Priyadarsini et al., 2020). Investing in reducing deforestation is crucial in the upcoming years to ensure the safety of the population's health and economic costs that arise from outbreaks.

The Importance of Preventing Deforestation to Limit Future Emerging Infectious Disease Outbreaks

Authors

Shaila Nagpal

LSE, London, Canada

Introduction

Rates of deforestation are reaching unprecedented levels, resulting in disruption and a loss of biodiversity. It is estimated that half of the emerging diseases that occurred after 1940 can be traced to disrupted biodiversity [1]. Diseases are more easily contractable in areas that have disturbed land, fragmented habitats, and wildlife markets. Deforestation is occurring in nine primary areas: the Brazilian Amazon and Cerrado, the Bolivian Amazon, Paraguay, Madagascar, Sumatra, and Borneo in Indonesia and Malaysia.

In this study, I examined a specific case study in the Brazilian Amazon, linking deforestation to increasing rates of malaria transmission.

Methodology

Conducted a literature review following trends in deforestation and the correlation with increasing emerging infectious diseases and the transmission of diseases and pathogens.

Focused on a specific case study in the Brazilian Amazon linking deforestation to increasing rates of malaria.

Results: Brazilian Case Study

- The study was conducted in Mâncio Lima County, examining the biting rates of mosquitoes and the prevalence of malaria cases in various health districts with differing deforestation rates.
- The results found that the mean biting rate of the malaria vector *An.darlingi* was 8.33 in areas with more than 80% deforestation, in comparison to a much lower biting rate of 0.03 per site with less than 30% of forests cleared [2].
- *An.darlingi* larvae has doubled in breeding sites with less than 20% of forest, in contrast to areas with 20 to 60% of forests intact [2].
- The malaria vectors *An.darlingi* and *Ny.darlingi* thrive in a combination of shade and sunlight, clear water vegetation, and neutral to high pH levels (16 to 18), conditions mostly found at forest edges rather than within intact forests [3].

Discussion and Policy Implications

- Tropical forests continue to be undervalued, as they protect the population from climate change and contain emerging diseases, which can harm thousands to millions of people [4].
- Norway invested in the REDD+ program, offering to provide compensation to Brazil if they met certain targets of reducing emissions and policies to eradicate deforestation.
- Brazil and Norway constructed a climate change agreement in 2008 to reduce deforestation, and in 2009 Brazil began to receive funds from Norway to assist with enforcing policies aimed at reducing deforestation.
- The REDD+ program should be used in developing tropical countries which do not have the capacity to reduce deforestation and require compensation [5].

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Analyzing the Spatial Contours of Child Health in India: Evidence from NFHS4 to NFHS5

Apoorva Nambiar[1], Thirumal Reddy[2], Ashish Singh[2], Dharmalingam Arunachalam[3], and Satish B. Agnihotri[2]

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[3] Monash University, Australia

Malnutrition has always been and continues to be one of the critical development issues globally. India has been identified as one of the countries among the LMICs where the prevalence of malnutrition is alarmingly high. Eliminating malnutrition is one of the key goals set by the 2015 UN Sustainable Development Goals. Even though recent evidence shows a nominal reduction in the rates in India, the goals are far from being reached. The geographic information system (GIS) tools help provide better answers to research questions surrounding these areas. The current study explores various GIS techniques to identify pockets of the low and high burden of malnutrition to plan calibrated steps for its elimination, whether through convergence or standalone interventions. For the first time, the most recent 2019–2020 district-level data (National Family Health Survey, wave 5) have been utilized to study the spatial contours and heterogeneity of malnourished children. Various spatial econometrics models were applied to study the spatial pattern and clustering of malnutrition and its risk factors. Geospatial techniques like Moran's I statistics and Univariate and Bivariate LISA were applied to understand the spatial dependence across the districts. Spatial regression models, namely spatial lag and error models and geographically weighted regression, were used to examine the correlates of malnutrition at the micro-level. More than 20% of the districts showed high-high spatial association of children underweight, also showing the strongest geographical clustering with a Moran's I value of 0.68 ($p<0.001$), followed by children stunted (0.52, $p<0.001$) and children wasted (0.47, $p<0.001$). The regression results confirmed that the immediate and underlying determinants of malnutrition, namely, feeding practices, mother's education, age at marriage and pregnancy, and sanitation facilities, were the critical and statistically significant determinants of child nutrition. These results from the analysis facilitate the identification of hotspots of low and high prevalence, and hence it can be used to allocate resources effectively to reduce health inequities between and within districts. The evidence gathered from this study can be used by decision-makers for developing better strategies at the micro-level and long-term planning to find solutions to mitigate the problem of undernutrition.

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Background

- India has been identified as one of the countries among the LMIC where the prevalence of malnutrition is alarmingly high.
- Eliminating malnutrition is one of the key goals in the 2015 UN Sustainable Development Goals.
- Even though recent evidence shows a nominal reduction in the rates in India, the goals are far from being reached.
- Geographic information system tools help provide better answers to research questions surrounding these areas. The current study explores various GIS techniques to identify pockets of low and high burden of malnutrition to plan calibrated steps for its elimination–whether through convergence or standalone interventions.

Objectives

- To explore the spatial heterogeneity of child undernutrition at the micro level across the districts of India;
- To examine the spatial patterns, spatial clustering and risk factors of undernutrition among children aged below 5 years across the districts.

(1) Univariate Local Moran's I

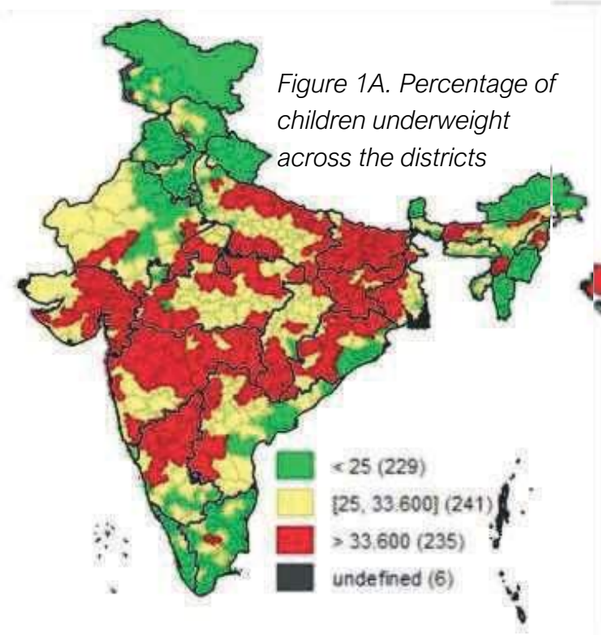


Figure 1A. Percentage of children underweight across the districts

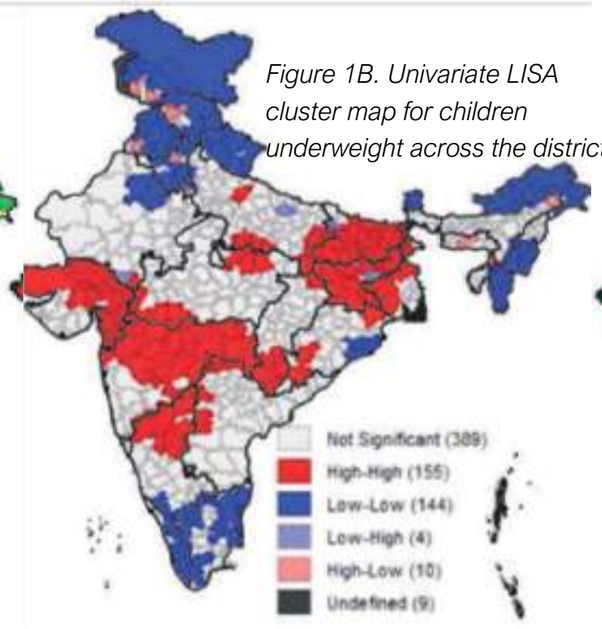


Figure 1B. Univariate LISA cluster map for children underweight across the districts

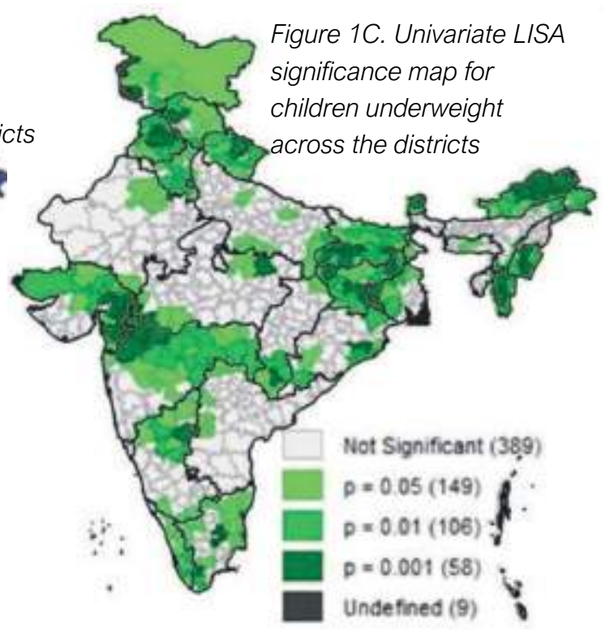
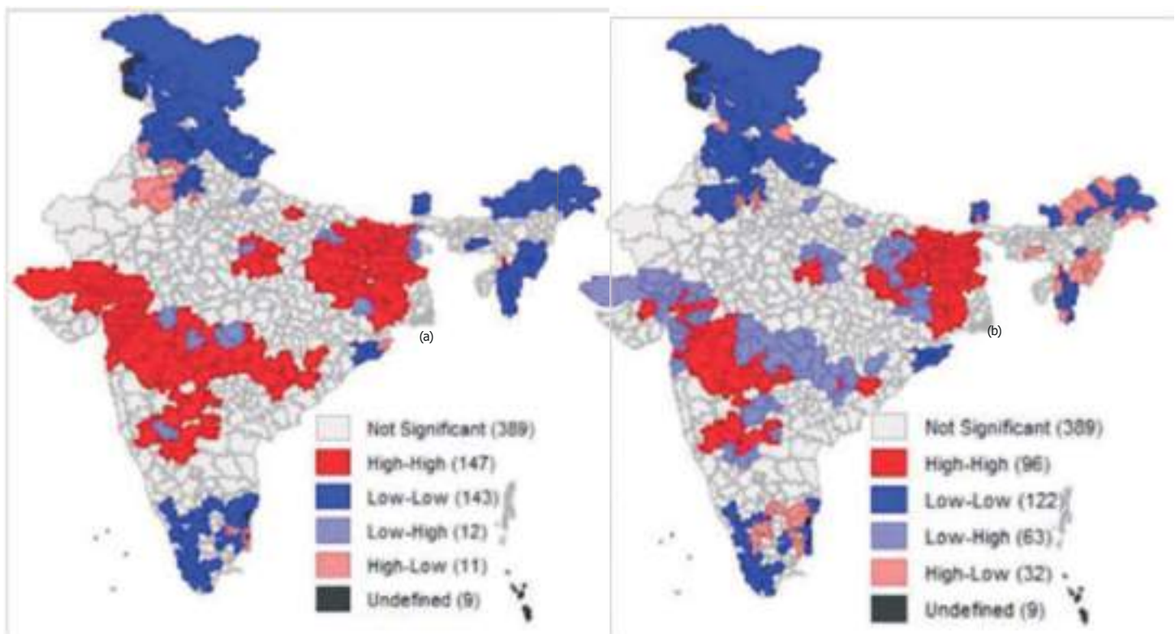


Figure 1C. Univariate LISA significance map for children underweight across the districts

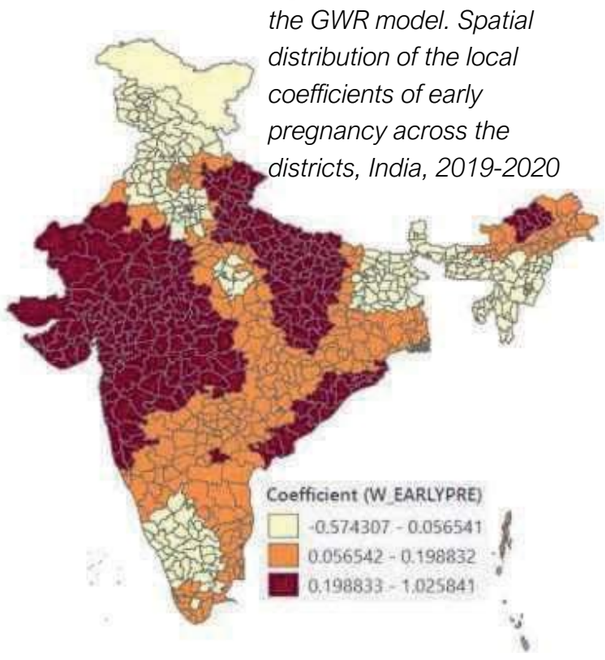
(2) Bi-variate Local Moran's I: children undernourished with correlates

Figure 2. Bivariate LISA cluster of (a) mother's BMI status vs children underweight and (b) early pregnancy vs children underweight.



(3) GWR Model Results

Figure 3. Estimated results of the GWR model. Spatial distribution of the local coefficients of early pregnancy across the districts, India, 2019-2020



(4) LISA Moran's I statistics

Table 1. Bivariate LISA Moran's I Statistics showing the spatial dependence for the district level prevalence of child malnutrition against its correlates.

District- level variables	Underweight	
	Bivariate LISA	p value
Percent Households using improved drinking water	-0.005	0.42
Percent Women whose Body Mass Index (BMI) is below normal (BMI < 18.5 kg/m2	0.63	0.001
Percent Women having early pregnancies	0.24	0.001
Percent Children who received postnatal care within two days of delivery	-0.015	0.20

(5) Spatial Regression: children underweight and correlates

Table 2. Results. Spatial regression models to assess the association of child underweight and its correlates across districts, 2019-2020.

District-level correlates	OLS	Spatial Lag Model	Spatial Error Model
Percent Households using improved drinking water	-0.01	-0.01	-0.03
Percent Women whose Body Mass Index (BMI) is below normal (BMI < 18.5 kg/m2	0.94***	0.52***	0.67***
Percent Women having early pregnancies	0.16***	0.07*	0.11*
Percent Children who received postnatal care within two days of delivery	-0.04***	-0.02**	-0.03
R- squared value	0.57	0.70	0.68
Lambda Value (Lag Coefficient)			0.63
Rho Value (Lag coefficient)		0.53	
Log likelihood	-2306	-2201	-2224
AIC value	4622	4415	4459
No. of regions	705	705	705

Findings

- More than 20% of the districts showed a high-high spatial association of children underweight, and also showed the strongest geographical clustering, with a Moran's I value of 0.68 ($p<0.001$), followed by children stunted (0.52, $p<0.001$) and children wasting (0.47, $p<0.001$).
- Pockets of low and high levels of malnutrition were identified, which can be used to plan calibrated steps for its elimination and to develop a customized action plan for rapid reductions in malnutrition.
- The regression results confirmed that the immediate and underlying determinants of malnutrition, namely mother's age at first pregnancy, mother's nutritional status and children receiving postnatal care within two days of delivery, were the critical and statistically significant determinants of child nutrition.
- The GWR results suggested that the magnitude of association of children underweight with its correlates varied spatially because of the strong location-specific behavior across space.

Data and Methods

- The 2019–20 district-level data from the National Family Health Survey, wave 5, were utilised to study the spatial contours and heterogeneity of undernourished children.
- Outome variables: children under five years old with stunting, wasting or underweight. Predictor variables: based on principal component analysis, four variables were chosen: children who received postnatal care within two days of delivery, women whose Body Mass Index was below normal, women with early pregnancies and households using improved drinking water.
- Various spatial econometrics models were applied to study the spatial pattern and clustering of undernutrition and its risk factors.
- Geospatial techniques like Moran's I statistics and Univariate and Bivariate LISA were applied to understand the spatial dependence across the districts. Spatial regression models, namely spatial lag and error models, and geographically weighted regression, were used to examine the correlates of malnutrition at the micro level.

Conclusions

- These results from the analysis facilitate the identification of hotspots of low and high prevalence, and hence they can be used to allocate resources effectively to reduce health inequities between and within districts.
- Health resource allocations and child-health-specific interventions need to be implemented in the geographical hotspots of higher undernutrition prevalence.
- The evidence gathered from this study can be used by decision-makers for developing better strategies at the micro-level and in long-term planning to find solutions to mitigate the problem of undernutrition.

Seasonal Variations of Childbirth in India: A Policy and Program Planning Perspective

Apoorva Nambiar[1], Dripta Roy Choudhury[2], and Satish B. Agnihotri[3]
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For the human population, there is no biological interregnum across the seasons in terms of birth. Nevertheless, births do show seasonal patterns, and in India, given the different climatic zones along with varied agro-economical patterns and socio-cultural diversities, it is crucial to study its patterns and their probable causes. Analyses done so far have been based on small samples and limited geographical locations. The present study examines, for the first time, the seasonality of childbirth across all states of India using the Health Management Information System (HMIS) data on all reported live births over a 36-month period. We used the HMIS monthly data for three years, 2017–2018, 2018–2019, and 2019–2020. 'Total children born' was the primary outcome variable of this study, examined as a percent of total annual births and absolute counts. Rural–urban variations were also analyzed for each state of India. Time-series analyses were conducted to analyze seasonality. The extent of birth variations has been studied by actual numbers and by calculating and mapping standard deviations for each state. If there were no seasonal birth variations, births every month would have accounted for 8.33% of total annual births. However, this study indicated the existence of distinct seasonal variation across states, and the extent of variation around the mean was found to be close to 10% in India. The state-wise variability ranged between 4% and 18%. Consistent birth peaks in the August–October window and dips in the February–March window, as well as some equally interesting departures from these dominant trends, have emerged at the regional level. Such seasonality could be attributed to the agricultural patterns, climatic conditions, the farming cycle, and coinciding with less abundance of food and money, or simply because of administrative reporting formalities than an actual increase in birth. These findings are of interest to both academic research and the policy domain. Identification of peak and lean months will help health service functionaries to prioritize the delivery of maternal and child services and family planning facilities, leading to more targeted and focused preventive steps for better maternal and child health outcomes.

Seasonal Variations of Childbirth in India: A Policy and Program Planning Perspective

Authors

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Background

There is no biological interregnum across the seasons in terms of birth. Yet, births do show seasonal patterns, and in India, given the different climatic zones along with varied agro-economical patterns and socio cultural diversities. It's crucial to study its patterns and their probable causes. Till now, not much research has been conducted.

Objective

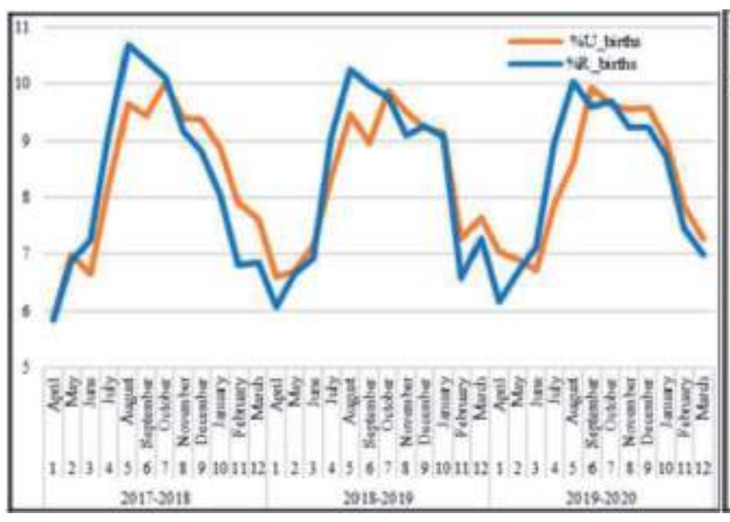
The present study examined the seasonality of childbirth and corresponding conception throughout the states of India based on the agro-climatic variation present in the country.

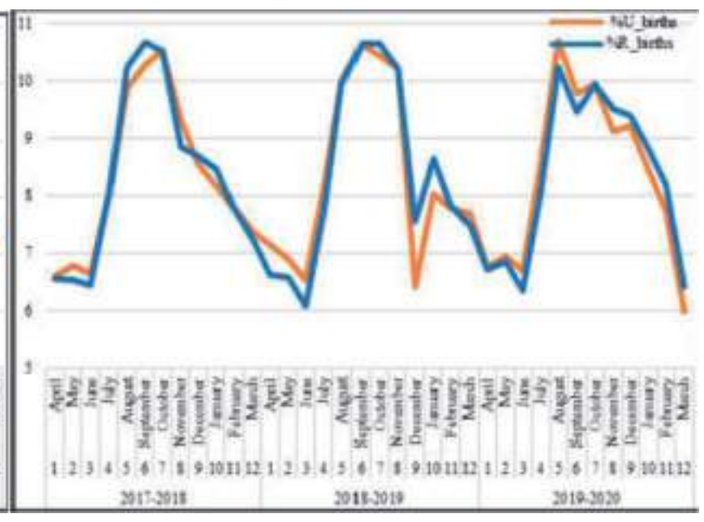
Data and Methods

- Monthly data from the Health Management Information System for three years was utilized (2017-2018 / 2018-2019 / 2019-2020).
- Total children born was the primary outcome variable, examined as percent of total annual births and absolute counts.
- Rural-urban variations were also analysed for each state of India.
- Time-series analyses were conducted to analyse seasonality.
- The extent of birth variations has been studied by actual numbers and by calculating and mapping standard deviations for each state

Results

Percentage of births per month by total annual births, state-wise, HMIS 2017-2020





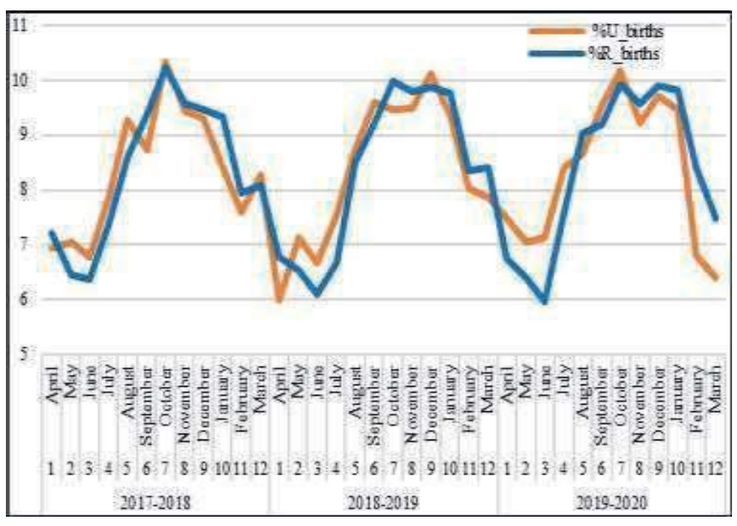
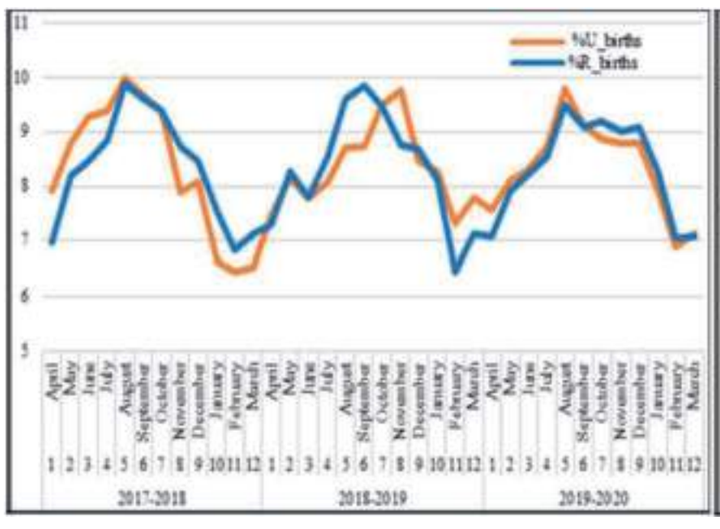
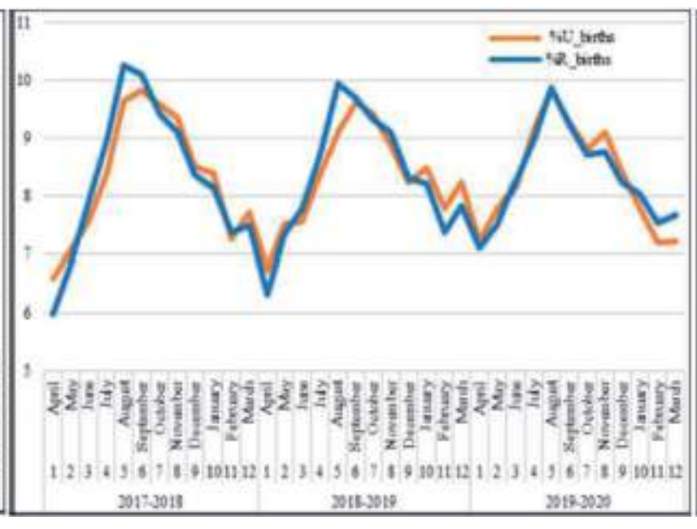


Figure 1. Birth seasonality in Haryana, a northern state of India. Figure 2. Birth seasonality in Bihar, an eastern state of India. Figure 3. Birth seasonality in Assam, a north-eastern state of India.





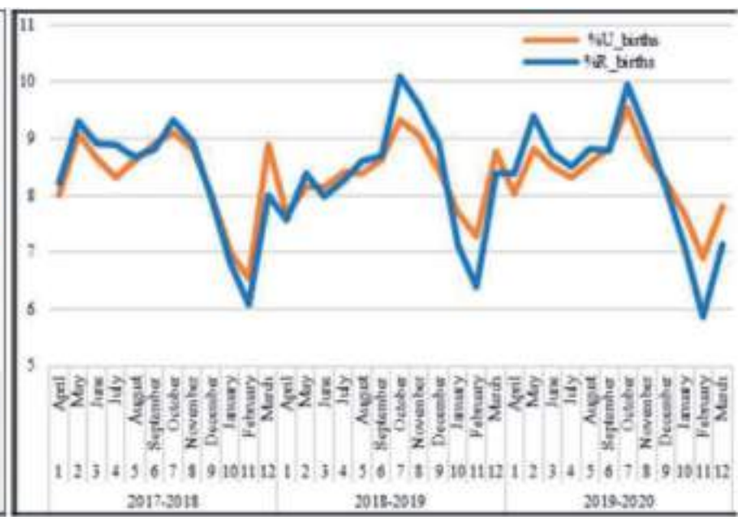


Figure 4. Birth seasonality in Gujarat, a western state of India. Figure 5. Birth seasonality in Gujarat, a western state of India. Figure 6. Birth seasonality in Tamil Nadu, a southern state of India.

State-wise standard deviation results, HMIS 2017–18 to 2019–20

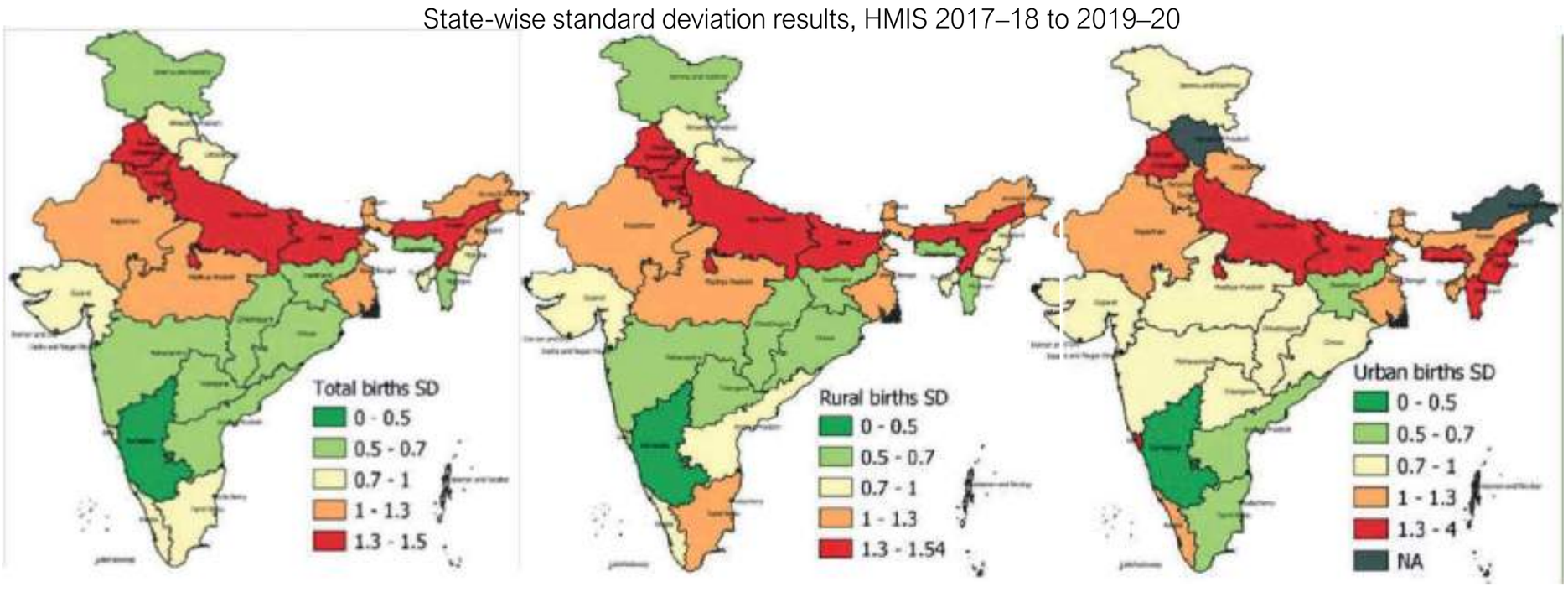


Figure 7. Standard deviation maps of seasonal variation in births.

Findings

If there was no seasonal variation, births every month would account for 8.33% of the total annual births. But this study indicated the existence of distinct seasonal variation across states, and the extent of variation around the mean was found to be close to 10% in India.

- The state-wise variability ranged between 4% and 18%.
- Consistent birth peaks in the August–October window and dips in the February–March window, as well as some equally interesting departures from these dominant trends, have emerged at the regional level.
- Such seasonality could be attributed to agricultural patterns, climatic conditions, the farming cycle and coincidence with lower abundancy of food and money, or just simply because of administrative reporting formalities rather than an actual increase in birth.

Conclusion

The study has considerable implications for policy as well as programme implementation.

- One immediate aspect is to draw attention to meeting unmet contraceptive needs in order to protect against unwanted conception during the peak conception months.
- Another important aspect is to ensure the availability of the stock of required vaccines, e.g., TT doses, and medicine such as albendazole, IFA and calcium tablets during pregnancy.
- The study will also facilitate ensuring services like primary immunisation for children, e.g., BCG to measles.
- These findings are of interest to both academic research and the policy domain. In particular, the identification of peak and lean months will help health service functionaries to prioritise the delivery of maternal and child services and family planning facilities. This will lead to targeted and focused preventive steps to improve children's health.

New Approaches to Studying the Natural Cycle of the Ebola Virus in Wildlife

Ndong Mebaley Telstar Ghestin[1, 2], Becquart Pierre[1], Maganga Gaël Darren[1, 2], and Leroy Eric[1]
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In recent years, Ebola virus (EBOV) epidemics have continued to multiply across the African continent, claiming a growing number of victims. The natural cycle of the Ebola virus and the mechanisms that lead to human contamination are still largely unknown. Among the many studies carried out since the first epidemic in 1976, only antibodies and nucleotide sequences have been detected in several species of fruit bats and insectivores in Africa between 2002 and 2019. Given the many grey areas surrounding the circulation of EBOV in its environment, the main aim of this subject is to study the natural cycle of the Ebola virus in wildlife using new technological approaches and to show the involvement of domestic animals in human infection in Gabon. The aim of my presentation will be to review the state-of-the-art on the epidemic situation of the Ebola virus in Africa and to present new technological approaches to genome detection and serological markers. To meet these objectives, the work is based on a multidisciplinary approach. Indeed, EBOV represents a particularly interesting model of infectious agents from wildlife, whose study can provide innovative and relevant information on the diversity of mechanisms involved in the circulation of infectious agents in wildlife and their passage to the human species. With this in mind, the use of modern, highly sensitive virus detection techniques based on non-invasive biological samples (bat urine and guano collected at the foot of fruit trees and saliva left on fruit; blood and organs collected from bush meat; blood from domestic animals (dogs and small ruminants)) could prove fruitful. We propose to search for RNA using digital PCR (dPCR), which has the advantages of greater detection accuracy in a complex mixture of samples, increased sensitivity, and tolerance to inhibitors; Ebola virus-specific antibodies by Luminex, with the advantages of multiplexing and low biological sample consumption.

Nouvelle Approche dans l'étude su Cycle Naturel du Virus Ebola dans la Faune Sauve

Authors

Ndong Mebaley Telstar Ghestin[1,2], Becquart Pierre[1], Maganga Gaël Darren[1,2], and Leroy Eric[1]

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Contexte

Une connaissance approfondie des écosystèmes

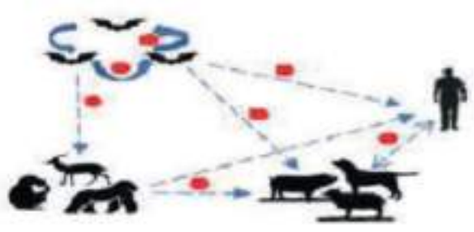
En particulier de la faune sauvage

permet de mieux comprendre les zoonoses

Et de lutter efficacement contre leur propagation

Découverte en 1976 au Zaïre (RDC) la maladie à virus Ebola est responsable de près de 35000 pour 15000 décès environ.

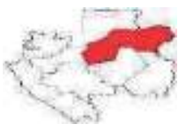
Elle touche aussi bien les hommes que les primates non humains avec un taux de létalité à voisinant les 90%.



- Après près d'un demi-siècle de recherche, pas de connaissance véritable sur le cycle naturel du virus Ebola,
- La chauve-souris reste seul potentiel réservoir,
- Le rôle des animaux sauvages reste mal ou peu connu,
- Le rôle des animaux domestiques demeurent énigmatique.

Ces travaux ont pour objectif principal d'étudier le cycle naturel du virus Ebola dans la faune sauvage en utilisant des nouvelles approches et montrer l'implication des animaux domestiques dans l'infection chez l'Homme au Gabon.

Méthodes



Ville de Mékambo
Mékambo - Mazingo
Mékouma - Malouma
Mékambo - Ekata

Fèces de grands singes

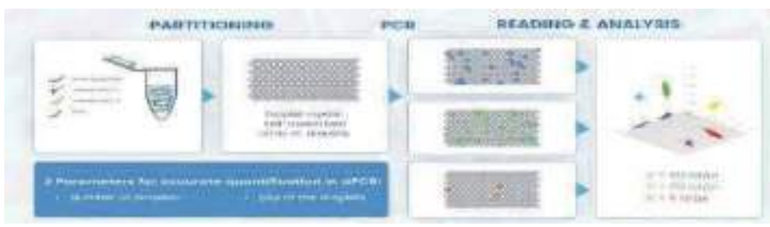
Guano de chauves-souris

Fruits consommés par des chauves-souris

Organes d'animaux sauvages

Sang d'animaux domestiques

Technique sérologique: Luminex



Technique de biologie moléculaire: Digitale PCR

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One Health Community-Based Wildlife Mortality Surveillance for Ebola: Linking the Public Health and Conservation Sectors

Alain U. Ondzie[1], Eeva Kuisma[1], Sarah H. Olson[2], K.N. Cameron[2], P.E. Reed[2], Chris Walzer[2], W.B. Karesh[3], M. Jeremiah Matson[4], Trent Bushmaker[4], Stephanie N. Seifert[4], Robert J. Fischer[4], Vincent J. Munster[4], Cynthia Goma-Nkoua[5], Jean-Vivien Mombouli[5], Dania M. Figueroa[4], Morgane Cournarie[1], Marc-Joël Akongo[1], and Serge D. Kaba[1]

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Central Africa remains a high-risk Ebola virus (EBOV) region, but the Republic of the Congo (RoC), home to the largest remaining populations of great apes, has not had an epidemic since 2005. EBOV ecology is not fully understood, but infected wildlife and consumption of animal carcasses have been linked to human outbreaks, especially in the Congo Basin. Since 2005, our One Health community-based wildlife mortality surveillance for EBOV has partnered with the Congolese Ministry of Health to reach communities and protected areas in northern RoC where people and great apes have died from past Ebola virus disease outbreaks. The outreach and surveillance are designed as an intervention to prevent contact between humans and infected animals and as an early warning system to locate carcasses or diseased animals and enable rapid detection of EBOV epizootics. From 2008 to the present day, we visited a total of 390 villages in four departments in the north of the RoC. We delivered the educational message to a total of 10 373 villagers who frequently visit the forest to gather food. Many villages were revisited each year. We achieved specimen collection by training over 100 project staff on a safe sampling protocol and equipping geographically distributed bases with sampling kits. We established in-country diagnostics, including the recent deployment of a carcass-side EBOV testing, reduced diagnostic turnaround time to 50 minutes, and demonstrated the absence of EBOV in 90 carcasses.

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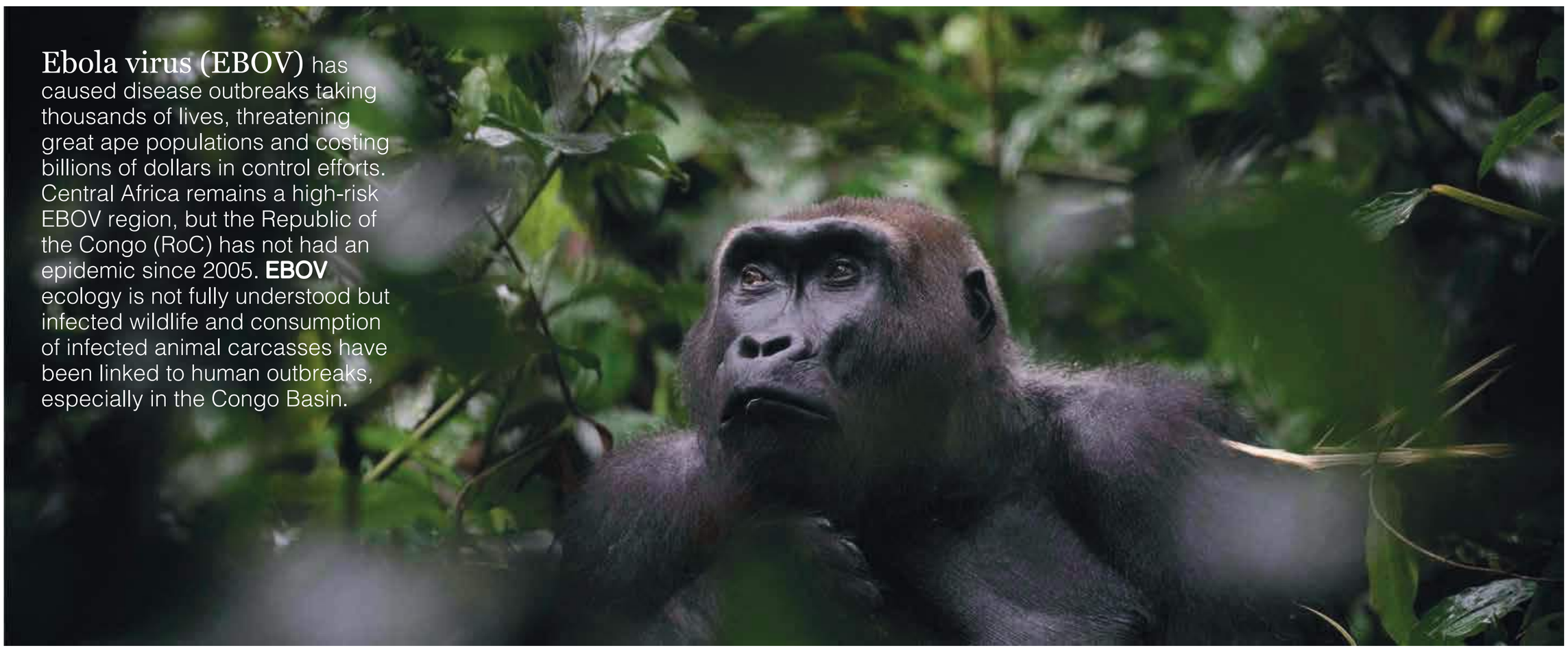


Ebola virus (EBOV) has caused disease outbreaks taking thousands of lives, threatening great ape populations and costing billions of dollars in control efforts. Central Africa remains a high-risk EBOV region, but the Republic of the Congo (RoC) has not had an epidemic since 2005. **EBOV** ecology is not fully understood but infected wildlife and consumption of infected animal carcasses have been linked to human outbreaks, especially in the Congo Basin.

Community Surveillance

Partnering with the Congolese Ministry of Health, since 2005 we have delivered educational messages to a total of 10 373 villagers in Northern Congo who frequently visit the forest to gather food, explaining what steps to take when they encounter a carcass in the forest to protect themselves and their community.

Early Warning Systems

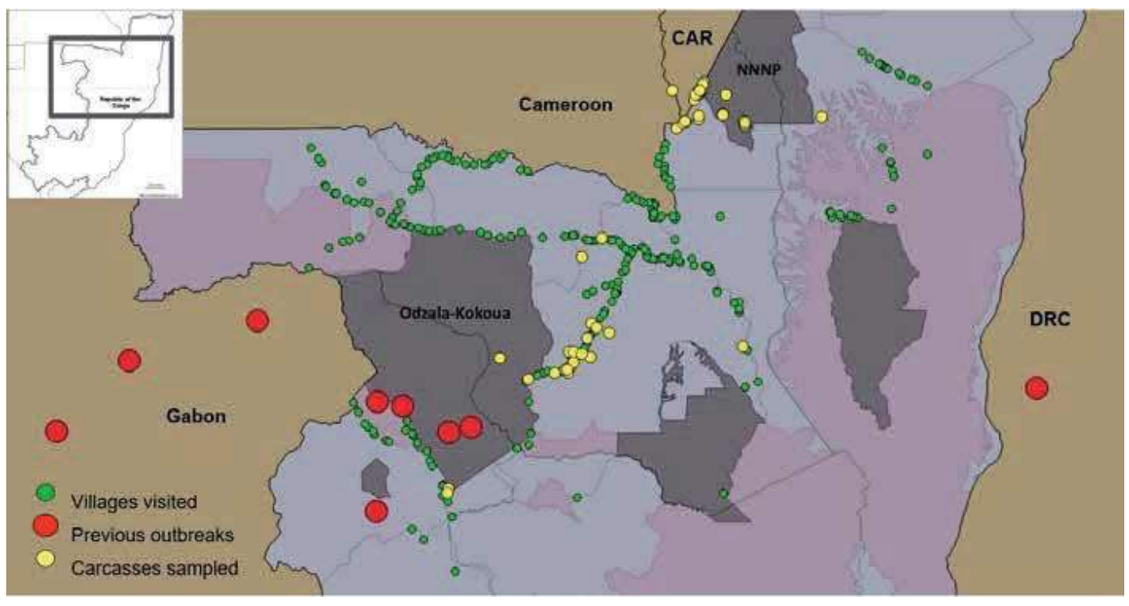
Designed for EBOV detection and to alert public health authorities, we established a low-cost community-based wildlife mortality reporting network covering 50 000 km2, relying on communities made aware of the risks posed by carcasses found in the forest.

Sampling and Training

Specimens are collected by staff who have been trained on a safe sampling protocol. These teams are geographically distributed and equipped with sampling kits. Over 100 people across five sites have received carcass sampling training."

Sample Diagnostics

We established a carcass-side testing with a Biomeme portable unit for EBOV, reducing the diagnostic turnaround time to 50 minutes, and demonstrated the absence of EBOV in 90 carcasses.



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Safety Practices and COVID-19 Stigma among Healthcare Workers in Malaysia

Jun How Ooi[1], Rosediani Muhamad[1], Rosnani Zakaria[1], Nik Rosmawati Nik Husain[2], Siti Azrin Ab Hamid[3], Maryam Mohd Zulkifli[1], Zainab Mat Yudin[4], Imran Ahmad[1], and Nur Suhaila Idris[1]
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The COVID-19 pandemic has caused an increased workload among healthcare workers in Malaysia, which may change their safety practices, perceived risk of COVID-19 infection, and cause stigma. To assess safety practices, perceived risk, risk coping strategies, and level of perceived stigma among frontline healthcare workers in Hospital Universiti Sains Malaysia, Kelantan, Malaysia. Methods: A cross-sectional study recruiting all frontline healthcare workers who have worked for three months during the COVID-19 pandemic in Hospital Universiti Sains Malaysia, excluding those who were unable to understand the Malay language. A self-administered validated online questionnaire including socio-demographic characteristics, safety practices, perceived risk, risk coping strategies, and stigma was used. Descriptive statistics were analyzed using SPSS software version 27. Two hundred thirteen eligible healthcare workers were recruited for this study. The majority of respondents adhered to correct safety practices regularly. A total of 79.7% of respondents felt they might contract COVID-19 infection. Two-thirds of respondents felt stressed, while 38.1% felt depressed during this pandemic. A total of 75.6% of respondents regularly performed spiritual and religious prayers as a risk-coping strategy, while maladaptive strategies, including smoking, drinking alcohol, and self-isolation, were less practiced. COVID-19-related stigma among respondents was mild.
Healthcare workers should be screened for mental health problems during the COVID-19 pandemic and offered appropriate counseling and treatment if required. A total of 79.7% of respondents had a high perceived risk of COVID-19 infection, with the majority performing a risk-coping strategy of spiritual and religious prayers. The majority of respondents practiced correct safety practices, while COVID-19-related stigma was mild.

Safety Practices and COVID-19 Stigma among Healthcare Workers in Malaysia

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Introduction

COVID-19 was declared to be a pandemic on March 11, 2020 by the Director-General of the WHO [1]. To date, there have been 2.80 million positive COVID-19 cases detected in Malaysia, with 31793 COVID-19 deaths as of 17 January 2022 [2]. This has put unprecedented pressure and extra workloads on healthcare workers (HCWs) worldwide, as well as in Malaysia. HCWs have a higher risk of contracting COVID-19 compared to the general population, which may be due to interaction with ill patients and/or potentially infectious co-workers [3,4]. Therefore, it is important to assess safety practices among HCWs. The risk perception of HCWs towards COVID-19 plays a vital role as it shapes their preventive behaviours regarding COVID-19 [5]. However, based on previous experience during severe acute respiratory syndrome (SARS) and Ebola outbreaks, a higher perceived risk was associated with adverse mental health outcomes [6,7]. Therefore, both adaptive and maladaptive risk coping strategies among HCWs need to be identified when facing the COVID-19 pandemic. HCWs are a group of people who may be labelled, stereotyped, and discriminated against because of a perceived link to the COVID-19 pandemic. HCWs who faced stigma were significantly associated with higher odds of insomnia, depression and anxiety [8].

Results

A. Socio-Demographic Characteristics, n=213
64.8% were female, 93.9% were Malay and 76.1% were married; mean age of 32.9 years (SD 6.20), with a duration of service of 6.0 years (IQR 7.0); 84% had attained tertiary level education; 74.6% had previously managed suspected or confirmed COVID-19 patients; 96.7% of respondents had already received the COVID- 19 vaccine.

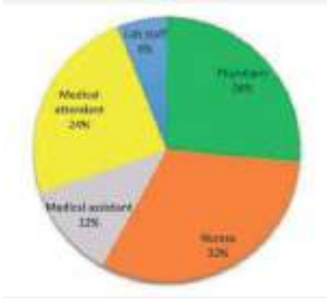

Figure 1. Occupation categories of respondents.

B. Safety Practices:

Most respondents carried out good safety practices regularly at work. The majority of them frequently advised patients on steps to prevent COVID-19 infection; 43.2% shortened patient consultation times, 34.3% changed regular non-acute patient appointments, 13.1% increased the duration of clinical service, while 12.7% prescribed antibiotics for upper respiratory tract infections lasting more than one week, in order to ensure continuity of clinical service; 78.4% strongly agreed to undergo home self-isolation after contact with a suspected COVID-19 patient, while 87.8% strongly agreed to sanitize the workplace after managing a COVID-19- positive patient.

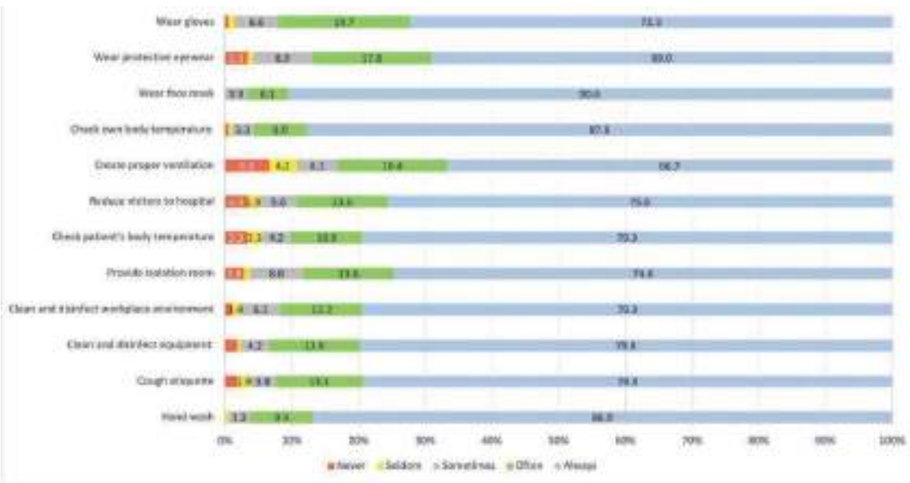

Figure 2. Frequency of safety practices performed in the workplace.

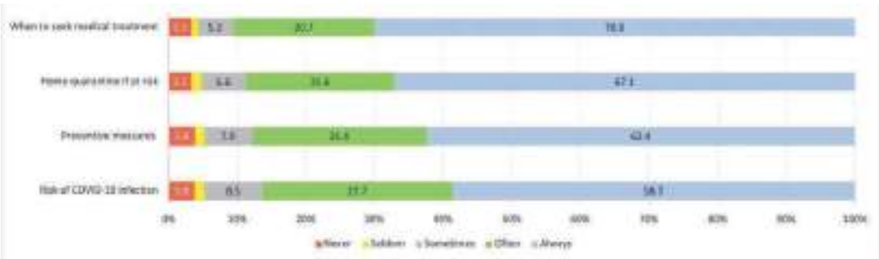

Figure 3. Frequency of advice given to patients to prevent spread of COVID-19.

C. Perceived Risk:

23.9% felt they will definitely contract COVID-19 infection in the future, while 30% felt it was probable and 25.8% felt that it was possible; 81.7% were worried about contracting COVID-19 infection due to their occupation; 88.8% were worried about family members becoming infected with COVID-19; 98.1% of respondents felt that the COVID-19 pandemic had affected their daily activities, while 93.4% felt it had affected their quality of life; Two-thirds of respondents felt stressed during the course of this pandemic, while 38.1% of respondents felt depressed.

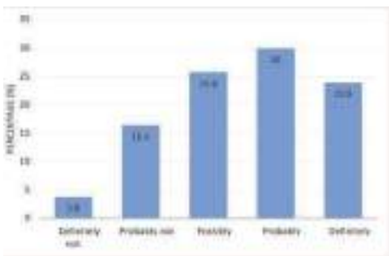

Figure 4. Perceived risk of COVID-19 infection.

Conclusions

The majority of HCWs adhered to correct safety practices regularly during the COVID-19 pandemic. A high perceived risk of COVID-19 contributed to better safety practices; however, it is associated with worry and stress. Most HCWs performed spiritual and religious prayers as a coping strategy. Maladaptive coping strategies such as smoking, drinking alcohol and self-isolation were less practised. COVID-19-related stigma was mild among HCWs in the Hospital Universiti Sains Malaysia. Mental health training and a psychological support team are needed to ensure good mental health among HCWs during the COVID-19 pandemic.

Objective

This study aims to determine safety practices, perceived risk, risk coping strategies and the level of perceived stigma among frontline healthcare workers in Hospital Universiti Sains Malaysia, Kelantan, Malaysia, while dealing with the COVID-19 pandemic.

Methodology

A cross-sectional study was conducted among frontline healthcare workers in Hospital Universiti Sains Malaysia, Kelantan, Malaysia, from June 2021 to August 2021. Participants: A total of 213 healthcare workers working as frontliners for at least 3 months' duration during the COVID-19 pandemic participated in this study by answering a self-administered online questionnaire. Research tool: A newly validated Safety Practices, Perceived Risk, Risk Coping Strategies and Stigma Questionnaire developed in Hospital Universiti Sains Malaysia in 2021 was used. Data analysis: Statistical analysis was undertaken using SPSS software version 27. Descriptive statistics were analysed.

D. Risk Coping Strategies:

75.6% of respondents regularly performed spiritual and religious prayers; Approximately half of respondents engaged in more conversations with family members, friends or colleagues, increased physical activity and performed relaxation techniques such as breathing exercises. Most respondents never drink alcohol (97.7%), smoke (95.8%) or take antidepressants (93.4%); The majority of respondents did not isolate themselves from friends and family (79.3%), contemplate changing work place (80.8%) or contemplate changing occupation (84.0%); Most respondents agree that mental health training (97.7%) and a psychological support team (97.2%) are needed during the COVID-19 pandemic.

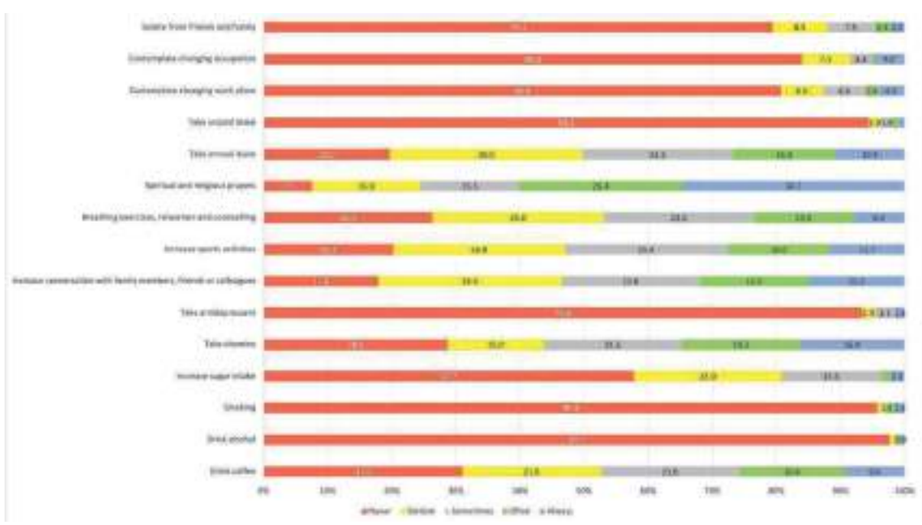

Figure 5. Frequency-of-risk coping strategies.

E. COVID-19-Related Stigma:

HCWs mostly disagreed that they were afraid to tell family members (82.2%) or others (83.5%) about their occupation; Most respondents did not feel like they lost friends (86.8%) or that their friends stayed away (82.6%); 53% did not feel guilty for causing others to be at risk of COVID-19 infection, while 77.5% did not worry that their family members would be isolated by others; Half of the participants stayed away from others to prevent the spread of COVID-19. Only a quarter of respondents felt lonely.

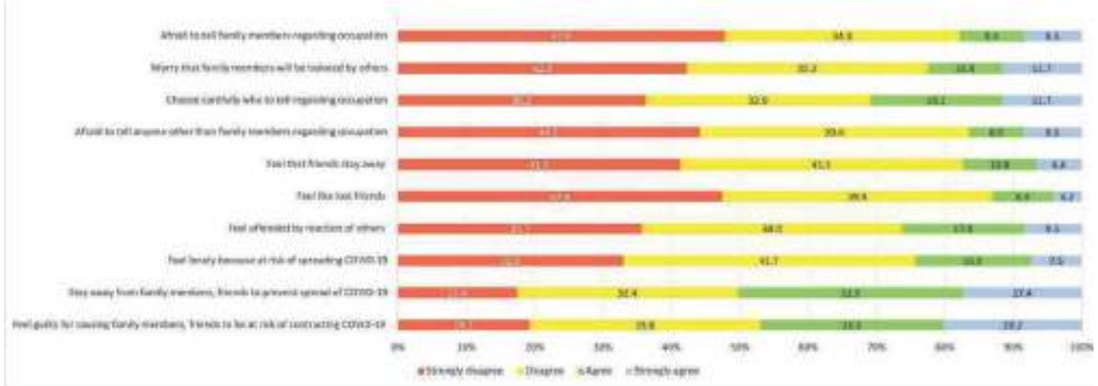

Figure 6. COVID-19-related stigma among HCWs.

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*Source of photo: pixabay.com (Free photos)

Reversing COVID-19 Effects: An mHealth Tool that Empowers Women to Improve Maternal Health and Maternity Care

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COVID-19 has caused a setback in achieving the maternal mortality target established in the Sustainable Development Goals. Women's empowerment is an internationally supported human-rights policy to improve maternity care and decrease maternal mortality. This research aimed to find an integrated solution to encourage women's participation and provide an integral evaluation of maternity care in Guerrero, Mexico. Three major objectives were pursued: conceptualization, testing, and local adaptation. For conceptualization, interdisciplinary research was conducted, and a prototype was designed. For testing, focus groups, interviews, and expert consultation were done in three target groups: women, health professionals, and public health leaders. For local adaptation, surveys were translated from English to Spanish according to WHO methodology and adapted to Guerrero's local context. In this phase, 358 women were surveyed with the support of 29 social workers, health professionals, and administrative staff. The integrated prototype was programmed and will be piloted in a future phase. An mHealth transdisciplinary tool with a women-centered approach would enable the environment to promote women's empowerment and health professionals' participation and operationalize global standards to improve maternity care quality. To achieve this, a tool that includes woman-reported outcomes was designed. Decreasing preventable maternal deaths requires the participation of all healthcare stakeholders: women, health professionals, social workers, community leaders, and public health authorities. A platform with a global health perspective will allow learning from different stakeholders and identify improvement areas for healthcare facilities. Four main challenges were found: cultural and institutional change, low literacy levels, connectivity, and COVID-19 restrictions. An integral evaluation tool to improve maternity care should have a woman-centered approach that empowers women by improving their skills for self-care during pregnancy and postpartum and ensuring their participation in maternity care programs. This tool should collect data from women and measure it routinely. An mHealth tool is a cost-effective solution that will empower women to improve maternal health.

Reversing COVID-19 Effects: An mHealth Tool that Empowers Women to Improve Maternal Health and Maternity Care

Authors

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COVID-19 has caused a setback in achieving the maternal mortality target established in the Sustainable Development Goals.

Due to COVID-19, Mexico has had a 60% increase in maternal deaths since 2019.

Guerrero is one of the most vulnerable states in Mexico: 68% of its population does not have enough income to afford the basic products to survive [1]. The maternal mortality ratio increased from 59.1 in 2019 to 72.4 in 2020 [2].

Human rights for maternity care. Women's empowerment is an internationally supported human rights policy to improve maternity care and decrease maternal mortality.

Promoting women's participation in maternity care. The project aimed to find an integrated solution to encourage women's participation to provide a complete and integral evaluation for maternity care in Guerrero, Mexico.

Decreasing Preventable Maternal Deaths Requires the Participation of All Healthcare Stakeholders

Transdisciplinary Approach for Maternity Care Improvement

A women -centered qualitative management tool was designed, and includes:

- Women-reported outcomes
- Women's experiences with care
- Health professionals' feedback

Methods:

1. Conceptualization (interdisciplinary research, prototype design);
2. Testing (focus groups, interviews, expert consultation);
3. Local adaptation: survey translation with WHO methodology [3] and pilot.

- 358 women in Guerrero were surveyed by 29 local social workers, health professionals, and administrative staff of the Ministry of Health of Guerrero.
- 173 women used the tool in Mexico.

Empowering women, empowering social workers

An integral evaluation tool to improve maternity care should have a woman- centered approach that empowers women by:

- Improving skills for self-care during pregnancy and postpartum;
- Ensuring their participation in maternity care programs.

An mHealth tool is a cost-effective solution that will empower women and social workers to improve maternal health.

Source: Ministry of Health, Guerrero, Mexico.

The application of the survey made women reflect on their condition and made them feel they were well cared for.

Confidence in taking care of the baby:

"I think it's a question that leaves me thinking since I'm a new mother and I hadn't thought of what to do."

Anxiety at childbirth:

"It is an adequate question. They care for what we feel in the moment."

Breastfeeding intention:

"It's interesting [the question] because it helps appreciate breastfeeding even before [giving birth]".

Surveyed mothers in Guerrero, Mexico.

Social workers also felt empowered

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Barriers to Healthcare Innovation Development by Countries of Differing Income Levels

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A variety of common problems with healthcare innovation exist within different countries. Many countries have conducted independent research about these obstacles. However, no international systematic review of problems has been conducted to link these issues with economic development. We hypothesized that countries of different income strata levels would be associated with different problems related to healthcare innovations. To test this hypothesis, we conducted a systematic review of publications on the problems and categorized them based on country income level. We conducted two systematic reviews of problems in healthcare innovation. We searched for relevant publications in Scopus to assess the international healthcare market (N = 267) and the Russian database (N = 181). Based on these articles, we obtained a set of problems and merged them into categories: 41 for Russia and 17 for the foreign market. We identified the most frequent problems in Russia (N = 5), then classified all the countries into three major categories: low and middle-income countries (LMI, N = 6), upper-middle-income countries (UMI, N=14), and high-income countries (HI, N = 18). Based on these categories, we identified the most frequent problems for each group and differentiated and compared them with Russian analysis. We identified three of the most common problems for HI counties (change and knowledge management, lack of management tools), three for UMI countries (education, finances, innovation process), and one for LMI countries (education). However, at least six identified problems were common between all three income categories: education, ethics, finances, infrastructure, management, and regulations. The primary difference between income categories was the nature of the identified problems. Comparison of the problem categories with Russian analysis allowed ensuring that countries of similar income share common problems. The nature of the most frequent problems in Russia corresponds with the UMI group. The results of our systematic review refute the hypothesis that the income level of countries is associated with different problems. It is not the problems themselves but their presentation that determines the country's innovative potential. Thus, for developing countries, it is potentially useful to apply solutions of the developed countries to solve existing problems.

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Introduction

A variety of common problems with healthcare innovation exist within different countries. Many countries have conducted independent research about these obstacles. However, no international systematic review of problems has been conducted to link these issues with economic development. We hypothesized that countries of different income strata levels will be associated with different problems related to healthcare innovations. To test this hypothesis, we conducted a systematic review of publications regarding the problems and categorized them based on country income level.

Methods

We conducted two systematic reviews of problems in healthcare innovation. We searched for relevant publications in Scopus for assessing the international healthcare market (N = 267), and in the Russian database (N = 181).

Final Sample Size

Income Groups	Number of countries
Low income (LI)	1
Lower-middle income (LMI)	3
Middle income (MI)	2
Upper-middle income (UMI)	14
High income (HI)	18

Limitations

1. The number of articles and databases used was limited.
2. Generally, databases publish articles with the most interesting data (publication bias). In this case, it is difficult to assess the true frequency and importance of problems.
3. There is no way to fully explore the problems in the innovative economy without an expert survey, which was not conducted within this study.
4. For more developed countries, there are more publications that describe the problems the innovation industry faces, making it impossible to conduct a systematic review that is uniformly representative for each economic group.

Results

Sixteen international key problems were identified (see Figure A).

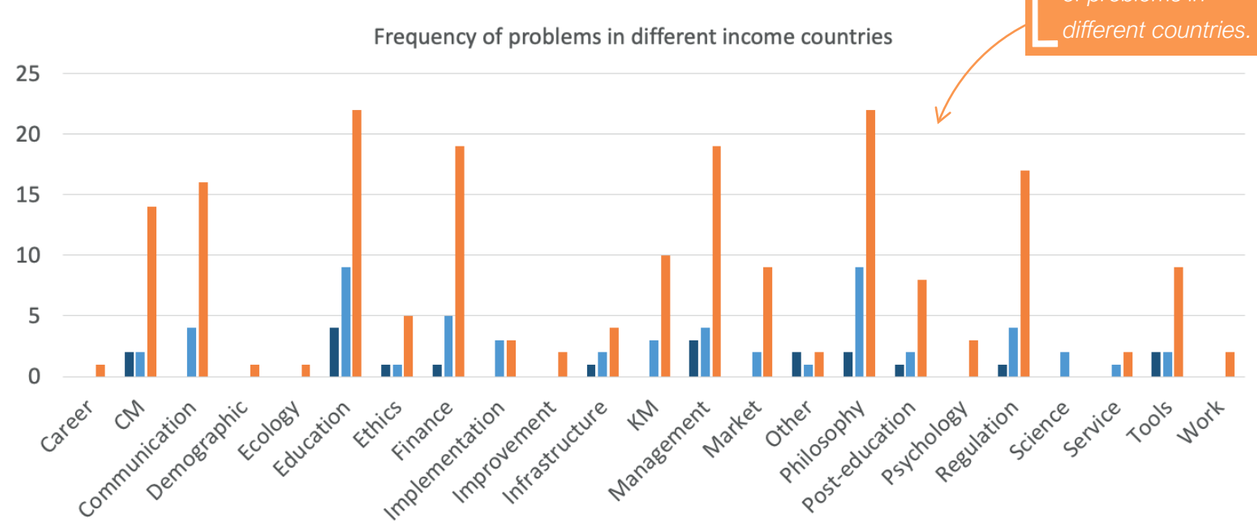

Figure 1. Frequency of problems in different countries.

CM – change management; KM – knowledge management.

Main Barriers for Development

	L&LMI&MI	UMI	HI
Change management	Attitude, Guidelines	Patients' behavior	Poor computer skills, Weak IT systems, Too much expectations, High speed of progress, slow CM, Hard to implement
Communication	X	Industry VS Academia	Different goals, Poor communication among stakeholders and poor collaboration between different disciplines, Industry VS Academia
Education	Limited resources and professionals, Quality	Complexity, Traditions, Complexity to conduct for rural areas, Cost	Curricula, Student management, Poor pedagogy, Cost and quality, Not innovation centered, Lack of entrepreneurship skills
Ethics	X	X	Distrust in entrepreneurs, Distrust in AI
Finance	Cost	Limited grants	Short-term budgeting, Cost-efficiency problems, High cost of failure
Infrastructure	Resource waste	Lack of laboratories	Rapid change of healthcare, Lack of facilities, Lack of internet access
Knowledge management	X	Too much data, Limited data analysis	Lack of data, Misinformation, No database of innovations, Different data formats, Weak systems capacity
Management	Resources	High security risks	Lack of time, instability, Security risks, High workload, Worker's turnover, Too much paperwork, Very complex teams
Market	X	High competition, Governmental influence	Lack of MVP, Lack of public engagement, Uncertainty, Lack of government support , Not linear innovation pathway, Fragmented healthcare market, Focus to software
Philosophy	Complex process of innovation development, Long process	Innovation centrality, Long process, Need of publications, Lack of academia support	Logic of innovative process, High risks, Orphans disease are customized, Inability to explain innovation without opening the competitive advantage, Complexity, Innovation centrality, Not focused on the problem, Innovation definition, High speed of progress, No innovations in academia (only for the industry), Very long process
Post-education	X	High requirements for professionals	Lack of Examples in the profession, Lack of access to employees, Poor computer skills, Lack of regular training, Lack of AI education
Psychology	X	X	Patient engagement, Worker's burnout
Regulation	IPs	Uncertainty, Poor classification, Lack of control agencies, Long process, Vague	Fear of law, Different interpretations, Differences in jurisdictions, Poor standards, Fragmentations, Too much time to regulate procedures, Long certification, Penalties
Specific Tools	Lack of market analysis	Lack of business models	No tools for communication with the public, Outdated measurements for innovations, Limited IT systems, Poor AI

Conclusion

- Although countries of varying development levels share common problems, these issues are different in nature.
- The most frequent problems among all countries are education, ethics, finances, infrastructure, management and regulations.
- There is a need for adequate unified training programs for teams of developers based on the best practices of high-income countries for solutions of relevant problems.
- Barriers of healthcare innovations can serve as a criterion to predict a country's development and identify its economical level.

Acknowledgments

This study has been supported by the Russian Science Foundation grant (Project No. 20-78-10157).

A Pilot Study Exploring the Feasibility of Using the Bornfyne Prenatal Management System (PNMS) Mobile Application to Increase Awareness of COVID-19 in Mumbwa District, Zambia

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Since the start of the COVID-19 pandemic, healthcare has seen the adoption of several digital solutions with the goal of accelerating progress toward Sustainable Development Goals and Universal Health Coverage.

The Bornfyne mobile application system, introduced in Cameroon in 2018, is a digital application that aims to increase access to maternal health services in rural parts of sub-Saharan Africa. The tool offers digital health technology adapted for resource-poor settings, with the potential to reduce maternal and neonatal morbidity and mortality and further support the COVID-19 response. This study aims to assess the feasibility of enrolling women into the BornFyne-PNMS project using household mobile phones and to increase awareness of COVID-19 in the Mumbwa District in the Central Province of Zambia. A cross-sectional study was conducted in two selected communities of the Mumbwa district between October 2021 and November 2021. Community health volunteers and the district medical team mapped out households in the catchment area and administered 470 surveys. Ethical approval and authority were obtained from the Ethics Committee and the Ministry of Health, respectively, in support of the study. Descriptive statistics were done using STATA software. Preliminary results indicate that of a total of 429 households surveyed, 424 (90.0%) had one or more pregnancies in the past year, while 383 (81.5%) were not vaccinated against COVID-19. Further, of the total 429 households, 219 (51.0%) owned a mobile phone, and 133 (30.5%) owned a smartphone. A total of 380 (81.55%) were willing to receive medical advice, and 414 (88.1%) were willing to listen to COVID-19-specific advice over the phone. This baseline survey demonstrates that the use of digital innovations such as the BornFyne PNMS is feasible in a rural district such as Mumbwa as a means to share reproductive and maternal advice, including advice on COVID-19 with potential to reduce maternal and neonatal morbidity and mortality in rural settings.

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Background

Since the start of the COVID-19 pandemic, healthcare has seen the adoption of several digital solutions with the goal of accelerating progress towards the Sustainable Development Goals and Universal Health Coverage.

The Bornfyne Mobile Application system, introduced in Cameroon in 2018, is a digital application which aims to increase access to maternal health services in rural parts of Sub- Saharan Africa. The tool offers digital health technology adapted for resource-poor settings, with the potential to reduce maternal and neonatal morbidity and mortality, and further potential to support COVID-19 responses.

Figure 1. Expectant woman using a mobile phone to communicate with a doctor in Nakanjoli village, Mumbwa, Zambia

Objective: This study aims to assess feasibility of enrolling women into the Bornfyne-PNMS project using household mobile phones and to increase awareness of COVID-19 in Mumbwa District, in the Central Province of Zambia.

Methods

A cross-sectional study was conducted in two selected communities of Mumbwa district between October 2021 and November 2021. Community health volunteers and the District Medical team mapped out households in the catchment area and administered 470 surveys. Ethical approval and authority were obtained from the Ethics committee and the Ministry of Health, respectively, in support of the study.

Descriptive statistics were presented using STATA software.

Figure 2. Midwife attending a pregnant woman using the Bornfyne-PNMS platform in Mumbwa District, Zambia.

Results

Preliminary results indicate that, of a total of 429 households surveyed, 424 (90.0%) had 1 or more pregnancies in the past year, while 383 (81.5%) were not vaccinated against COVID-19. Further, of the total 429 households, 219 (51.0%) owned a mobile phone and 133 (30.5%) owned a smartphone. A total of 380 (81.55%) were willing to receive medical advice and 414 (88.1%) were willing to listen to COVID-19- specific advice over the phone.

Conclusions

This baseline survey demonstrates that the use of digital innovations such as the Bornfyne-PNMS is feasible in a rural district such as Mumbwa as a means to share reproductive and maternal advice, including advice on COVID-19, with the potential to reduce maternal and neonatal morbidity and mortality in rural settings.

Epidemic Control for Volunteers: Training Conducted in the Gulmi District, Nepal, for the Preparedness of Community Volunteers Against Epidemics

Deepak Pokhrel[1] and Rujina Joshi[2]
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[2] IFRC Nepal Country Delegation, Kathmandu, Nepal

During the last three years of the Emergency Health Project in remote communities of the Gulmi district, the Nepal Red Cross Society conducted community-level training utilizing the Emergency Control for Volunteers (ECV) training resource of the International Federation of Red Cross and Red Crescent Societies (IFRC). The ECV has been developed and promoted by IFRC since 2008 to prevent and respond to epidemics and outbreaks. The presentation aims to share information about the training and its outcome at the community level. The ECV consists of a simple community message tool, action tool, and disease tool, including the concept of a One Health approach. The training was conducted in phases by utilizing the ECV manual. At first, Training of Trainers was conducted, and the subsequent roll-out training was executed by the trained Red Cross personnel. After the training, a roster was prepared of all trained community volunteers for their deployment. In total, 321 community volunteers (male: 92 and female: 229) were trained and mobilized, namely for diarrhoeal disease prevention, dengue prevention, and COVID-19 response and vaccination campaign. The training has been an effective way to prepare the community prior to any outbreak and deploy the trained volunteers to support hard-to-reach communities in case of an outbreak such as COVID-19.

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Introduction

The Gulmi district of Lumbini Province, Nepal, is one of the districts which has reported a growing incidence of reported cases of scrub typhus, dengue, and diarrheal diseases in the past years. In a three-year period (2018– 2020), the Nepal Red Cross Society implemented an Emergency Health Program, in which Epidemic Control for Volunteers (ECV) training was provided to community-based volunteers with a primary goal of developing the capability of the community to prevent and respond to epidemics and outbreaks.

Training Method

The training was conducted utilizing the ECV training resource of the International Federation of Red Cross and Red Crescent Societies. The training module consists of a simple community message tool, an action tool and a diseases tool, including the concept of a One Health approach.

Outcome

SN	Activities	Year 1	Year 2	Year 3	Total Trained HR		Total
					Men	Women	
1	ECV training of trainers	25			19	6	25
2	ECV roll-out training	100	52	142	73	223	296
	Total	125	52	142	92	229	321

SN	Activities
1	ECV volunteer mobilization for diarrhoea prevention
2	ECV volunteer mobilization for COVID-19 prevention
3	Volunteer mobilization for COVID-19 vaccination campaign
4	ECV volunteer mobilization for dengue prevention

Conclusion

ECV training has been proven to be a useful training tool for community- based volunteers to enhance their capacity in preventing and responding to disease outbreaks at a primary level. It is applicable for people at a community level who can implement and disseminate the information learnt at a grassroots level.

Figure 1. ECV- trained female community health volunteers.

Nepal Red Cross Society IFRC

"When I come, I forget all my worries": How Urban Green Spaces Support Population Health

Marion Porcherie[1], Anne Roué Le Gall[1], Marie-Florence Thomas[3], Zoé Héritage[4], Jean Simos[2], Nicola Cantoreggi[2], Zoé Vaillant[4], and Stéphane Rican[4]

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The COVID-19 pandemic has accentuated disparities in housing and living conditions, specifically for people who did not have access to a private garden or were denied access to a public urban green space (UGS) during the lockdown. Some countries, such as Austria, made the choice to let public UGS open, but not France. Based on the GREENH-City research carried out in cities of the French network of WHO healthy cities, this presentation aims to show that UGSs, depending on different drivers, can support a wide variety of physical and social activities but also offer multiple other functions that contribute more or less directly to the health of the population. A qualitative survey was conducted in 2018 among users of three different parks in each of the six selected cities. Both observations, semi-directive interviews, and thematic analyzes were performed. Observed activities were classified into eight groups, including physical activity (non-sport, sports). Interview analysis aimed to describe the reasons for coming and the type of activity made. In total, 186 observations and 591 recorded and unrecorded interviews with individuals or groups were conducted in the 18 parks. Twenty-four types of physical activity have been described as possible uses of UGSs. The most important, regardless of UGS's location, is children's activities in playgrounds. The most common activities are walking (with a social function) and jogging (individual function). Proximity and accessibility are two reasons for use. Security feeling is also one of importance. Most importantly, they provide a feeling of protection against the noise. As an open access amenity, UGSs are protective factors of population health.

They serve an important social function and affect the collective physical and mental health of the population in many different ways (e.g., as environmental risk regulators). They have played a major role in crisis coping for a population who had the chance to live nearby one of them. From a social justice perspective, policymakers should ensure that every neighborhood is sufficiently close to a UGS to ensure benefits for all.

"When I come to the park, I forget all my worries": How Urban Green Spaces Support Population Health

Authors

Marion Porcherie[1], Anne Roué Le Gall[1], Marie-Florence Thomas[1], Zoé Héritage[4], Jean Simos[3], Nicola Cantorreggi[3], Zoé Vaillant[2], and Stéphane Rican[2]

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Introduction

The COVID-19 pandemic has accentuated disparities in housing and living conditions, specifically for people who do not have access to a private garden or were denied access to a public urban green space (UGS) during the lockdown. Some countries, such as Austria, made the choice to let public UGS be opened, but France did not.

Based on the GREENH-City research carried out in cities of the French network of WHO healthy cities, we show:

- How UGSs, depending on different drivers, can support a wide variety of physical and social activities, but also offer multiple other functions that contribute more or less directly to the health of the population.

Methods

A qualitative survey was conducted in 2018 among users of 3 different parks in each of the 6 selected cities, and observations, semi-directive interviews and thematic analyses were performed.

Observed activities were classified into 8 groups, including physical activity (non- sport, sports).

The analyses of the interviews aimed to describe the reasons for coming and the type of activity carried out.

Results

A total of 186 observations and 591 recorded and unrecorded interviews with individuals or groups were conducted in the 18 parks.

A total of 24 types of physical activity types of physical activity have been described as possible uses of UGSs.

- The most important, regardless of UGS location, is children's activities in playgrounds.
- The most common activities are walking (with a social function) and jogging (individual function).

Proximity and accessibility are two reasons for use. Feelings of security are also of importance. Most importantly, they give a feeling of protection against noise.

Conclusions

As open-access amenities, UGSs are protective factors for population health. They serve an important social function and affect the collective physical and mental health of the population in many different ways (e.g., as environmental risk regulators).

They have played a major role in crisis coping for populations who had the chance to live near one of them.

From a social justice perspective, policymakers should ensure that every neighborhood is sufficiently close to a UGS to ensure benefits for all.

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Factors Related to Health Service Utilization among Adolescent Girls in Urban Slums of Jaipur, India

Rajnish Ranjan Prasad
IIHMR University, Bhopal, India

This study aimed to determine the factors associated with healthcare service utilization among adolescent girls in urban slums in Jaipur, India. A cross-sectional study of 417 adolescent girls was conducted.

Descriptive statistics, Chi-square, and bivariate and multivariate logistic regression were used to analyze the data and determine the factors associated with healthcare service utilization. Only 48% of girls with health problems visited healthcare facilities for treatment. A total of 69% delayed treatment three or more days after the onset of symptoms, and 86% first tried remedies available at home. Girl's education (AOR= 2.7; 95% CI=0.65-8.57), mother's education (AOR= 3.43; 95% CI=1.2-9.96), father's income (AOR=2.2; 95% CI= 0.76-5.32), mother's income (AOR= 3.67; 95% CI=1.03-11.18), and counseling by field health workers (AOR= 3.23; 95% CI=1.18-7.89) were factors significantly associated with utilization of health services. Girls cited parental neglect of their health, insufficient funds, lack of privacy, and inconvenient assessment times at health facilities as major barriers. The study shows that the utilization of facility-based health services among adolescent girls is low, and there is a significant postponement in visiting health facilities after the onset of symptoms. There is a need to create community-level awareness, improve outreach by field health workers, and ensure privacy in healthcare facilities.

Factors Related to Health Service Utilization among Adolescent Girls in Urban Slums of Jaipur, India

Authors

Rajnish Ranjan Prasad

IIHMR University

Introduction

a. In India, evidence shows that there is inequity in the utilization of health services by adolescent girls.

b. However, adolescent girls are not a homogeneous group, and depending on socioeconomic and demographic factors, some girls are more disadvantaged in the utilization of health services than others.

c. Hence, this study was undertaken to understand inequality in the utilization of health services among adolescent girls.

Findings

Variables		Home-based remedies (%)	Facility-based treatment (%)	Unadjusted OR (95% CI)	P
Predisposing Factors					
Girl's age	10-14 years	149 (73.4%)	54 (26.6%)	1	
	15-19 years	67 (31.3%)	147 (68.7%)	2.135 (1.136-4.799)	0.003
Girl's education	8th class or lower	157 (62.8%)	93 (37.2%)	1	
	Higher than 8th class	59 (35.3%)	108 (64.7%)	3.297 (1.470-9.214)	<0.001
Mother's education	8th class or lower	208 (56.4%)	161 (43.6%)	1	
	Higher than 8th class	8 (16.7%)	40 (83.3%)	3.771 (1.345-10.573)	<0.001
Father's education	8th class or lower	157 (59.7%)	106 (40.3%)	1	
	Higher than 8th class	59 (38.3%)	95 (61.7%)	1.837 (0.612-4.857)	0.002
Castes	SC and ST	114 (57.9%)	83 (42.1%)	1	
	General or OBC	102 (46.4%)	118 (53.6%)	1.148 (.861-3.989)	0.086
Enabling Factors					
Mother's employment	Labor or housewife	173 (60.3%)	114 (39.7%)	1	
	Salaried or self-employed	43 (33.1%)	87 (66.9%)	3.073 (1.869-7.002)	<0.001
Father's employment	Labor or unemployed	107 (71.3%)	43 (28.7%)	1	
	Salaried or self-employed	109 (40.8%)	158 (59.2%)	2.299 (1.942-5.605)	0.013
Girl's income	INR 7500 or less	167 (52.0%)	154 (48.0%)	1	
	INR 7501 or more	49 (51.0%)	47 (49.0%)	.817 (0.471-2.197)	0.864
Mother's income	INR 7500 or less	201 (58.9%)	140 (41.1%)	1	
	INR 7501 or more	15 (19.7%)	61 (80.3%)	4.238 (1.447-12.703)	<0.001
Father's income	INR 7500 or less	162 (57.0%)	122 (43.0%)	1	
	INR 7501 or more	54 (40.6%)	79 (59.4%)	2.525 (1.075-5.928)	0.007
Outreach by field workers	No	143 (80.8%)	34(19.2%)	1	
	Yes	73 (30.4%)	167 (69.6%)	3.450 (1.679-8.685)	<0.001
Need Factors					
Health problem	General health problem	130 (57.3%)	97 (42.7%)	1	
	Reproductive health problem	86 (45.3%)	104 (54.7%)	1.466 (0.761-3.884)	0.048
Severity of symptoms	Mild	94 (70.1%)	40 (29.9%)	1	
	Severe	122 (43.1%)	161 (56.9%)	1.457 (0.516-3.063)	0.073

Association between health service utilization and independent variables (chi-square and binary logistic regression).

Methodology

a. The study was carried out using mixed methods in the urban slums of Jaipur (capital city of Rajasthan, India).

b. The study was designed using the Andersen Healthcare Utilization Model to examine the factors that affect the utilization of health care services among adolescent girls in Jaipur's urban slum.

c. The sample size for the study, with a 95% confidence level, 5% error margin, and 10 %non-response rate, was 420 adolescent girls.

d. A total of 417 girls responded to the interview, and 7 FGDs (12 girls in each FGD) were conducted with the adolescent girls to collect in- depth qualitative information.

Results

a. Only 48.2% of girls with health problems visited healthcare facilities for treatment.

b. A total of 68.6% delayed treatment by three or more days after the onset of symptoms, and 85.6% first tried remedies available at home.

c. Girl's education (AOR= 2.7; 95% CI=0.65-8.57), mother's education (AOR= 3.43; 95% CI=1.2-9.96), father's income (AOR=2.2; 95% CI=0.76-5.32), mother's income (AOR= 3.67; 95% CI=1.03-11.18), and counselling by field health workers (AOR= 3.23; 95% CI=1.18-7.89) were factors significantly associated with the utilization of health services.

d. Girls cited parental neglect of their health, insufficient funds, lack of privacy, and inconvenient assessment times at health facilities as major barriers.

Conclusions

a. The findings from the study show that the utilization of facility-based health services among adolescent girls is low, and there is a significant postponement in visiting health facilities after the onset of symptoms.

b. There is a need to create community- level awareness, improve outreach by field health workers, and ensure privacy in healthcare facilities to improve facility-based health service utilization among adolescent girls.

Impacts of Air Pollution on Health and Cost of Illness in Jakarta, Indonesia

Vivian Pun[1], Ginanjar Syuhada[2], Adiatma Yudistira Manogar Siregar[3], Adhadian Akbar[3], Donny Hardiawan[3], Adi Darmawan[4], Sri Hayyu Alynda Heryati[4], Raden Driejana[5], Sumi Mehta[2], Daniel Kass[2], and Ririn Radiawati Kusuma[2]

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Air pollution is a major threat to the 10 million people living in greater Jakarta, where annual ambient PM2.5 concentrations are the highest among Indonesia's urban centers and several times higher than WHO health-based guideline levels. Conservative modeled estimates from the Global Burden of Disease (GBD) study suggest that air pollution caused over 5000 deaths in Jakarta in 2019. This study uses local air quality and health data from the Environmental Agency of DKI Jakarta and the Jakarta Health Agency to quantify the health and economic impacts of air pollution in DKI Jakarta Province, including 1) health impacts due to air pollution, focusing on adverse health outcomes in children, premature mortality, and daily hospitalizations, and 2) economic impact associated with air pollution-related health impacts. The health burdens attributable to air pollution were estimated using the latest GBD 2019 methodology and the best available concentration-response functions. The economic burden associated with the health impacts of air pollution was calculated using cost-of-illness and the value of statistical life year approaches. Over 7,000 adverse health outcomes in children, over 10,000 deaths, and over 5,000 hospitalizations can be attributed to air pollution each year. The total cost per year of these health impacts reached approximately IDR 41.2 trillion, or around 2.2% of Jakarta's gross domestic, regional product, with almost all costs due to premature deaths. Results will inform the design of solutions to address priority sources of pollution with a public health lens. The approach is also replicable to other geographies concerned about the impact of air quality and is already being adapted for use in Sao Paolo, Brazil.

Impacts of Air Pollution on Health and Cost of Illness in Jakarta, Indonesia

Authors

Vivian Pun[1], Ginanjar Syuhada[2], Adiatma Yudistira Manogar Siregar[3], Adhadian Akbar[3], Donny Hardiawan[3], Adi Darmawan[4], Sri Hayyu Alynda Heryati[4], Raden Driejana[5], Sumi Mehta[2], Daniel Kass[2], and Ririn Radiawati Kusuma[2]

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Abstract: Poor air quality has been strongly linked to non-communicable diseases, including chronic heart and lung disease, and adversely affects children and the elderly, our most vulnerable members of society. This study quantifies the health and economic impacts of air pollution in Jakarta Province, the capital of Indonesia, including 1) adverse health outcomes in children, premature mortality, and daily hospitalizations, and 2) the cost of air-pollution-related health impacts. Methods: We evaluated the health and economic impacts of PM2.5 and ozone, both of which exist at levels exceeding the Indonesian National Ambient Air Quality Standard and the World Health Organization's health-based guidelines. We selected the following health outcomes: adverse health outcomes in children, adverse birth outcomes, mortality, and hospitalizations. We calculated the annual average concentration of PM2.5 and O3 to estimate mortality and adverse health outcomes in children attributable to air pollution. Meanwhile, the 24- hour average (for PM2.5) and the 8-hour average (for O3) were calculated to estimate hospitalizations attributable to air pollution. The health burdens attributable to air pollution were estimated using the latest Global Burden of Disease Study 2019 study methodology and the best available concentration-response functions. The economic burdens were calculated using cost-of-illness and the value of statistical life-year approaches. In Jakarta, over 7,000 adverse health outcomes in children, over 10,000 deaths, and over 5,000 hospitalizations can be attributed to air pollution each year. The total cost per year of the health impact of air pollution has reached approximately IDR 41.2 trillion, around 2.2% of Jakarta Province's GDRP. The current study fills important knowledge gaps about the health impacts of air pollution in children. The study findings also provide timely and valuable inputs for the Environmental Agency's Grand Design to identify and understand the full magnitude of the air pollution burden in Jakarta, and to formulate clean air solutions.

Introduction

Air pollution is a major threat to the 10 million people living in the Jakarta area. Based on the data from the Environmental Agecy of DKI Jakarta, the annual ambient PM2.5 conce ntrations in Jakarta are the highest among all of Indonesia's urban centers. Conservative estimates from the Global Burden of Disease study suggest that air pollution caused 5,054 deaths and 168,000 years were lost to ill-health, disability, or premature death in DKI Jakarta Province in 2019.

Global evidence on the adverse health impacts of air pollution is consistent and clear. Air pollution has detrimental effects for all age groups in our society. Poor air quality has been strongly linked to non-communicable diseases (NCDs), such as cardiovascular and chronic respiratory diseases and lung cancers, and it adversely affects children, our most vulnerable members of society. Being exposed to polluted air may have prolonged impacts on children's health (e.g., impaired cognitive and socioemotional development), and can lead to an increased risk of chronic respiratory illness, cardiovascular disease, and diabetes throughout life.

This study quantifies the health and economic impacts of air pollution in DKI Jakarta Province, the capital of Indonesia. First, this study calculates the health impacts due to air pollution, focusing on adverse health outcomes in children, premature mortality, and daily hospitalizations. Second, the study estimates the economic impact associated with air-pollution-related health impacts. The results of this study will deliver valuable inputs for the Grand Design conducted by the Environmental Agency to identify and understand the full magnitude of the air pollution burden in Jakarta, and for the formulation of solutions to address priority sources of pollution.

Results

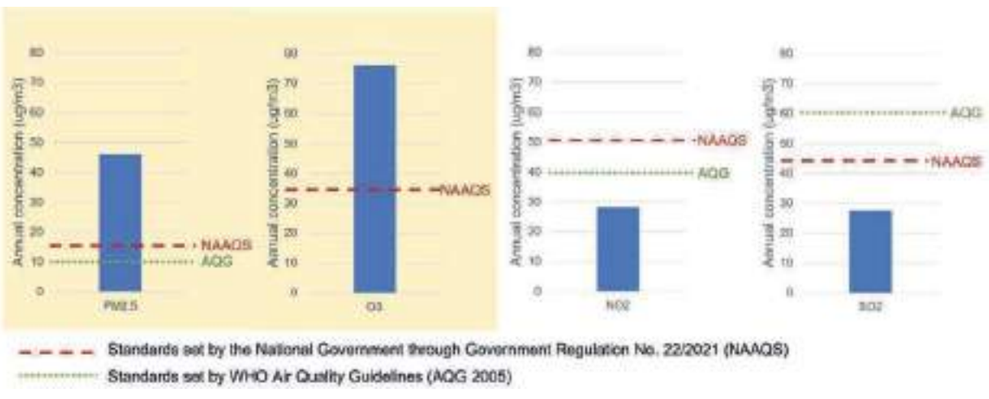

Figure 1. Air quality levels in Jakarta, 2019.

Methods

We evaluated the health and economic impacts of PM2.5 and ground-level ozone, both of which exist at levels exceeding the Indonesian National Ambient Air Quality Standard (NAAQS) and the World Health Organization's health-based guidelines. We calculated the annual average concentration of PM2.5 and O3 to estimate mortality and adverse health outcomes in children attributable to air pollution. Meanwhile, the 24-hour average (for PM2.5) and the 8-hour average (for O3) were calculated to estimate hospitalizations attributable to air pollution. Daily air pollution data for 2019 were provided by the Environmental Agency of DKI Jakarta. Daily average concentration levels for PM2.5, O3, NO2, and SO2 were collected from the air quality monitoring stations located in five districts: Central Jakarta, North Jakarta, South Jakarta, East Jakarta, and West Jakarta.

According to the available risk estimates from the Global Burden of Disease (GBD) Study 2019 and the epidemiologic literature, we selected the following health outcomes:

- Adverse health outcomes in children: stunting, infant deaths, and adverse birth outcomes (preterm births and low birth weight);
- Mortality: total mortality, and six categories of cause-specific mortality (ischemic heart disease (IHD), chronic obstructive pulmonary disease (COPD), stroke, lung cancers, type 2 diabetes mellitus, and lower respiratory infection (LRI));
- Hospitalizations: two hospital admissions from cardiovascular diseases and respiratory illnesses.

The health burdens attributable to air pollution were estimated using the latest GBD Study 2019 study methodology and the best available concentration-response functions. The economic burdens associated with the health impacts of air pollution were calculated using cost-of-illness and the value of statistical life-year approaches.

Table 1. Impacts of annual exposure to PM2.5 and ground-level ozone on mortality and adverse outcomes in children, 2019.

Health outcomes	Total burden	Air Pollution Attributable Indicators: Number of cases	Rate
$PM_{2.5}$ (annual mean: 52 µg/m³)			
Adverse outcomes in children (2019)			
Infant deaths	986	327	2 per 1,000 births
Stunting	11,211	6,153	7 per 1,000 children under 5
Low birth weight	1,269	680	5 per 1,000 births
Preterm births	1,919	62	4 per 10,000 births
Mortality (2019)*	23,430^	9,692	88 per 100,000
Ground-level O_3 (annual daily max 8-h average: 162 µg/m³)			
Mortality due to COPD (2019)*	3,635	310	5 per 100,000 aged 25+

* Hybrid approach: mortality count is calculated by multiplying Jakarta population (from BPS) with mortality rate (from GBD 2019 Study).

^ Total mortality include deaths from ischemic heart disease, stroke, COPD, type 2 diabetes, lower respiratory infections, and lung cancer.

Table 2. Impacts of daily exposure to PM2.5 and ground-level ozone on hospitalizations, 2019.

Hospitalizations	Cause of hospital admission: Cardiovascular disease	Respiratory disease
$PM_{2.5}$		
Total hospitalizations	150,272	108,560
$PM_{2.5}$ attributable indicators		
Number of cases	3,043	455
Rate (per 100,000 population)	29	4
Ground-level O_3*		
Total hospitalizations	37,039	12,147
O_3 attributable indicators		
Number of cases	1,357	182
Rate (per 100,000 population age 65+)	281	38

*Ozone-related outcomes are only for age 65 years and over

Table 3. Annual economic cost of health impact attributable to air pollution in DKI Jakarta (in billion IDR), 2019.

	Adverse Children Health Outcomes: Infant deaths	Stunting	Adverse birth outcomes*	Mortality	Hospitalizations
Health burden	327	6,153	742	10,002	5,037
Economic cost (in IDR)	1,301	11	15	39,794	87

*Combining babies born low birth weight and preterm birth

Conclusions

We estimated that, each year, air pollution causes more than 10,000 deaths, more than 5,000 hospitalizations for cardio-respiratory diseases, and more than 7,000 adverse health outcomes in children. The total economic burden attributable to air pollution was estimated to be IDR 52.1 trillion (2.2% of GRDP). The study findings provide valuable inputs for the Environmental Agency's Grand Design to identify and understand the full magnitude of air pollution burden in Jakarta, and to formulate clean air solutions.

Acknowledgments

This project was funded with support from Bloomberg Philanthropies. We thank the Environmental Agency of DKI Jakarta for providing us with the air quality data and the Health Agency of DKI Jakarta and the Indonesia Healthcare and Social Security Agency (BPJS) for providing us with the health data.

"Champions in Action": Resilience-Building Through a Novel Approach for Communication during the COVID-19 Pandemic

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COVID-19 is a multi-faceted global crisis in the new millennium. Pandemic fatigue impacts the majority, making them less confident in their role in controlling virus transmission. People were more resistant to hearing advice from experts on public health measures during the fatigue phase of the pandemic. Thus, novel participatory approaches for communication were much needed to combat COVID-19. The objective of this project was to build health and socioeconomic resilience among the public through community-led communication and sharing their own success stories during the pandemic. Nominations were obtained by grassroots level health workers and self-nominators through a pre-advertised telephone number. "Champions" were selected based on random observations and in-depth interviews. Representation of different socioeconomic backgrounds was ensured. Three experts representing relevant locality, the Ministry of Health, and the media were involved in the selection process. A news segment was designed and telecasted regularly over three months in a government media channel to introduce the "champions of new normalcy" and utilize them as change agents to the community; it was telecasted from December 2020 for more than three months regularly. Two minutes of prime-time news was dedicated to this segment. It was marketed as a new year's gift for 2021 from the Ministry of Health and the government media channel to the Sri Lankans. Resilient occupational settings and individuals who successfully continued their economic activities using innovative approaches were identified and introduced. This was an opportunity to share their real experience of "successful change" and its benefits with the public. The news segment was published as "Rise again 2021–move forward with confidence" ("Yali nagitimu 2021, Vishvasayen Perata"). The message was well-received by the public, and the participants were identified as heroes within their community. The feedback from the participants confirmed an increase in their customer base after the program and was accepted as a healthy setting by the community. The proposed model can be identified as one of the best practices in Sri Lanka, shifting the communication strategies from one-way communication at the initial stages of the pandemic towards community-led communication during the pandemic fatigue.

"Champions in Action": Resilience-Building Through a Novel Approach for Communication during the COVID-19 Pandemic

Authors

Priyanga Ranasinghe and Hemantha Herath

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Introduction

- COVID-19 is a long-lasting public health emergency. Pandemic fatigue made people more resistant to public health advice.
- Novel participatory approaches of communication were much needed to combat COVID-19.

Objective

- To build health and socioeconomic resilience among the public through community-led communication and sharing their own success stories during the pandemic.

Methodology: Sample Selection

- People and occupational settings were selected in two steps:

Step 1

1. Nominations from grassroots-level health workers;
2. Self-nominators through a pre-advertised telephone number;
3. Random observation of communities/in- depth interviews.

Step 2

A team of three experts representing the relevant locality, the Ministry of Health (MoH) and the media visited these places to finalize a "Champion" of new normalcy.

Project Implementation

- A wide range of socio-economic backgrounds across society from various parts of the country were included;
- A news segment was designed and telecasted regularly over three months in collaboration with the Sri Lanka Rupavahini Cooperation (SLRC) to introduce the champions of new normalcy;
- SLRC dedicated two minutes of prime-time news to these success stories;
- It commenced from 27th December 2020;
- The news segment was marketed as a new year gift for 2021 from MoH and SLRC to all Sri Lankans;
- The process was conducted with the informed consent of individuals and organizations.

Results

- The proposed and tested model is an innovative, well-accepted, motivational communication approach involving resilient people during pandemic as "change agents".
- It is identified as one of the best practices of RCCE in Sri Lanka, shifting the communication strategies from one-way communication in the initial stages of the pandemic towards community engagement and participatory approaches during the pandemic fatigue stage.

Strengths

- A review of community action;
- Best practice sharing and lessons learnt by the community in a storytelling mode;
- Community-led, participatory innovative communication approach;
- Multisectoral joint effort with the involvement of all levels, including grassroots-level workers;
- Whole-society approach to ensure community engagement.

Conclusions

- The proposed and tested model is an innovative, well-accepted, motivational communication approach involving resilient people during pandemic as "change agents".
- It is identified as one of the best practices of RCCE in Sri Lanka, shifting the communication strategies from one-way communication in the initial stages of the pandemic towards community engagement and participatory approaches during the pandemic fatigue stage.

Acknowledgements: Former chairman of SLRC, Dr. Nihal Jayathilaka, News Director, Indika Marasinghe, and the News crew of SLRC and regional reporters of SLRC who supported with camera and video processes.

Adopting the One Health Approach through Increasing Meaningful Multi-Sectoral Collaboration and Strong Surveillance System

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One Health (OH) is a multi-sectoral and interdisciplinary approach to managing the human, animal, and ecosystem determinants of health. Despite strong support for the OH approach, there are still many challenges to its operationalization. COVID-19 is a new example of zoonosis disease with a substantial global impact, which requires an OH approach for mitigation. In this comparative study, we examine the extent to which the OH approach has been used in tackling COVID-19 macro-policies in six selected countries. This is a qualitative study conducted based on systematic document analysis related to COVID-19 macro-policies in six selected countries (South Korea, Australia, Canada, Finland, United Kingdom, and Iran) from Jan 2020 to Sep 2021. We retrieved related documents from the official websites of the Parliament, central government, and Ministry of Health of the selected countries. Using a combination of deductive and inductive approaches, data were extracted, analyzed, and compared. Document content analysis revealed that a strong and integrated surveillance system, including early detection and risk mitigation response (improving the laboratory diagnostic capacity), contact tracing, etc., was the main component of the OH approach in the policies of all countries except for Iran. Although we found some trace of multi-sectoral collaboration in the analyzed policies of all selected countries, evidence suggests that the OH approach was not considered in formulating these policies. Indeed, stakeholders from the animals and environmental sectors were less engaged in formulating such policies. A more instrumental OH approach is needed for more efficient management of outbreaks. We, therefore, advocate that to build up a more resilient health system to respond to public health challenges efficiently, two new dimensions need to be added to the WHO's six building blocks framework, including 1) meaningful inter-sectoral collaboration and 2) functioning global health surveillance and response system. The potential threats of outbreaks are increasing due to globalization, unsustainable global development, and climate change. Therefore, adopting the OH approach through increasing meaningful multi-sectoral collaboration and a strong surveillance system might be the right strategy to prevent, control, and mitigate the outbreaks and minimize both public health and socio-economic consequences of such diseases worldwide.

Adopting the One Health Approach through Increasing Meaningful Multi-Sectoral Collaboration and Strong Surveillance System

Authors

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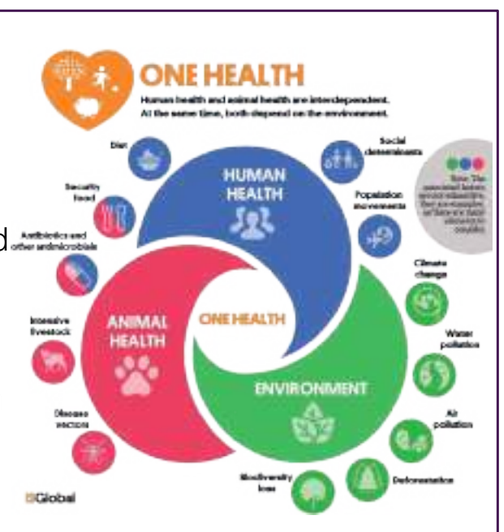
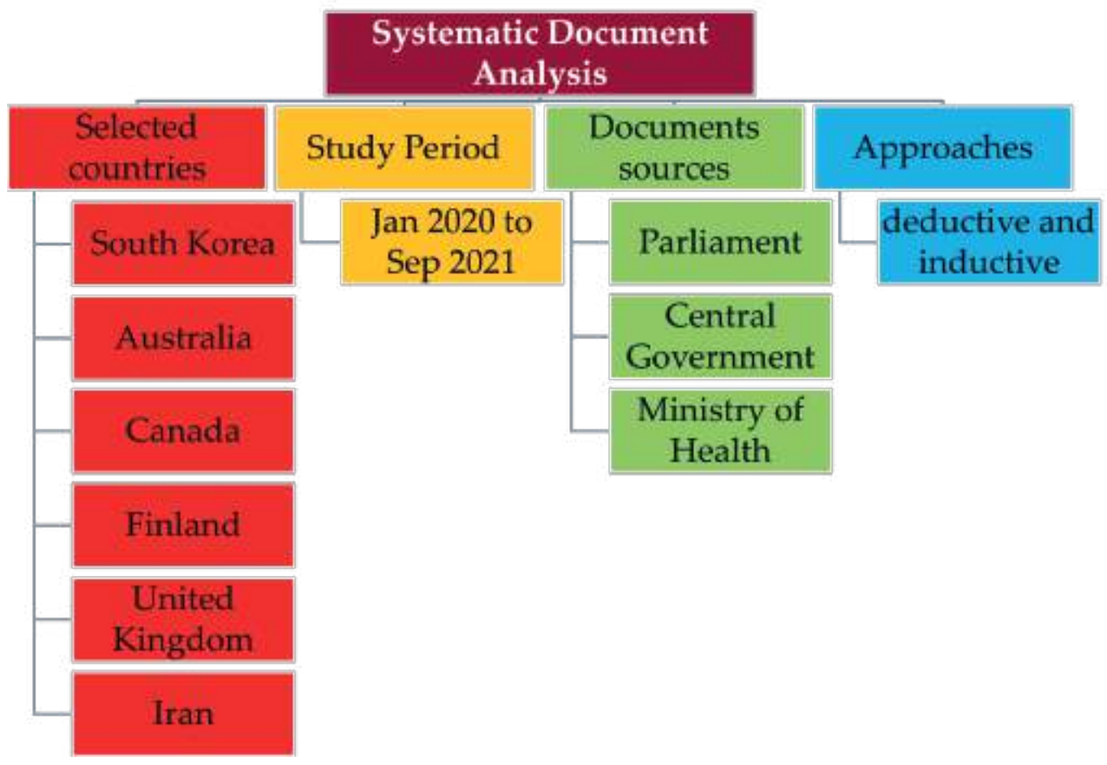
Introduction

- Microbial agents not only affect public health, but also weaken societies; destroy social structures; destabilize countries; affect the economy and trades; and overshadow the relationship between governments and people.
- Many microbes, so-called "zoonosis", infect both animals and humans, because they share the ecosystems in which they live.
- Efforts by just one sector cannot prevent or eliminate the problem.
- The One Health (OH) approach is essential in the process f developing and implementing policies, programs, and measures.
- Despite strong support for the OH approach, there are still many challenges to its operationalization.
- The COVID-19 pandemic is a new example of zoonosis disease with substantial global impact, which requires OH approach for mitigation.
- In this comparative study, we examine the extent to which the OH approach has been used in tackling COVID-19 macro-policies in six selected countries.



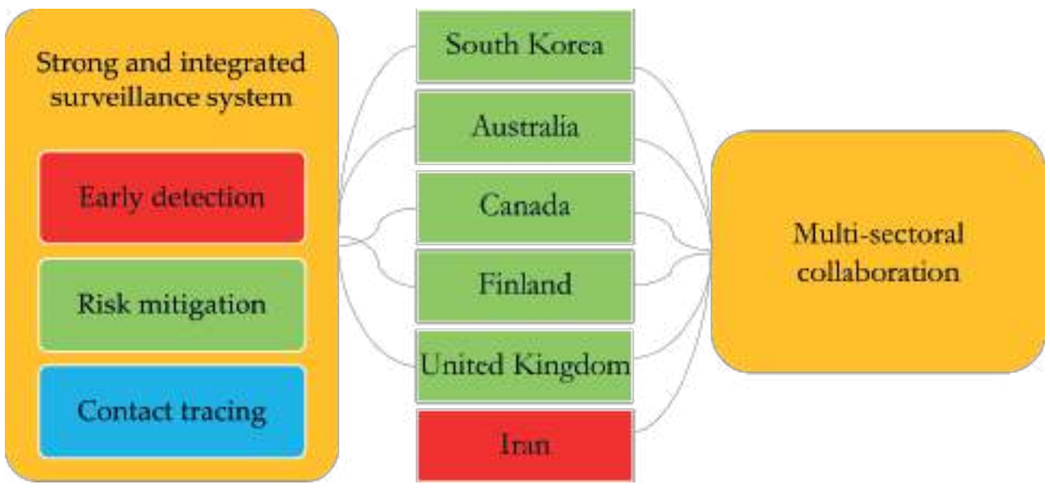
Methodology

- This is a qualitative study conducted based on systematic document analysis related to COVID-19 macro-policies in six selected countries.
- Using a combination of deductive and inductive approaches, data were extracted, analyzed, and compared.



Results

- Strong and integrated surveillance system, including early detection, risk mitigation response (improving the laboratory diagnostic capacity), contact tracing, etc., was the main component of OH approach in the policies of all selected countries, except for Iran.
- Although we found some trace of multi-sectoral collaboration in the analyzed policies of all selected countries; evidence suggest that:
- OH approach was not considered in formulating these policies.
- Stakeholders from animals and environmental sectors were less engaged in formulating such policies.

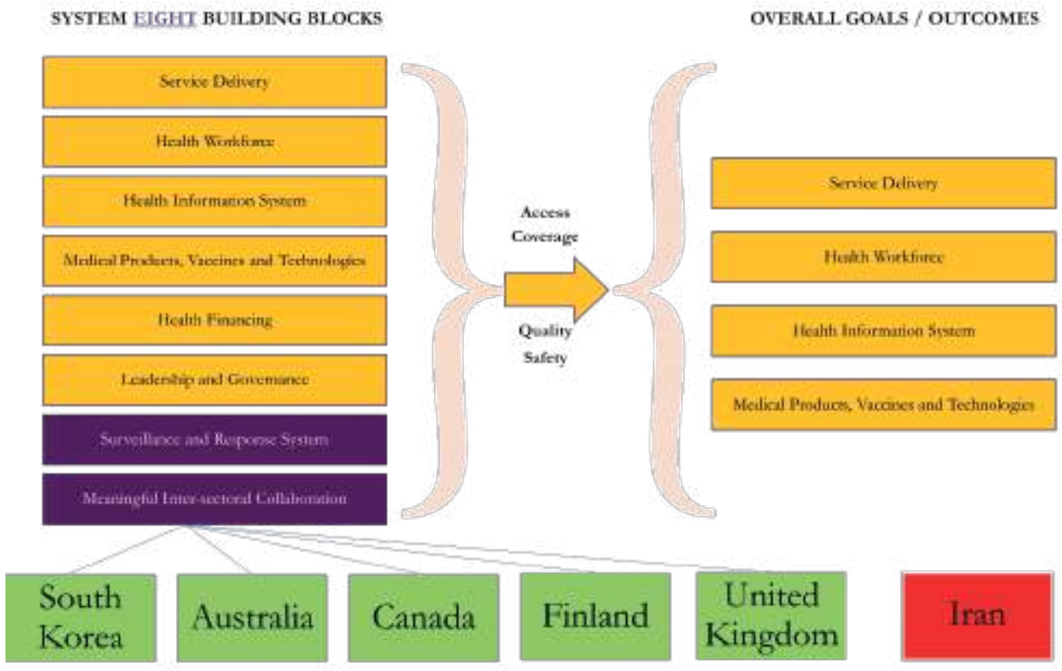


Discussion and Conclusions

- To build up a more resilient health system to respond to public health challenges efficiently, two new dimensions need to be added to the WHO's six building blocks framework:

✓ meaningful inter-sectoral collaboration
✓ functioning global health surveillance and response system.

- Adopting the OH approach through increasing meaningful inter-sectoral collaboration and strong surveillance system might be the right strategy to prevent, control, and mitigate the outbreaks and minimize both public health and socio-economic consequences of such diseases worldwide.



Acknowledgements

We would like to express our sincere appreciation to all experts who gave us advice to conduct this study.

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Building a More Resilient Health System through Strengthening the Health Surveillance System in Iran

Azam Raoofi[1,2] and Amirhossein Takian[1,2,3]

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The risk of microbial threats to global health has increased due to globalization. The Center for Disease Control and Prevention (CDC) in Iran is responsible for preventing, controlling, monitoring and responding to microbial threats, including emerging and re-emerging infectious diseases, zoonosis, vector-borne diseases. Nevertheless, COVID-19 revealed insufficient efficiency of CDC in Iran to respond to the health threats. Our research aims to strengthen the CDC and health surveillance system in Iran using the health system strengthening (HSS) good governance approach. This is an ongoing qualitative study based on both deductive and inductive approaches. First, using systematic document content analysis and through the lenses of the health policy triangle and the stage heuristic model, policies related to microbial threats in Iran (Nov 2016–Oct 2021) were analyzed. We conducted five semi-structured interviews, which will continue until saturation, and identified a list of relevant actors for stakeholder network analysis. Using the Health Policymaking Governance Guidance Tool, we explored good governance in the policy formulation process to respond to the microbial threats and identify policy options to strengthen CDC governance in Iran. The next step will be policy option prioritization through policy dialogue and the VIKOR method. Finally, we will develop and validate a practical model for strengthening CDC and health surveillance systems in Iran using the Walker & Avant method. Through documents content analysis, we classified policies into eight main themes, including vaccination, policy and research priorities, financing, monitoring and evaluation, accountability and responsibility, information sharing, economic support, and vulnerable groups. Findings on COVID-19 policies led to the identification of 6 themes and 33 sub-themes in the content, 5 themes and 30 sub-themes in the context, and 6 themes and 19 sub-themes in the process categories. The analysis of positions and powers of the 33 identified actors showed that the supreme leader of Iran has the most power and provides the most support to these policies. Our findings might serve as a roadmap to facilitate evidence-based policymaking with a whole-government, whole-society approach, meanwhile increasing multi-sectoral collaboration and strengthening the governance of health surveillance systems in Iran and similar settings.

Building a More Resilient Health System through Strengthening the Health Surveillance System in Iran

Authors

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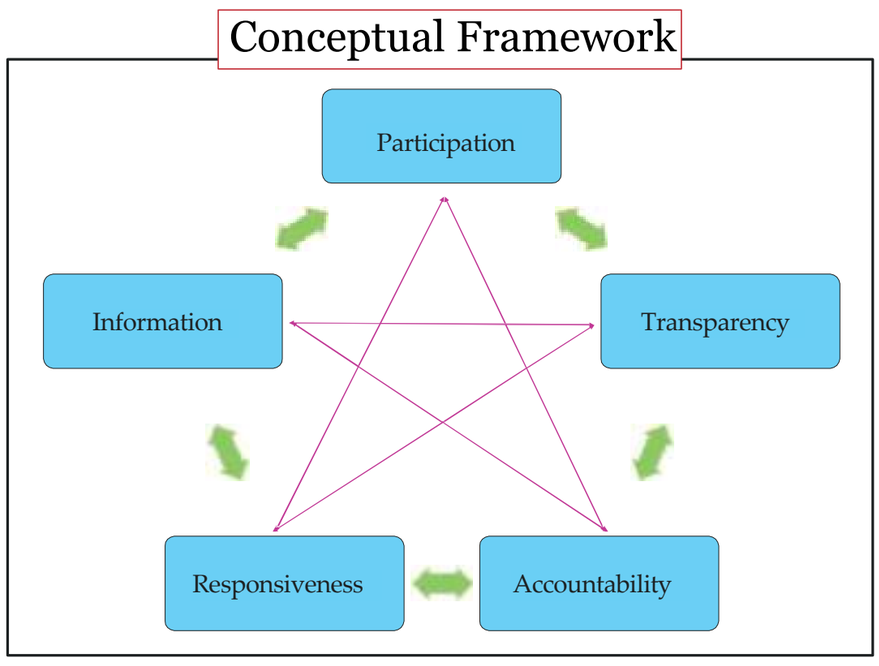
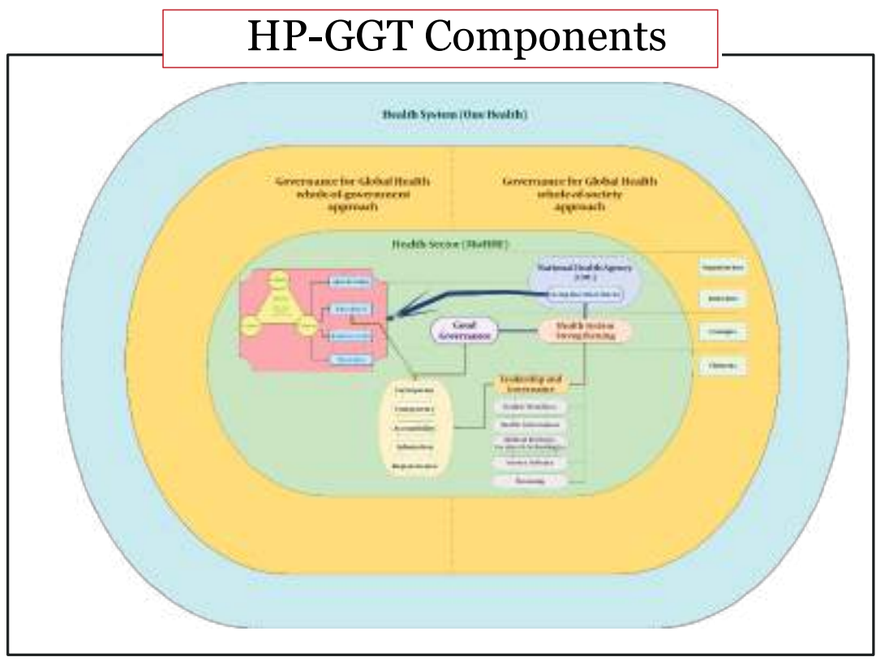
Introduction

- Global health and wellbeing have always been threatened by microbial agents, the risk of which has recently increased due to globalization.
- Countries' emergency preparedness requires an integrated system that can detect, respond to, prevent, and promptly report on microbial threats.
- The need for health system strengthening (HSS) and national public health institutions, including the Center for Disease Control and Prevention (CDC), is now greater than ever.
- The COVID-19 pandemic revealed the insufficient resilience of the CDC and health system surveillance in Iran to respond to health threats efficiently.
- Our aim: to strengthen the CDC and health system surveillance in Iran through the lens of HSS good governance using a Health Policymaking Governance Guidance Tool (HP-GGT).
- HP-GGT: A framework to specifically measure the governance of the health system in low- and middle-income countries.

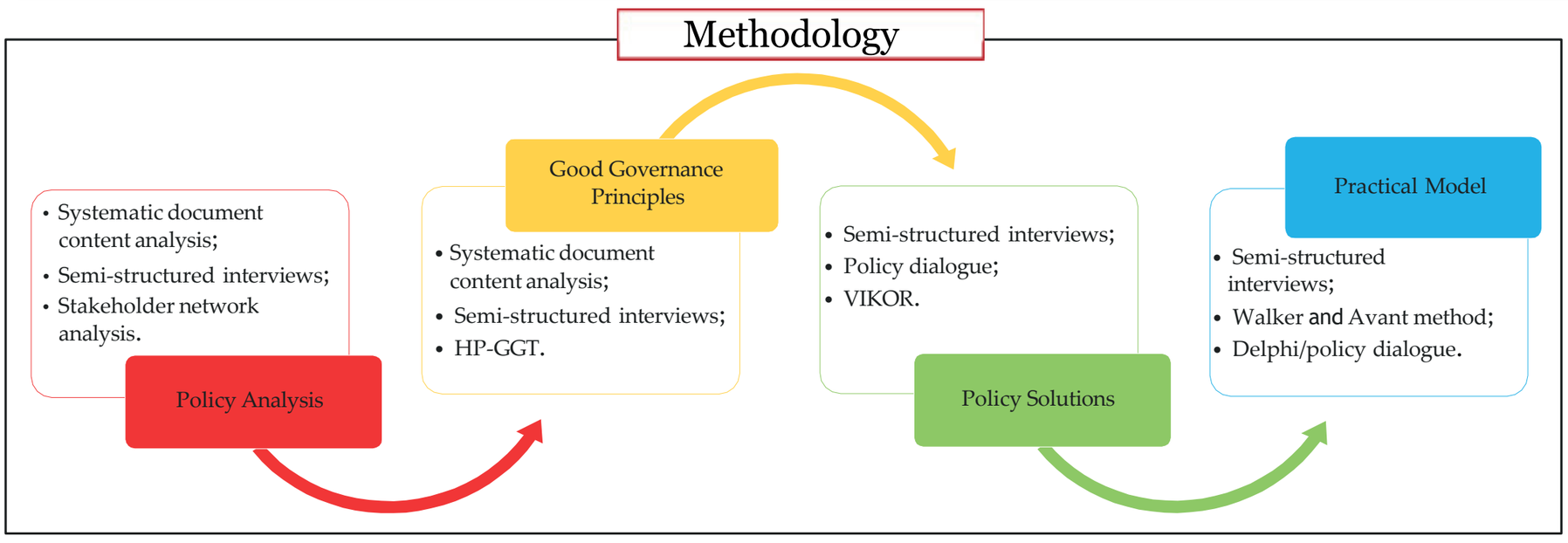
Conceptual Framework



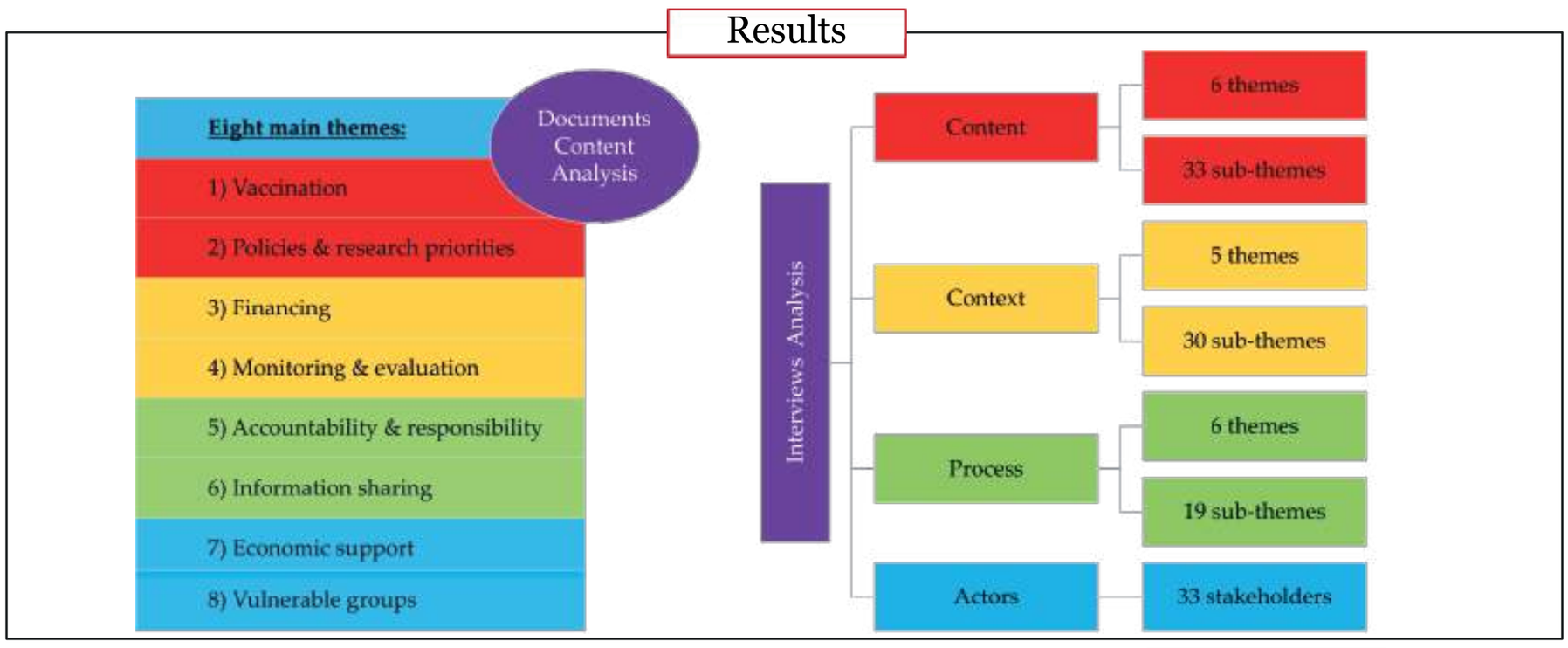
HP-GGT Components



Methodology



Results



Conclusions

- Analyzing HP-GGT components can lead the health system of Iran towards establishing good governance for health system strengthening in the face of microbial threats.
- Our findings might serve as a roadmap to facilitate evidence-based policymaking with a whole-government, whole-society approach, while increasing multi-sectoral collaboration and strengthening the governance of health surveillance system in Iran and similar settings.

Acknowledgements

We would like to express our sincere appreciation to all interviewees and experts who gave us advice to conduct this study.

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Health Promotion for Non-Communicable Disease Prevention in Moldova

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Moldova has made strong commitments to address risk factors for non-communicable diseases. SDC's Healthy Life Project, implemented by the Swiss TPH Institute, is supporting the Ministry of Health and the National Agency for Public Health in Moldova to roll out the health promotion for behavior change through individual empowerment and community engagement for NCDs prevention. Evidence-based health planning, using health profiles, promoting Health in All Policies, and intersectoral collaboration for health promotion have been addressed. The baseline assessments of health promotion practices and perceptions were conducted with different groups of stakeholders. A holistic understanding of Health Promotion concepts was almost absent. There was a general perception that Health Promotion is the responsibility of the health sector. There was no multisectoral coordination for health promotion and limited tools used by health practitioners, low capacity for data management and analysis, and scarce use for decision-making. To improve inter-sectorality, the representatives of Local Public Administrations (mayors, specialists from health, social, educational, cultural, and sports domains), Governmental decentralized services (police, food safety, ecology, emergency, and other services) were trained on WHO "Healthy Communities" and "Health in All Policies" initiatives in collaboration with the Moldovan School of Management in Public Health (more than 400 people).

For capacity building on health promotion of Moldovan specialists in designing, conducting, monitoring, and evaluating health promotion interventions, a practical tool COM-B (Capability, Opportunity, Motivation, and Behaviour change) to help identify the sources of behavior that can be the targets of intervention was developed and institutionalized at the SUMP "Nicolae Testemitanu" for continuing medical education.

Capacity-building of practical specialists, raising awareness of the population, and engagement of Local Public Authorities and local stakeholders increased health promotion interventions for non-communicable disease prevention and control, taking into account the local evidence and context and specific needs of the community.

Health Promotion for Non-Communicable Disease Prevention in Moldova

Authors

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Introduction

Moldova experiences a high NCD burden, and particularly high rates of cardiovascular diseases. In recent years, Moldova has made strong commitments to address risk factors for non- communicable diseases, but during the COVID-19 pandemic, the ability to address NCDs has been impacted. There is a strong need for the strengthening of intersectoral collaboration and community empowerment for health promotion and NCDs prevention.

Methodology

Evidence-based health planning, the use of health profiles, promoting Health in All Policies to strengthen intersectoral collaboration and health promotion for behaviour change approaches have been addressed.

Figure 1. Example health profile of the Causeni district for health promotion.

Results and Discussion

A holistic understanding of Health for Promotion concepts addressing risk factors was close to absent in Moldova. There was a general perception that Health Promotion is the responsibility of the health sector. There was no multisectoral coordination for health promotion and limited tools used by health practitioners, and a low capacity for data management and analysis and scarce use for decision-making.

- To improve the inter-sectorality and functionality of the Territorial Public Health Councils, the representatives of local public administrations (mayors, specialists from health, social, educational, cultural and sports domains) and decentralized governmental services (police, food safety, ecology, emergency and other services) were trained in WHO "Healthy Communities" and "Health in All Policies" initiatives in collaboration with the Moldovan School of Management in Public Health (more than 400 people).
- For capacity building for the health promotion of Moldovan specialists in designing, conducting, monitoring and evaluating health promotion interventions, a practical tool, COM-B (Capability, Opportunity, Motivation and Behaviour change), was used to help identify sources of behaviour that can be the targets of an intervention. It was developed based on districts' health profiles and institutionalized at the SUMP "Nicolae Testemitanu".

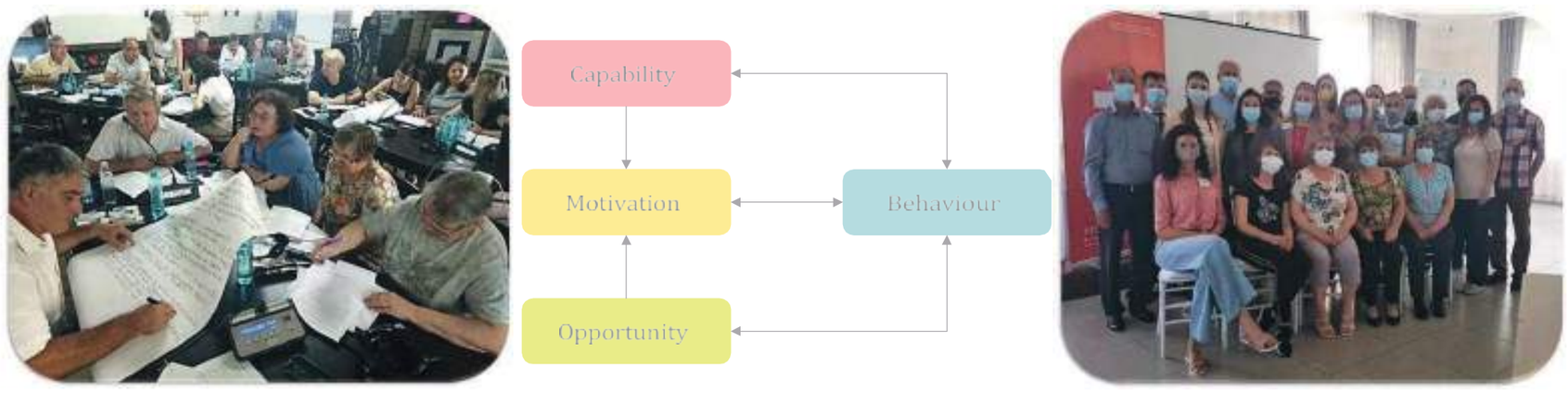

Figure 2. Training on health promotion for behavior change (COM-B Model, Michie et al, 2011; adapted visualization) in Moldova, 2019 (left picture) and 2021 (right picture).

Conclusions

Capacity building of practical specialists; raising awareness of the population and improving intersectorial collaboration by engaging Local Public Authorities and local stakeholders in planning and implementing health promotion interventions, taking into account the local evidence and context and specific needs of the community; increasing local capacity for non- communicable disease prevention and control.

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Retinal Manifestations in Patients with COVID-19: A Prospective Cohort Study

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The recent outbreak of the coronavirus SARS-CoV-2 has been declared a worldwide pandemic. Within various multi-organ involvement, several ocular manifestations have been described, such as conjunctivitis and retinopathy. The prevalence and severity of retinal lesions and their relation to the severity of systemic disease are unknown. We performed a prospective, observational study on 172 consecutively hospitalized patients with acute confirmed COVID–19 infection. All patients underwent screening fundus-wide field photography at the time of hospital admission. Despite no ocular or vision-related symptoms, we found cotton wool spots (CWS) in 19/172 patients (11%). Diabetes history, overweight, and elevated C-reactive protein were more frequently observed among patients with retinal abnormalities, while a history of systemic hypertension was more frequently observed among patients without retinal findings. At the three-month follow-up visit, CWS had subsided in all patients.

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Introduction

- The recent outbreak of the Coronavirus SARS- CoV-2 has been declared a worldwide pandemic.
- Within various multi-organ involvements, alterations of the retina in patients with SARS- CoV-2 have been described.
- The most frequent are cotton wool spots (CWS), reported in several cross-sectional studies. Other manifestations include retinal hemorrhages, dilated veins and tortuous vessels.
- The pathophysiology, incidence and clinical course of these retinal findings as yet remain unclear.

Purpose

The purpose of this study was to perform a systematic screening for retinal alterations among consecutive patients hospitalized for an acute COVID-19 infection requiring supplementation with the presence of retinal abnormalities and to study the longitudinal evolution of the identified lesions.

Methods

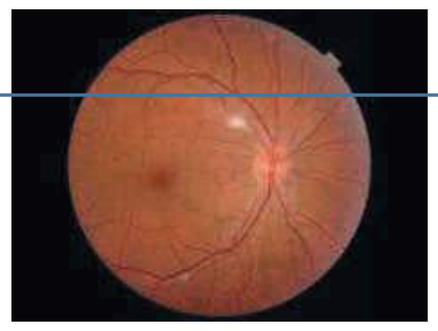
- We performed a prospective, observational study on 172 consecutively hospitalized patients with acute confirmed COVID–19 infection.
- All patients underwent screening fundus wide field photography at the time of hospital admission.
- Vital parameters and biological variables were collected on the day of admission. Concomitant diseases were listed.
- A three-month ophthalmic follow-up was scheduled for patients with retinal lesions.

Results

- Of the 172 examined patients, retinal lesions were found in 19 patients (11%).
- Cotton wool spots alone (CWS) were found in ten patients (6%), hemorrhages alone were found in three patients (2%) and CWS with hemorrhages were found in six patients (3.5%).
- Among these 19 patients, 6 had bilateral presentation (3.5%).

OCT scans showed hyperreflectivity of the inner retinal layers, consistent with CWS (Figure 1,2).

- Three months after screening, there was a complete resolution of clinically evident CWS (Figure 3) with the concomitant normalization of the OCT scan (Figure 4) in all patients. All patients were symptom-free 3 months after screening.
- Diabetes history and obesity were significantly more prevalent among patients with retinal abnormalities.
- Patients with retinal findings presented higher C- reactive protein (CRP) values and potassium levels.



Conclusion

Considering that retinal vasculature can be directly evaluated via fundus examination, the visualization of such lesions could represent signs of vascular involvement in other organs besides the eye. Thus, the above-mentioned comorbidities could be a severe risk factor, not only for the retinal vasculature, but also for the brain and other organs' vasculature.

Acknowledgments: We want to thank the Intermediate Care Unit team of the Geneva University Hospitals for their help during the recruitment process.

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Socio-Economic Determinants of SARS-CoV-2 Infection: Results from a Population-Based Serosurvey in Geneva, Switzerland

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SARS-CoV-2 infection and its health consequences have disproportionally affected disadvantaged socio-economic groups globally. However, most evidence relies on confirmed cases. Serological surveys are useful as they yield more accurate estimations of the real number of infections, including mild and asymptomatic cases. This study aimed to analyze the association between socio-economic conditions and having developed anti-SARS-CoV-2 antibodies in a population-based sample in the canton of Geneva, Switzerland. Data were obtained from a population-based serosurvey of adults in Geneva and their household members, between November and December 2020, towards the end of the second pandemic wave in the canton. We tested participants for anti-SARS-CoV-2 antibodies targeting the spike (S) protein. Socio-economic conditions were self-reported and included occupational position, education, family income, ethnicity, country of birth, household residential area, household density, and the experience of financial hardship. Mixed effects logistic regressions were conducted for each predictor to test its association with the seropositive status as the main outcome. A total of 2,889 adults completed the study questionnaire and were included in the final analysis. Retired participants and those living in suburban areas had lower odds of a seropositive result when compared to employed participants or those living in urban areas, respectively. People facing financial hardship for less than one year had higher odds of a seropositive result compared to those who had never faced financial difficulties. Education, occupation, and income were not associated with seropositive status to SARS-CoV-2, nor were ethnicity or country of birth in the overall study sample. Employment status, the experience of financial hardship, and residential areas were associated with the development of anti-SARS-CoV-2 antibodies following infection during the second wave of the pandemic. Although no association was found with traditional measures of socioeconomic status in our sample, inequalities in SARS-CoV-2 infection were apparent across other socioeconomic conditions, calling for attention to the broader set of determinants of health that may shape a differential distribution of COVID-19 within the population. This is imperative for tailoring public health interventions, such as vaccine prioritization and public health campaigns, and for setting up supportive mechanisms for vulnerable population groups.

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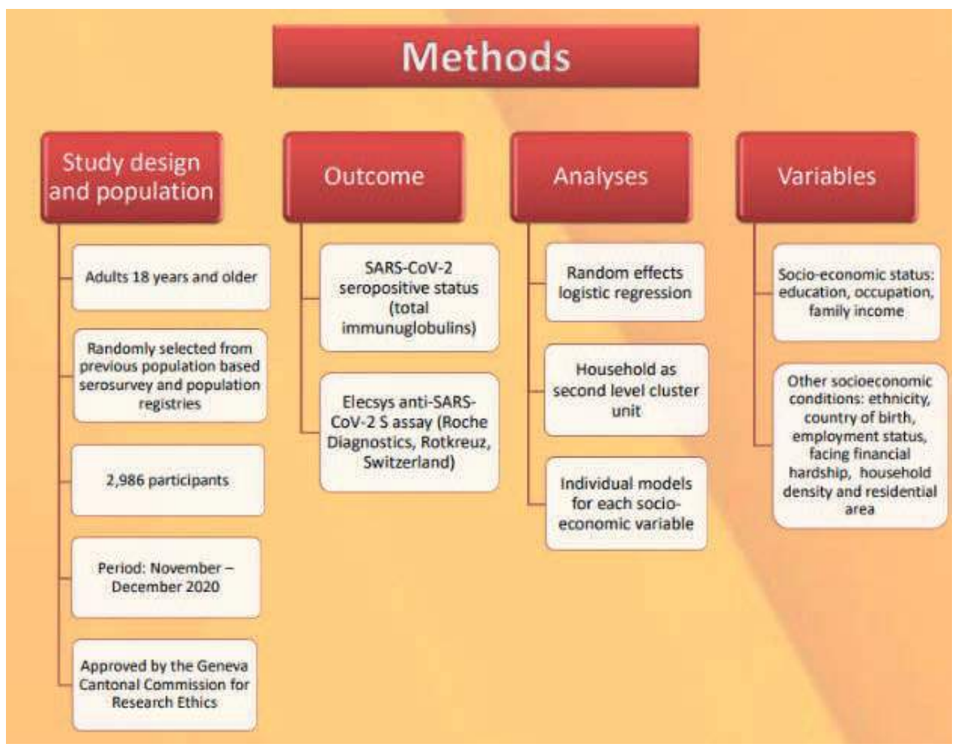
Background

SARS-COV-2 infection and its health-related consequences have disproportionally affected disadvantaged socio-economic groups (1–3). Disadvantaged populations accumulate several vulnerabilities to infection, such as poor living conditions, higher job instability, fewer job opportunities, poorer social benefits and lower financial security (4,5). They are also known to have a higher burden of chronic diseases and reduced access to healthcare (6), both risk factors for COVID-19 severity (7). Several studies revealing social inequalities related to COVID-19 have been based on confirmed RT- PCR test results, therefore missing a large part of the population who did not undergo testing (8,9). A better picture of the distribution of the infection in the population can be achieved with serological surveys (10). Understanding the influence of socioeconomic conditions on the probability of being infected with SARS-CoV-2 is crucial for the implementation of equity-driven public health measures to contain the spread of the virus

Aim: To analyze the association between socio-economic conditions and having developed anti-SARS-CoV-2 antibodies during the second COVID-19 wave in a representative sample of the population in the canton of Geneva.



Conclusions

The COVID-19 pandemic has disproportionately affected socially vulnerable populations globally. However, the impact of socio-economic determinants can vary widely depending on geographical, political and cultural contexts (11–13). In our study, we have found associations of employment status, financial hardship and residential area with the natural development of anti SARS-CoV-2 antibodies during the second wave of the pandemic (before the roll-out of the vaccination campaign in Switzerland), but not with other socioeconomic conditions. Our results highlight the importance of examining the broader social determinants of health when evaluating the differential impact of the pandemic within the population and when setting up public health interventions and supportive mechanisms for vulnerable population groups.

Results

In total, 2,889 participants had a blood sample taken, completed the study questionnaire and were included in the final analysis. Education, occupation and income were not associated with being seropositive in the overall sample (results not shown). Associations were found with employment status, financial hardship and the residential area in the overall sample, with retired people and those living in a suburban area exhibiting lower odds of a seropositive result when compared with those employed and those living in an urban area, respectively. People facing financial hardship for less than a year had twice the odds of a seropositive result when compared to those that had never faced financial difficulties, with all other variables remaining constant. This association did not hold for participants having faced financial difficulties for several years. People living in households with higher density also tended to have higher odds of a seropositive result. Ethnicity and country of birth were not associated with seropositivity in our sample (see table).

OR 2.23

People facing financial hardship in the last year had 2.23 times the odds of a seropositive result compared to those who never faced financial difficulties.

OR 0.42

Retirees had 0.42 times the odds of a seropositive result compared to those employed.

OR 0.67

People living in suburban areas had 0.67 times the odds of a seropositive result compared to those living in urban areas.

Association between socio-economic conditions and seropositive status to SARS-CoV-2

	Age-and sex-adjusted model			Fully adjusted model +		
	OR	(95% CI)	p	OR	(95% CI)	p
Ethnicity						
Caucasian	Ref.	Ref.	.	Ref.	Ref.	.
Other	0.69	[0.42,1.15]	0.154	0.66	[0.39,1.12]	0.123
Country of birth						
Switzerland	Ref.	Ref.	.	Ref.	Ref.	.
Other High income countries	0.99	[0.70,1.40]	0.962	0.93	[0.65,1.34]	0.693
Low and middle income countries	0.81	[0.49,1.34]	0.419	0.72	[0.43,1.23]	0.230
Employment status						
Employed	Ref.	Ref.	.	Ref.	Ref.	.
Independent	1.21	[0.68,2.18]	0.515	1.26	[0.70,2.28]	0.444
Retired	0.46*	[0.23,0.93]	0.030	0.42*	[0.20,0.87]	0.020
Student	0.85	[0.44,1.65]	0.635	0.81	[0.34,1.95]	0.645
Unemployed	1.78	[0.85,3.76]	0.128	1.76	[0.82,3.77]	0.147
Other	0.54	[0.28,1.05]	0.070	0.46*	[0.22,0.93]	0.031
Facing financial hardship						
Never	Ref.	Ref.	.	Ref.	Ref.	.
Yes, not currently but have happened in the past	1.30	[0.92,1.85]	0.138	1.26	[0.88,1.82]	0.196
Yes, for several years	1.62	[0.70,3.70]	0.257	1.65	[0.69,3.93]	0.260
Yes, for less than a year	2.19*	[1.01,4.72]	0.046	2.23*	[1.01,4.95]	0.049
Don't want to answer	0.94	[0.55,1.61]	0.818	0.89	[0.50,1.61]	0.712
Residential area						
Urban	Ref.	Ref.	.	Ref.	Ref.	.
Suburban	0.65*	[0.45,0.94]	0.021	0.67*	[0.46,0.97]	0.036
Rural	0.93	[0.58,1.47]	0.745	0.95	[0.59,1.52]	0.810
Household density						
<2	Ref.	Ref.	.	Ref.	Ref.	.
≥2	1.55	[0.96,2.51]	0.073	1.55	[0.95,2.54]	0.082

*p < 0.05

+ Adjusted for age, sex, traditional measures of socio-economic status (education, occupation and family income) and health related variables (having a chronic disease, weight status, smoking status and blood group)

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SPECCHIO-COVID19 Suivi de la pandémie pour les genevois

HUG Hôpitaux Universitaires Genève

Socio-Economic Impact of the COVID-19 Pandemic on Smallholder Farmers' Households in Bududa District, Uganda

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Bududa district in Eastern Uganda is recovering from recent landslides and the stringent COVID-19 preventive measures, which have exacerbated the economic vulnerability of its communities. We conducted a quantitative assessment of the socio-economic impact of the COVID-19 pandemic on smallholder farmers' households in Bududa District. Through a systematic sampling, in May 2021, we cross-sectionally enrolled households from three conveniently selected villages, Bukalasi, Bushiyi, and Bushika, in Bududa District, Uganda. Pretested standardized semi-structured questionnaires were used to collect data on the social and economic effects of the COVID-19 pandemic on households. Of the 210 participants interviewed, 155 (54.8%) were male, with a median age of 37 (IQR: 29- 51) years. The majority of the participants (153, 72.4%) were married, and 197 (93.8%) were living in rural areas. Most of the participants (90.1%) practiced farming as their primary occupation. Almost all participants 209 (99.5%) were aware of COVID-19. Of the 209 participants, the majority, 188 (90.0%) and 190 (90.9%), received their information from radios and rumors, respectively. The majority of the household, 48 (22.9%), belonged to the "less poor" category of the socio-economic index. Of the 210 households interviewed, 111 (52.9%) reported having sold assets, 106 (50.5%) borrowed money, and 111 (53.4%) used their savings to cope with the financial constraints of the pandemic. A total of 65 (30.9%) of the 210 participants reported a change in treatment from their partners, with worsened emotions, a reduction in finances, and an increase in violence cited as the most common changes. However, 22 (66.7%) of those who reported a change in intimacy recorded increased levels of intimacy. COVID-19 awareness was universal among the study participants. There was a significantly negative socioeconomic impact of the COVID-19 pandemic, leading to the loss of land and farm produce with catastrophic consequences for the households. Strategies to strengthen rehabilitation programs to fasten recovery from the devastating effects of COVID-19 in this community should be prioritized.

Socio-Economic Impact of the COVID-19 Pandemic on Smallholder Farmers' Households in Bududa District, Uganda

Authors

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Background: Bududa district in Eastern Uganda is recovering from recent landslides and the stringent COVID-19 preventive measures, which have exacerbated the economic vulnerability of its communities.

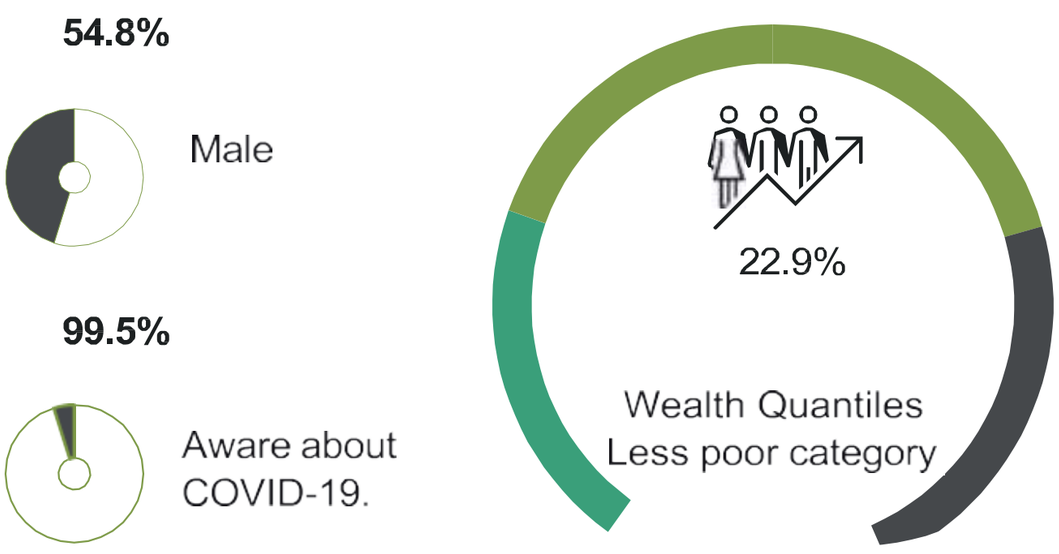
Methods

Through systematic sampling, in May 2021 we cross-sectionally enrolled households from three conveniently selected villages, Bukalasi, Bushiyi, and Bushika, in Bududa District, Uganda.

Pretested standardised semi-structured questionnaires were used to collect data on the social and economic effects of the COVID-19 pandemic on households.

Results

- Median age of 37 (IQR: 29- 51) years;
- 153 (72.4%) were married;
- 197 (93.8%) were living in rural areas;
- 90.1% practised farming as the primary occupation;
- 188 (90.0%) sourced information from radios;
- 190 (90.9%) sourced their information from rumours.



- Overall, 65 (30.9%) of the 210 participants reported a change in treatment from their partners.
- Worsened emotions were the most reported change. Of those who reported a change in intimacy, 22 (66.7%) recorded increased levels of intimacy.

Coping strategies:

52.9% sold their assets | 50.5% borrowed money | 53.4% used savings

Conclusions

- COVID-19 awareness was universal
- Significant negative socioeconomic impact
- Loss of land and farm produce

Recommendation

Strengthen rehabilitation programs to speed up recovery

(CHIP) Digital Health Census, Longitudinal Primary Health Follow-Up, and Disease Surveillance Through a Unified Mobile Platform

Hemant Sharma
Development Lead, Udaipur, India

In a vast country like India, with a 65% rural population, it is difficult to not only track disease spread but also to share health awareness and state-specific guidelines. Screening, testing, contact tracing, and quarantining are especially difficult in areas with low literacy and sociodemographic barriers.

Further, the current data collection system is paper-based, and communication is established as a hierarchy, from the block to the district to the state. This data are shared via Excel sheets, so it remains difficult to obtain information in real-time and take action in a timely manner. Khushi Baby's CHIP platform is not only disrupting this paper-based tracking system but also digitally empowering Community Health Workers (CHWs). It includes a complete authenticated digital health census through door-to-door surveys by CHWs in Rajasthan. The USP of the platform includes:

1. Offline mobile applications for frontline health workers and medical officers linked longitudinally to ensure referral/follow-up completion and monitoring;
2. AI algorithms, built in collaboration with Google AI, identify and predict health worker data diligence;
3. Our AI/GIS-based dashboard allows for the prediction and visualization of COVID-19 clusters and COVID-19 under immunization in the context of non-COVID-19 conditions such as TB, NCDs, and pregnancy;
4. Our automated voice calls supplement health worker efforts by encouraging beneficiaries to complete their referrals, follow-ups and vaccinations.

Post the platform's launch in July 2020, more than 63,000 Community Health Workers used it to screen more than 14 million residents with 94,000 referrals and 31,000+ follow-ups. The Government of India recognized the platform as a finalist in the Strengthening COWIN Grand Challenge in May 2021.

In the last two months since the relaunch, an additional 3 million residents have been enrolled through the digital health census, and had their social determinants of health, reported health conditions, and COVID-19 vaccination status updated through CHIP. Given our ongoing role as the Nodal Technical Support Partner in Rajasthan and the integration of our platforms within the state's health infrastructure, we are well poised to meaningfully continue to contribute to pandemic preparedness in India.

(CHIP) Digital Health Census, Longitudinal Primary Health Follow-Up, and Disease Surveillance Through a Unified Mobile Platform

Authors

Hemant Sharma

Development Lead, Udaipur, India

Problem Statement

India has the world's largest public health workforce, with over 1M ASHAs (village health volunteers) working under India's National 250K ANMs (Auxiliary Nurse Midwives), women in their 20s to 40s, caring for over 900M residents living in rural communities. Time saved from paper-based and fragmented digital reporting could be used to serve over 20M more beneficiaries on a monthly basis, to generate an accurate population denominator, to ensure longitudinal care follow-up, and to identify the community spread of disease easily.

Solution

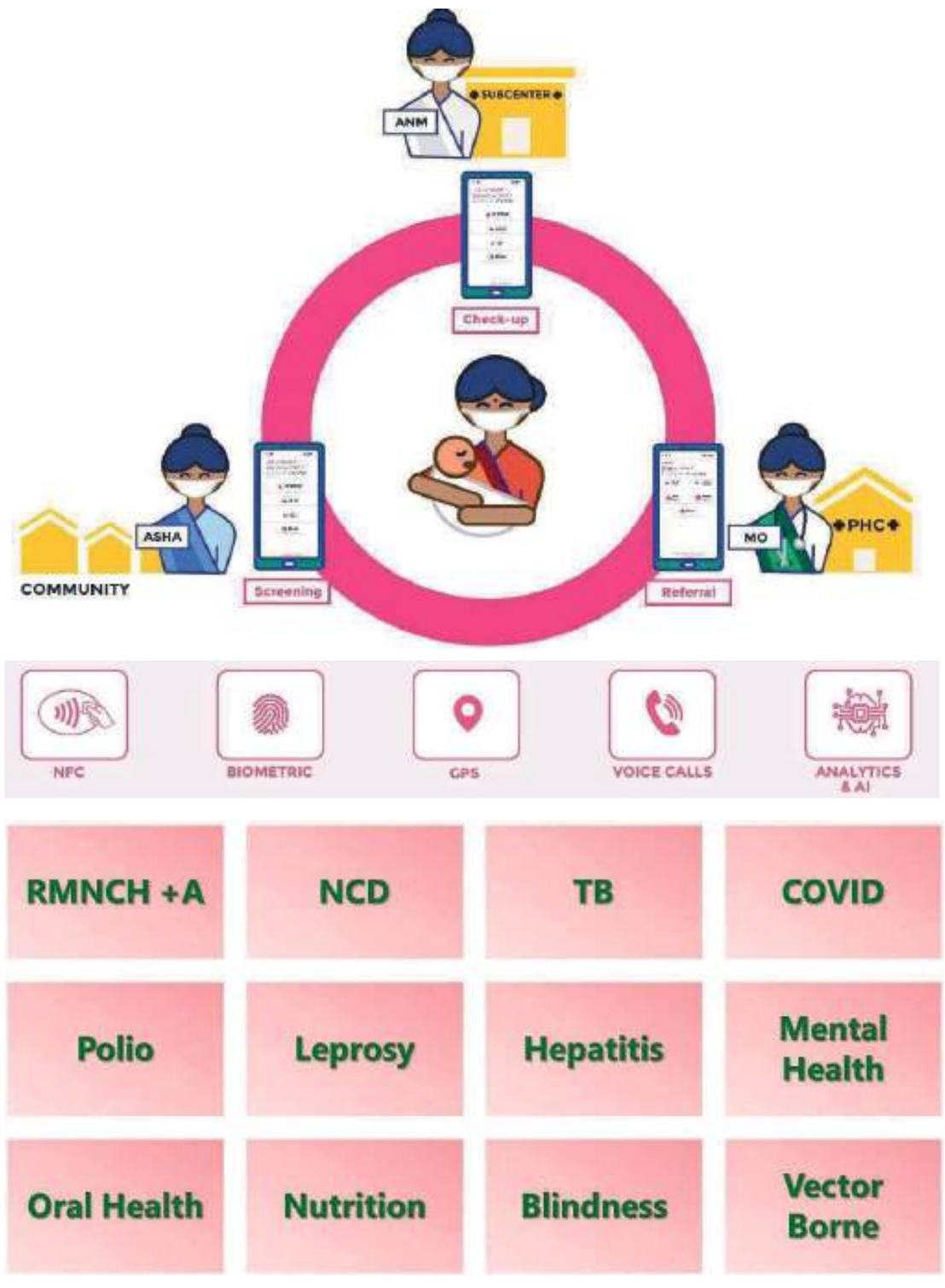
Khushi Baby looks to address the above challenges with CHIP ("Community Health Integrated Platform"), a digital public health system, which is currently being scaled across Rajasthan, India's biggest state.

CHIP includes offine-ready m-health applications for the three key health workers of the Indian public health system: the ASHA (village health volunteers), the ANM (nurse, who visits the community once a month for preventative checkups), and the Medical Officer (who cares for high-risk patients).

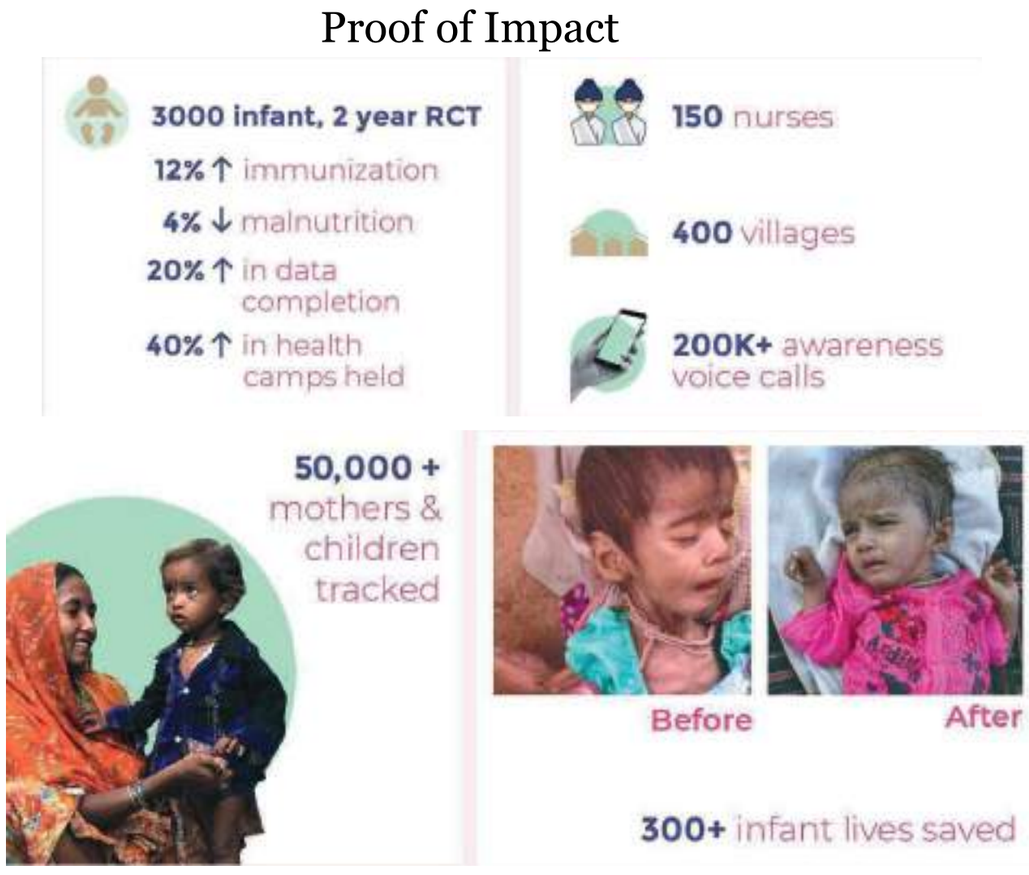
These mobile applications capture the entire work requirement of each respective health worker, across all primary health care programs. This streamlines data collection, report generation, and payment automation. These mobile applications are also inter-linked, allowing longitudinal beneficiary data for informed care to be shared. Using the platform, health workers will be able to perform the following core activities from their smartphone:

1. A digital health census to capture the true population denominator (which has been a challenge) and community health need;
2. Longitudinal follow-up of primary health care across program verticals (e.g., family planning, maternal and child health, non-communicable diseases, tuberculosis);
3. Disease outbreak surveillance for COVID-19 and other emerging infectious diseases (including symptom-screenings, referrals, and vaccination follow-up).

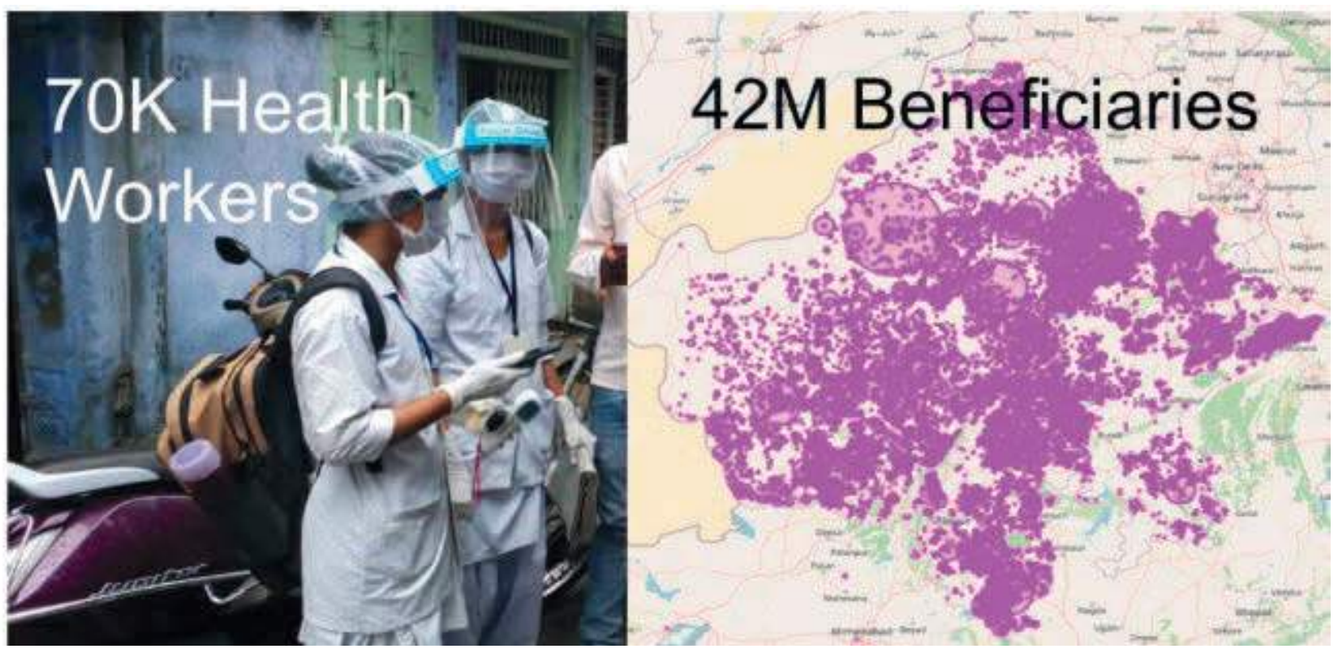
This platform also digitally empowers health officials with AI and GIS-based dashboards to a) monitor and respond to community needs in real time, b) monitor and respond to healthcare performance in real time, and c) automate personalized community engagement for health workers and beneficiaries.



Proof of Impact



Proof of Scale



KhushiBaby

The Role of M-Health, Social Events, and Festivals in Community Health Engagement

Hilderruth Allan Shoo
Mobile Afya, Dar Es Salaam, Tanzania, United Republic of Tanzania

World health systems descending into near collapse during the COVID-19 pandemic have been an eye-opener to global and environmental health stakeholders. It has prompted many discussions featuring experts from different disciplines on how to combat this major health setback, from a change in moral codes, cultural taboos, and beliefs, and using alternative medicine to fight against this deadly pandemic. We believe that the world is a better place when the earth is conserved and furthermore improved to better support our natural resources and life in general. The color green, as it can be seen as our company's theme, encompasses the goals and vision of "Reinventing Global Health in Times of Global Challenges" as it represents life and a healthier Africa. The initiatives we have undertaken cut across different fields of knowledge, from tech to the health sector.

- Through our internet-free mobile app, we subscribe users who then obtain access to health information and communicate directly with us;
- Through organizing and undertaking health outreach services to remote areas in order to increase awareness, especially on COVID-19.

Mobile Afya is the first USSD application in Africa using internet-free mobile technology to provide basic health information and education in local and native languages, starting with Swahili in Tanzania, East Africa. The app is developed by healthcare professionals, medical doctors, and public health specialists with the support of engineers and tech innovators. We have subscribed 12,000 Mobile Afya users who come from more than 10 regions in Tanzania. We receive an average of 1,000 requests per day, and we have had 346,330 total sessions so far. Mobile Afya has organized several outreach services and participated in public health fairs, engaging directly with our users and offering free basic health services offering blood pressure, blood glucose, body mass index checkups, eye checkup, and blood donation. The provision of evidence-based knowledge and awareness while involving the communities directly has proven to be effective in preventing diseases and allowing people to make informed decisions. This has empowered the society to take action to improve its health status.

The Role of M-Health, Social Events, and Festivals in Community Health Engagement

Authors

Hilderruth Allan Shoo

Mobile Afya, Dar Es Salaam, Tanzania, United Republic of Tanzania

Introduction

The descent of world health systems into near collapse during the COVID-19 pandemic has been an eye opener for global and environmental health stakeholders. It has prompted many discussions featuring experts from different disciplines on how to combat this major health setback, from a change in moral codes, cultural taboos, and beliefs to the use of alternative medicine to fight against this deadly pandemic.

We believe that the world is a better place when the Earth is conserved and furthermore improved to better support our natural resources and life in general. The color green encompasses the goals and visions towards “Reinventing Global Health in times of Global Changes”, as it represents life and a healthier Africa. This is why it can be seen in our company's theme.

Methodology

The initiatives we have undertaken cut across different fields of knowledge, from tech to the health sector.

Conclusions

The provision of evidence-based knowledge and awareness while involving communities directly has proven to be effective in preventing diseases and allowing people to make informed decisions. This has empowered the community to take action to improve its health status.

Results and Discussion

Mobile Afya is the first USSD application in Africa using internet-free mobile technology to provide basic health information and education in local and native languages, starting with Swahili in Tanzania, East Africa. The app has been developed by healthcare professionals, medical doctors and public health specialists with the support of engineers and tech innovators.

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Initiatives

- Through our internet-free mobile app, we subscribed users who then received access to health information and direct communication with us.
- We organized and undertook health outreach services in remote areas in order to increase awareness, especially of COVID-19.

A Molecular Evaluation of Carbapenem-Resistant Enterobacteriaceae Epidemics in Aquatic Ecosystems across Diverse Geographical Locations and Climatic Conditions during/post the COVID-19 Pandemic

Periyasamy Sivalingam[1], Amandine Laffite[2], Crispin K. Mulaji[3], and John Poté[2]
[1] Water Research Institute, National Research Council of Italy (CNR-IRSA), MEG - Molecular Ecology Group, Largo Tonolli 50, 28922, Verbania, Italy
[2] Department F.-A. Forel for Environmental and Aquatic Sciences and Institute of Environmental Sciences, Faculty of Science, University of Geneva, Uni Carl Vogt, 66 Boulevard Carl-Vogt, CH-1211 Geneva 4, Switzerland
[3] University of Kinshasa (UNIKIN), Faculty of Science, Department of Chemistry, B.P. 190, Kinshasa XI, Democratic Republic of the Congo

During this time of global concern due to different epidemics and climate change, research and actions are essential for the prevention and eradication of diseases affecting human health. Before the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), which causes COVID-19 disease, one of the greatest concerns was the infections caused by multidrug-resistant gram-negative bacteria (MDR-GNB), which are increasingly being reported worldwide. The COVID-19 pandemic, on the other hand, is causing the world to consume more antibiotics, which may result in the emergence of MDR-GNB, a grave and major global health threat. It is alarming in developing countries such as Sub- Saharan Africa and South Asia, where the population is self-medicating using antibiotics to treat symptoms and prevent COVID-19 eventually. Consequently, there is, in fact, the increasing dissemination and emergence of antimicrobial resistance (AMR). In this context, this research explores the prevalence of MDR-GNB harboring carbapenemase in clinical settings and their dissemination into the aquatic ecosystems according to the climatic conditions (temperate/tropical) and COVID-19 pandemic evolution. We aim to build a strong network of stakeholders and scientists with environmental and medical sciences backgrounds in selected countries (Switzerland, DR Congo, and India) to reinforce educational and sensibilization aspects for preventing the COVID-19 epidemic with respect to AMR epidemiology. Quantitative data from hospital and environmental settings will be useful to evaluate the potential human risks and limit the spread of MDR-GNB clinical and environmental settings during and after post COVID-19 pandemic.

A Molecular Evaluation of Carbapenem-Resistant Enterobacteriaceae Epidemics in Aquatic Ecosystems across Diverse Geographical Locations and Climatic Conditions during/post the COVID-19 Pandemic

Authors

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Background: During this time of global concern due to different epidemics and climate change, research and actions are essential to the prevention and eradication of diseases affecting human health. Before the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), which causes COVID-19 disease, one of the greatest concerns was the infections caused by multidrug-resistant Gram-negative bacteria (MDR-GNB) which are increasingly being reported worldwide. The COVID-19 pandemic, on the other hand, is causing the world to consume more antibiotics, which may result in the emergence of MDR-GNB, a grave and major global health threat. It is alarming in developing countries such as in Sub-Saharan Africa and South Asia, where the population self-medicates using antibiotics to treat symptoms and prevent COVID-19. Consequently, there is, in fact, increasing dissemination and emergence of antimicrobial resistance (AMR). In this context, this research explores the prevalence of MDR- GNB harbouring carbapenemase in clinical settings and their dissemination into the aquatic ecosystems according to the climatic conditions (temperate/tropical) and COVID-19 pandemic evolution.

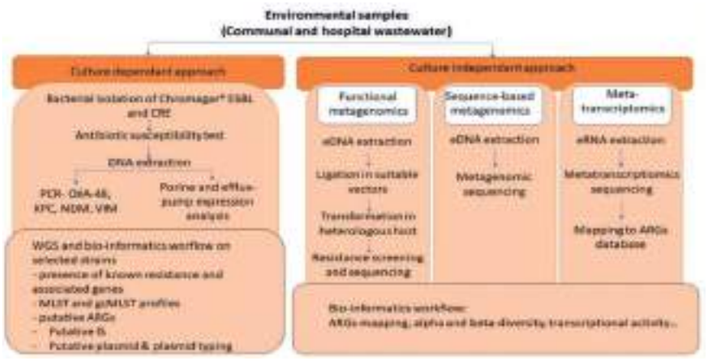
How do urban and hospital effluents affect emerging contaminant spread in river settings?

This research (i) explores the prevalence of MDR-GNB harbouring carbapenemases (KPC, NDM, and OXA-48-like) in the hospital (HUG) and communal effluents, wastewater treatment plants (WWTP) and their dissemination in to the aquatic ecosystems, (ii) characterizes their phenotypic and genotypic resistance patterns to antibiotics that are routinely used in treatment and prophylaxis, (iii) provides insight on antibiotic residue, antibiotic resistance genes, mobile genetic elements (MGEs) and pathogens discharged into the aquatic ecosystems, and (iv) assesses the clonal relatedness of MDR-GNB and MGEs isolated from the same species over the period of time.

We also aim to build a strong network of stakeholders and scientists with environmental and medical sciences backgrounds in the studied countries (Switzerland and RD Congo). This project integrates both clinical and environmental settings to describe the epidemiology of MDR-GNB to give novel insights on significant carbapenem-resistant GNB according to the climatic conditions (temperate/tropical) and the degree of development of countries (developed/developing countries).

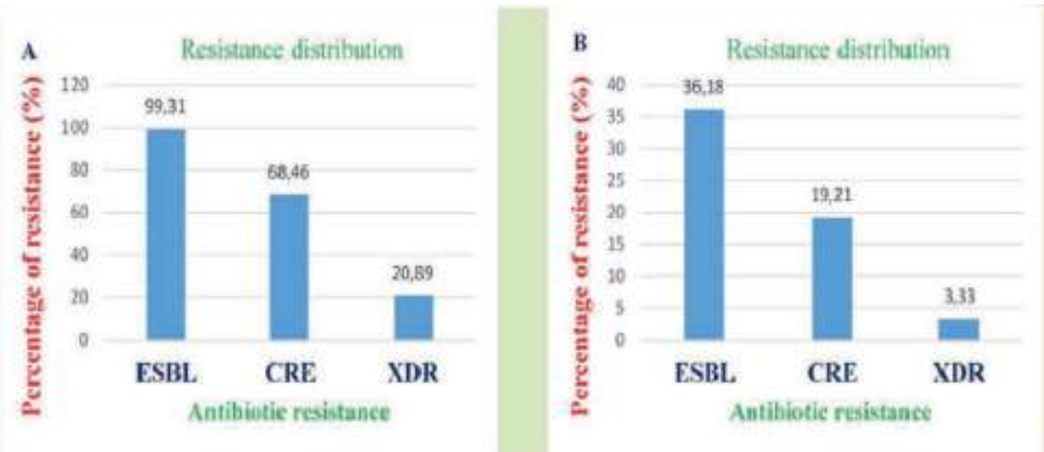
Study Site – Materials and Methods

Sampling of hospital and communal effluents in Geneva, Switzerland.



Target genes	Primer	Sequences (5'-3')	Ammplicon length (bp)	Tm (°C)	Reference
bla_{KPC}	blaKPC F blaKPC R	CGT CTA GTT CTG CTG TCT TG CTT GTC ATC CTT GTT AGG CG	798	60	Ellington et a
bla_{NDM-1}	blaNDM-1 F blaNDM-1R	GGT TTG GCG ATC TGG TTT TC CGG AAT GGC TCA TCA CGA TC	621	60	Ellington et a 2007 Poirel e 2011
bla_{OXA-48}	bla OXA 48 F bla OXA 48 R	GCG TGG TTA AGG ATG AAC AC CAT CAA GTT CAA CCC AAC CG	438	58	Poirel et al.,
bla_{VIM}	blaVIM F blaVIM R	GAT GGT GTT TGG TCG CAT A CGA ATG CGC AGC ACC AG	390	58	Poirel et al.,

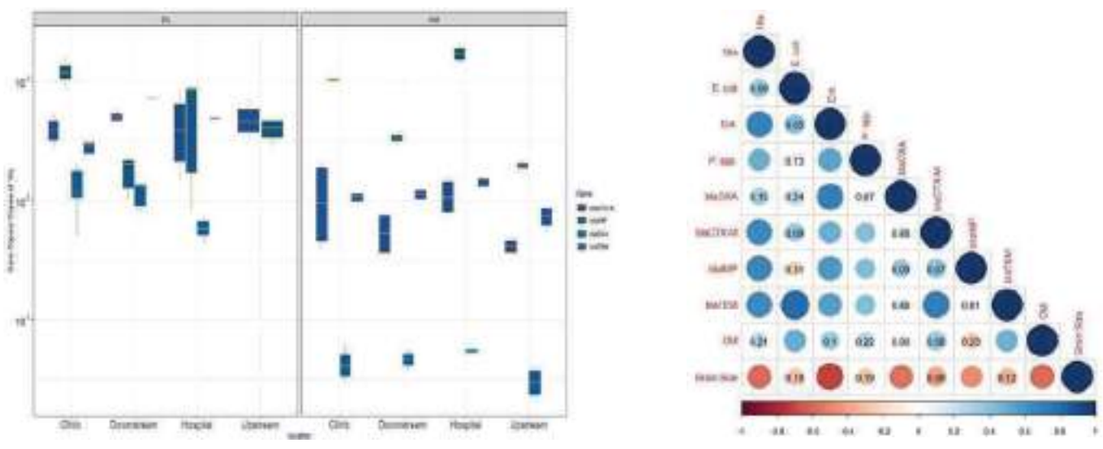
Results part 1: Prevalence of ESBL, CRE and XDR in Geneva effluent (A. before treatment and B. after treatment).



Results part 2: Isolates carrying carbapenemase genes identified before the COVID-19 pandemic (in 2018) from Geneva hospital effluents (HUG) , communal, WWTP and river water samples.

Location	sampling	No of isolates tested	No. (%) with organisms carrying carbapenemases	*E.coli*	*Psedomonas* spp	Other Enterobacteriaceae (Includi *Klebsiella pneumoniae*)
HUG	20.12.2017	35	7 (20)	1	1	5
HUG	17.01.2018	30	8 (26)	1	2	5
HUG	14.02.2018	39	13 (33)	2	4	7
WWTP(Inlet)	4.09.2017	30	3 (10)	2	0	1
WWTP (out)	4.09.2017	23	1 (4.3)	1	0	0
WWTP(Inlet)	18.10.2017	30	1 (3.3)	0	0	1
WWTP (out)	18.10.2017	25	0	0	0	0
WWTP(Inlet)	15.11.2017	30	1 (3.3)	0	0	1
WWTP (out)	15.11.2017	20	0	0	0	0
River	26.10.2017	17	1 (5)	0	0	1
River	15.11.2017	25	1 (4)	0	1	0
Communal	05.10.2017	40	5 (12.5)	1	1	3
Communal	20.11.2017	38	3 (7.89)	1	0	2
Communal	18.12.2017	40	2 (5)	1	0	1

Results part 3: Isolates carrying carbapenemase genes identified before and after the COVID-19 pandemic in Congo hospital effluents and sediments from river receiving systems.



Conclusions

Hospital and urban effluents are considered to be the main sources of Pathogen multiresistances, MDR-GNB-harbouring carbapenemases (KPC, NDM, and OXA-48) and ARGs (bla_{CTX-M} and bla_{SHV}), showing carbapenem resistance (bla_{VIM}, bla_{IMP}, bla_{KPC}, bla_{OXA-48} and bla_{NDM}) dissemination in aquatic environment under tropical and temperate climatic conditions before and post COVID-19. Our ongoing preliminary results indicate that the COVID-19 pandemic didn't have any effects on the environmental dissemination of pathogens, ARBs and ARGs in developing countries under tropical conditions. Our ongoing study is being performed to quantify and correlate the SARS-CoV-2 virus with ARBs and ARGs in Geneva hospital effluents (HUG), communal, WWTP and river water samples after the COVID-19 pandemic.

Reference: https://www.unige.ch/mbiolenv/en/publications

FNSNF Fonds national suisse Schweizerischer Nationalfonds Fondo nazionale svizzero Swiss National Science Foundation

UNIVERSITÉ DE GENÈVE

UK Public Health Rapid Support Team: What Does It Take to Be Ready to Deploy within 48 Hours?

Katie Carmichael, Gina Chen, Benedict Gannon, Susan Ismaeel, and Daniel Stewart
UK Public Health Rapid Support Team, UK Health Security Agency

The UK Public Health Rapid Support Team (UK-PHRST) is an innovative government-academic partnership co-led by the UK Health Security Agency and the London School of Hygiene and Tropical Medicine. The UK-PHRST's triple mandate incorporates outbreak response, research, and capacity development. Since they were formed in 2016, the UK-PHRST has undertaken more than 23 deployments in 15 different countries. We have completed 28 operational research projects, with a further 12 in progress. This presentation describes the processes, equipment, and systems that enable the UK-PHRST to respond internationally to outbreaks within 48 hours. It will share lessons learned in the recruitment, onboarding, and training of staff and the team's pre-departure processes and systems. It will also describe the support provided in the field and post-deployment processes, both of which feed into the UK-PHRST's capacity for rapid response. The UK-PHRST will present a qualitative summary describing what is needed to rapidly deploy UK-PHRST staff across the globe. Across the five years since they were formed, the UK-PHRST have developed a robust approach to ensuring they remain 'deployment ready' within 48 hours.

1. Rigorous and transparent recruitment and training processes ensure the UK-PHRST has access to deployable candidates with the appropriate technical skills and experience;
2. 'Off the shelf' logistics checklists for all travel requirements support rapid deployments;
3. Prior to departure, staff are briefed and aware of expectations on and off the field. Engaging in- country partners in this process is crucial to success;
4. Support services, including technical support and care for both physical and mental health needs, ensure staff are well cared for in the field;
5. Continual assessment and feedback on deployments and processes that support them allow us to remain agile and continually improve how we deploy.

The UK-PHRST has developed a robust set of processes and systems to ensure they are able to deploy a high-quality outbreak response internationally within 48 hours. The lessons learned set out in this presentation provide a unique learning opportunity for partners looking to set up similar rapid- response teams as part of their efforts to strengthen global health security.

UK Public Health Rapid Support Team: What Does It Take to Be Ready to Deploy within 48 Hours?

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UK Public Health Rapid Support Team, UK Health Security Agency

Introduction to the UK Public Health Rapid Support Team

The UK-PHRST is an innovative government-academic partnership funded with UK Aid from the Department of Health and Social Care (DHSC) and co-led by UK Health Security Agency (UKHSA) and the London School of Hygiene & Tropical Medicine (LSHTM), with a consortium of academic partners.

The team has a novel integrated triple-remit of outbreak response, research and capacity strengthening to prevent and control epidemics of infectious diseases in countries eligible for Official Development Assistance (ODA). The team has deployed 26 times to 17 countries between April 2017 and March 2022.

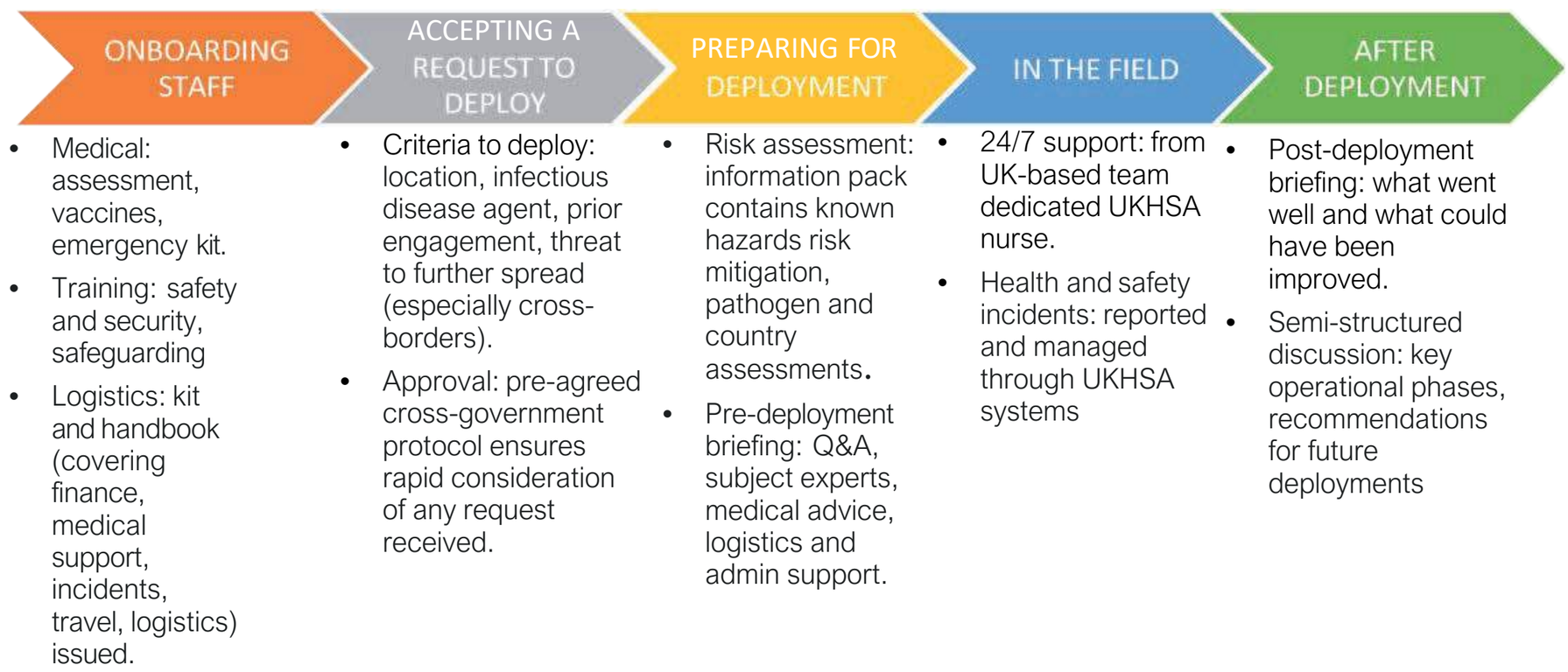
The UK-PHRST has the following objectives:

a. Support partners in low- and middle income countries (LMICs) to investigate and respond to disease outbreaks rapidly at source.
b. Identify research gaps and deliver rigorous research with partners that improves the evidence base for best practice in disease outbreak prevention, detection, and response in LMICs.
c. Develop in-country capacity for an improved and rapid national response to disease outbreaks.

What does it take to create a 'deployment ready' team?

1. Establish the objectives of any deployable group and conduct a systematic benchmarking exercise of similar organisations to gain insight into existing practices.
2. Ensure rigorous and transparent recruitment processes are in place to identify candidates with appropriate technical skills and experience.
3. Consider medical requirements and approval processes so staff are cleared for overseas deployments and given the support they require in advance.
4. Build strong support services for staff to access while in the field, which include mental health considerations as well as physical and technical support.
5. Develop 'off the shelf' logistics checklists for supporting all travel requirements.
6. Pre-prepare as much information as possible so staff can be aware of expectations on and off the field.
7. Engage partners and in-country colleagues in developing deployment-related processes.
8. Establish a feedback system at the outset to ensure the continual evaluation of process.
9. Listen, learn and respond to all feedback given on activities.
10. Continually assess and remain agile for changes to how deployable expertise can be delivered.

Pre-departure, in the field, and post deployment processes



EmpowermentRemote: A Pilot Project on Video-Based Group Psychotherapy for Refugees

Michael Strupf[1], Maren Wiechers[1], Andreas Hoell[2], Johanna Schneider[1], Max Burger[1], Peter Falkai[1], Malek Bajbouj[3], Aline Übleis[1], and Frank Padberg[1]

[1] Department of Psychiatry and Psychotherapy, University Hospital LMU Munich, Munich, Germany
[2] Department of Psychiatry and Psychotherapy, Central Institute for Mental Health, Mannheim, Germany
[3] Department of Psychiatry and Psychotherapy, Charité – Universitätsmedizin, Campus Benjamin Franklin, Berlin, Germany

Refugees commonly report high levels of mental distress upon arrival in Western countries of asylum. The urgent need for psychosocial care in refugee populations remains widely uncovered due to the scarcity of culture-sensitive treatment, multiple barriers to accessing healthcare services, and, most recently, the COVID-19 pandemic. Western healthcare systems are in charge of providing low- threshold accessible mental health interventions that are specifically tailored toward the needs of refugees in the post-migration setting. Here, we present an innovative video-based group therapy for refugees with affective disorders named *EmpowermentRemote*. The intervention relies on the evidence- based therapy manual Empowerment, which has been shown to be effective and cost-efficient in a multicenter trial. In *EmpowermentRemote* groups, we aim to apply the intervention in a video-assisted setting by reaching out to refugee patients via tablet or smartphone. Refugees are equipped with the knowledge and skills to cope with depressive symptoms and stressors of the post-migration environment. To ensure culture-sensitive treatment, *EmpowermentRemote* groups are supported by professional language mediators, and Western concepts of psychotherapy are culturally adapted.

Video-based group psychotherapy bears great potential as we can treat a larger number of refugees at lower costs and independent of location or service hours, involve translators of diverse languages, and reduce the risk of SARS-CoV-2 infections. Preliminary data indicated that *EmpowermentRemote* is feasible. We aim to investigate the effectiveness of *EmpowermentRemote* in a multicenter trial and implement the intervention in our routine healthcare structure to provide culture-sensitive treatment for refugees in times of the COVID-19 pandemic.

EmpowermentRemote: A Pilot Project on Video-Based Group Psychotherapy for Refugees

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[2] Department of Psychiatry and Psychotherapy, Central Institute for Mental Health, Mannheim, Germany
[3] Department of Psychiatry and Psychotherapy, Charité – Universitätsmedizin, Campus Benjamin Franklin, Berlin, Germany

Background

- Pooled prevalence rates were estimated at 31.5% for PTSD and 31.5% for depression among refugees and asylum seekers (Blackmore et al., 2020). Compared to general populations, these rates were considerably increased and appeared to be persistent for many years after forced displacement.
- As a consequence, there is an urgent need for effective mental health care in refugee populations. However, the scarcity of culture-sensitive treatment options and multiple access barriers to health care for minority groups in Western countries of asylum result in a treatment gap for refugees (Satinsky et al., 2019).
- Western health care systems are responsible for providing low- threshold, accessible mental health interventions that are specifically tailored towards the needs of refugees in the post-migration setting. Internet-based interventions could contribute to overcome access barriers and decrease the burden of disease displaced populations.
- Here, we present a video-based group psychotherapy program named EmpowermentRemote for refugees with depressive and stress-related symptoms.

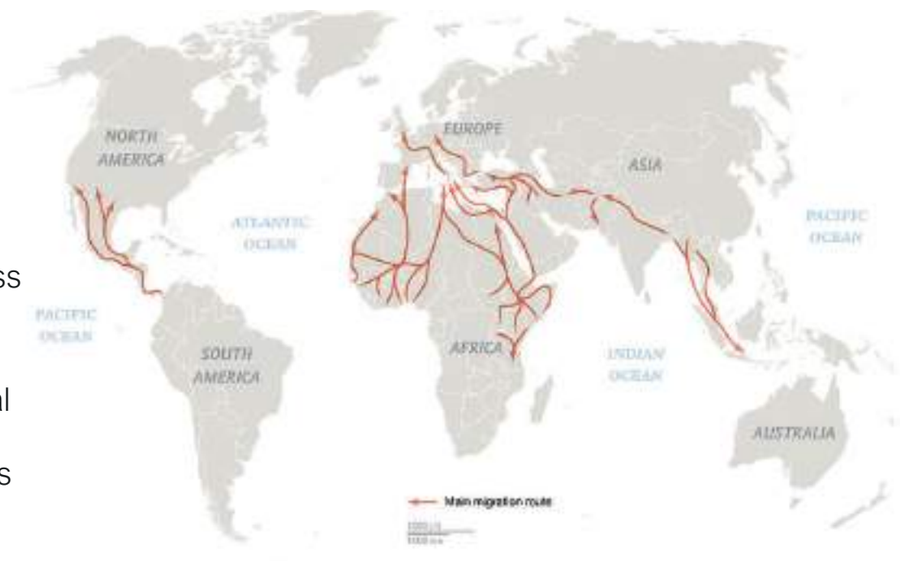

Figure 1. Main migration routes across the globe. Source: UNHCR. Retrieved from https://news.national-geographic.com

Methods and Results

- EmpowermentRemote is based on the evidence-based therapy manual Empowerment (Wiechers et al., 2019), which has been shown to be effective and cost-efficient in a multicenter clinical trial. Refugees are equipped with knowledge and skills to cope with depressive symptoms and stressors of the post-migration environment (see Figure 3). Treatment is culturally adapted and provided under the support of a professional language mediator.
- In EmpowermentRemote groups, we aim to apply the intervention in a video-based setting by reaching out to refugees via tablet or smartphone. Compared to conventional face-to-face group therapy, this allows us to provide treatment to a larger number of patients and reach out to less accessible areas (see Figure 2). Major advantages are higher flexibility, independence of location, translator coverage of less frequently encountered languages, and lower travel costs and time.
- A video-based pilot group with four participants indicated the feasibility of the concept. Depressive symptoms (PHQ-9), general stress-related symptoms (RHS-15), and trauma symptoms (HTQ) were assessed. Descriptive statistics showed a reduction in symptoms of distress and PTSD, but not depression. If only participants with a stable internet connection and regular participation were considered (n=3), symptom reduction was found on all three scales.

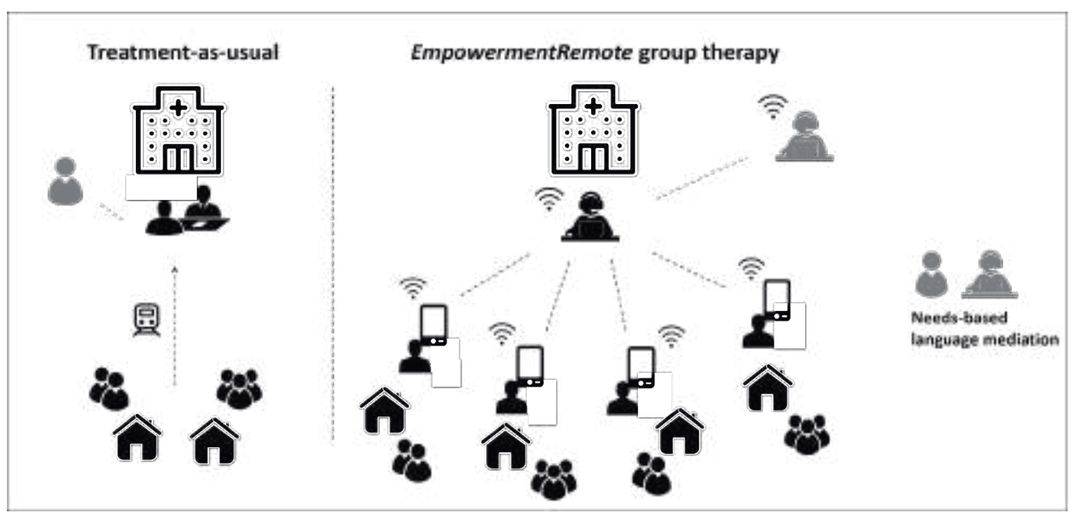

Figure 2. Care model of the EmpowermentRemote group therapy vs. Treatment-as-usual

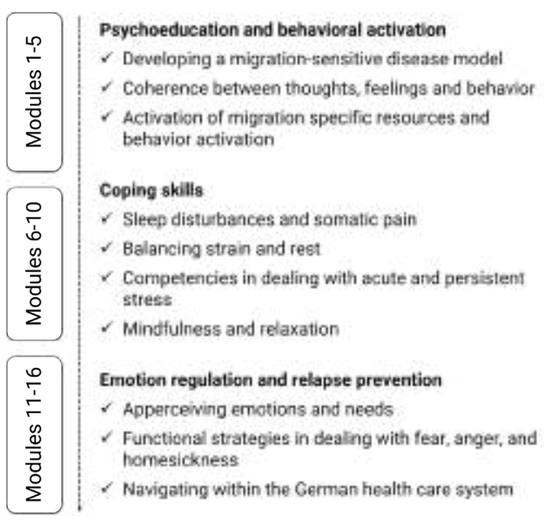

Figure 3. Content overview of the EmpowermentRemote intervention

Discussion

- Video-based group psychotherapy bears great potential as we can treat a larger number of refugees at lower costs and independent of location or service hours, involve translators of diverse languages, and reduce the risk of SARS-CoV-2 infections in times of the COVID-19 pandemic.
- In a pilot study with four participants, EmpowermentRemote was shown to be feasible and well-accepted by participants. A stable internet connection and regular group participation appeared to be pre-requisites of a successful implementation in terms of symptom reductions.
- Therefore, we aim to investigate the effectiveness and cost-effectiveness of EmpowermentRemote in a multicenter randomized controlled trial (preliminary title: Internet-based Empowerment Group Therapy for Refugees and Asylum-Seekers with Common Mental Disorders— INTEGRA), and implement the intervention in our routine health care structure to provide culture-sensitive treatment for refugees in times of the COVID-19 pandemic and ongoing worldwide conflicts causing persistent forced dislacement.

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Acknowledgements

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Analysis of the Legal Feasibility of Cooperative Pharmacies in Africa: The Cases of Cameroon and Kenya

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In all African countries, there are laws governing companies and societies, as well as laws related to the pharmaceutical sector. For this purpose, one or more trained pharmacists may decide to practice the profession on a private basis for the retail distribution of medicines. While some countries allow pharmacists access to all existing corporate forms, others have set limits within the provisions of the pharmacy laws. As a result, in Cameroon, pharmaceutical activity is not allowed under the cooperative society form, even though the law governing cooperative societies states that they may engage in activities in all sectors of human life, including the pharmaceutical sector. More concretely, the Cameroonian Pharmaceutical Act allows only two forms of business corporations (a general partnership or a limited liability company), excluding cooperative societies. In Kenya, on the other hand, the legislator seems more flexible and leaves the choice of the legal form of business for the distribution of medicines to pharmacists, including the cooperative society form. An analysis of the potential of cooperatives suggests that access to quality, low-cost medicines can be more easily achieved in Kenya than in Cameroon since the former country can rely on the cooperative tool.

This assumption (hypothesis) will be discussed throughout the paper.

Analysis of the Legal Feasibility of Cooperative Pharmacies in Africa: The Cases of Cameroon and Kenya

Authors

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Introduction

In Cameroon, cooperatives are governed by the OHADA Uniform Act related to Cooperative Societies (AUSCOOP). This is an Act applicable in 17 states, located mainly in Central and West Africa. Article 5 of the Act states that cooperatives may engage in activities in all sectors of human life.

In Kenya, cooperatives are governed by the Cooperative Societies Act 2005, revised in 2012. Unlike the AUSCOOP, the Kenyan Cooperative Societies Act is silent regarding the spectrum of cooperative activities. In practice, cooperative societies venture into other forms of the business sector.

In Cameroon and Kenya, cooperative laws are general and must be coupled with sectoral laws. More concretely, a cooperative pharmacy must apply two sets of rules; on the one hand, the rules of cooperative law and, on the other, the rules related to the pharmacy sector.

In Cameroon, the pharmacy business is regulated by Law no. 90- 035 of 10 August 1990 on the practice and organization of the profession of pharmacist (1990 Pharmacy Act). In Kenya, it is the Pharmacy and Poisons Act of 1989, revised in 2012.

Methods

To achieve our goal, we used a combination of analytical and exegetical methods.

Results

The Pharmacy Act distinguishes, among other things, between pharmacy sales and wholesales. Regarding pharmacy sale, Section 33 (2) of the Cameroon Pharmacy Act provides that:

"(2) Pharmacists may be authorized to form between them either a general partnership or a limited liability company with a view to operating a pharmacy, provided that such a company owns only one pharmacy regardless of the number of pharmacists associated and that the management of the pharmacy is ensured by one of them. The authority referred to in this paragraph shall be granted under the conditions laid down by regulations".

As for wholesales, Section 57 (2) of the same Act provides that "Wholesale and wholesale distribution establishments may be incorporated either as a general partnership or as a limited liability company formed between pharmacists".

It is clear from these provisions that the cooperative form is excluded. The law refers to two legal forms of organization, thus excluding the cooperative form.

A ministerial order was issued in 2017 to supplement the Pharmacy Act and relates to the conditions for granting approvals to Pharmaceutical Wholesale Distribution Companies. Its Article 2(1) provides that "Wholesale distribution companies of pharmaceutical products must be constituted between pharmacists: either in the form of General Partnerships, or in Limited Liability Companies".

While the Act provides that "it may", the order is so strict that it is possible to find that it is contrary to the Act and therefore illegal: "Wholesale distribution companies of pharmaceutical products must be constituted between pharmacists: either in the form of General Partnerships, or in Limited Liability Companies".

The situation is different in Kenya. The law does not lay down legal forms of organization that are allowed to carry out pharmacy activities. In this regard, and based on Article 21 of the Kenyan Pharmacy Act (related to Bodies corporate), since it does not specify the legal forms of organization authorized in the pharmacy business, it implies that it admits all legal forms of organization, including the cooperative form.

Specifically, under Kenyan law, stakeholders can freely establish cooperative pharmacies because the Cooperative Act does not set any limits and the Pharmacy Act does not include any exclusions.

Conclusions

Our analysis of the cooperative drug distribution sector in Kenya and Cameroon shows mixed results. While Kenyan laws allow the establishment of cooperative pharmacies, Cameroonian laws are less open.

It is recommended to advocate to the Cameroonian Ministry of Health for two possible actions:

1. A modification of the Cameroonian 1990 Pharmacy Act in order to admit, or at least no longer exclude, the cooperative form as a legal form authorized to carry out pharmacy activities. Indeed, the AUSCOOP has precedence over Cameroonian laws (national laws) and the latter must be brought into harmony with the provisions of the AUSCOOP.

2. Administrative tolerance towards cooperative pharmacy creation projects pending the revision of the Pharmacy Act.

Strategies to Promote COVID-19 Vaccination

Sara Taheri[1], Mahnaz Afshari[2], Fatemeh Kazemi[3], Maryam Saadati[3], Zahra Abdol[4], Alireza Jafari Azad[3], and Leila Eslambolchi[3]

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The reluctance of individuals to receive the COVID-19 vaccine has raised concerns about the collective immunization of communities and the management of the COVID-19 epidemic worldwide. Different countries have used various strategies for vaccination. However, their effectiveness is questionable.

Aims: The aim of this study was to identify and classify effective strategies and provide a model to increase the desire of individuals to receive the COVID-19 vaccine. This research was conducted using a mixed methods approach (archival data, scoping review, and Delphi method). The current status of COVID-19 vaccination was examined using archival data. Then, using a scoping review, strategies for persuading people to get the COVID-19 vaccine were searched in the Embase, PubMed, Medline, Web of Science, and Scopus databases, and Google Scholar search engine up to November 21, 2021. Screening and evaluation of 1728 identified articles resulted in 197 eligible documents.

Thematic content analysis was used to identify and classify strategies. These strategies were presented to 30 experts using the modified Delphi technique and an online questionnaire for evaluation using the “FAME” criteria. Finally, a model was developed to increase the willingness of individuals to receive the vaccine. A total of 131 strategies were identified to increase the desire of individuals to receive the COVID-19 vaccine. They were classified into five groups: "educational", "social", "media", "governance" and "economic". Improving access to vaccines and the safety and effectiveness of vaccines, enacting vaccination card regulations, developing vaccination social campaigns, correcting misconceptions about vaccines, and promoting national media and financial incentives were among the interventions used to promote the desire for the Covid vaccine. A comprehensive intervention model of "6Ps" (Provision, Precondition, Promotion, Public Awareness, People, and Prize) was developed to encourage individuals to receive COVID-19 vaccination.

Addressing the skepticism of the COVID-19 vaccine requires an understanding of the underlying reasons and applying a systemic intervention approach consisting of economic incentives, behavioral interventions, and assuring the safety of vaccines.

Strategies to Promote COVID-19Vaccination

Authors

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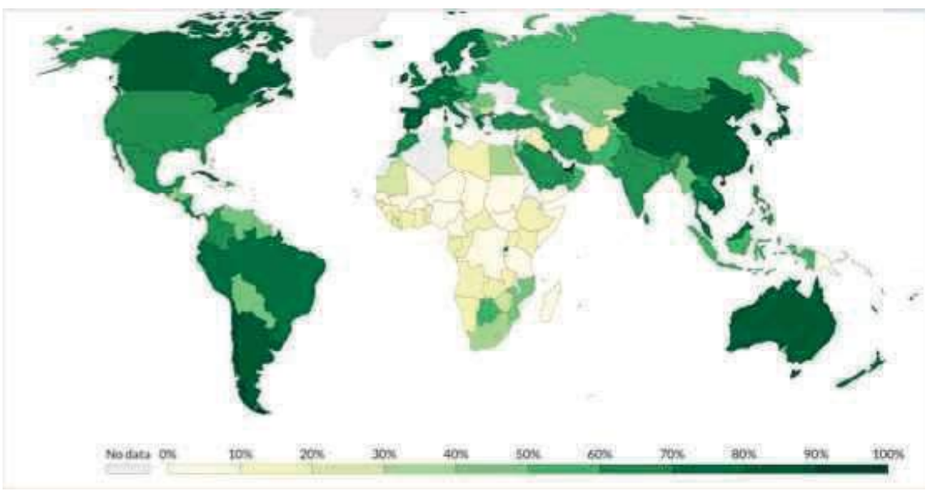
Background: The reluctance of some individuals to receive the COVID-19 vaccine has raised concerns about collective immunization and the management of the current pandemic. Different countries have used various strategies for vaccination. However, their effectiveness is questionable. This creates a need for designing effective evidence-based interventions for the promotion of vaccination, well-suited for the context of each country.



Aims: This study aimed to identify and classify effective strategies and provide a model to promote COVID-19 vaccination.

Methods: This research was conducted using a mixed-method approach. First, evidence-based strategies were defined through archival data and scoping review. Strategies for persuading people to take the vaccine were researched in Embase, PubMed, Medline, Web of Science, Scopus databases and the Google scholar search engine up to Nov. 21, 2021. Screening and evaluation of 1728 identified articles resulted in 197 eligible documents. Thematic content analysis was used to identify and classify strategies.

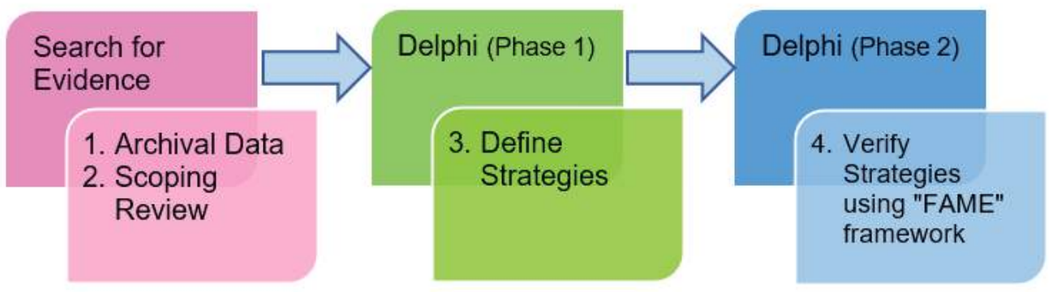


Figure 1. Evidence-based strategies.

Then, 30 health experts were purposefully chosen to participate in the study. Participants expressed their views on the evidence-based strategies via an online questionnaire in the first phase of Delphi. In the second phase, strategies were verified using the "FAME" framework. The feasibility, acceptance, meaningfulness and efficacy of each strategy were scored from 1 to 5, using a Likert scale. Strategies with a mean score of 3.5 or higher were considered valid.

Results: In total, 131 valid strategies to promote COVID-19 vaccination were identified. Valid strategies were classified in six groups, including Provision, Precondition, Promotion, Public Awareness, People and Prize.

Figure 2. The six Ps to promote COVID-19 vaccination.

Provision, Precondition and Propaganda scored the highest. Public Awareness, People and Prize had the lowest scores.

Table 1. The results of ranking solutions from the perspective of experts based on the average scores given.

Rank	Strategy	Average points	Feasible	Appropriate	Meaningful	Effective
1	Provision	3.32	3.34	3.26	3.24	3.43
2	Precondition	3.29	3.27	3.22	3.35	3.33
3	Promotion	3.23	3.33	3.24	3.20	3.16
4	Public Awareness	3.10	3.15	3.10	3.07	3.10
5	People	3.10	3.19	3.09	2.94	3.19
6	Prize	3.08	3.21	3.07	2.94	3.11

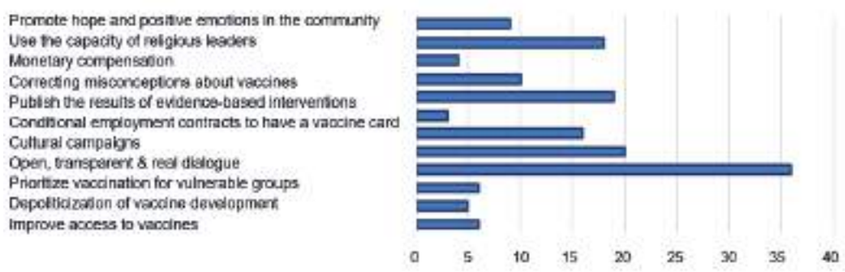


Figure 3. The most common solutions

Conclusions: Addressing the skepticism towards the COVID-19 vaccine requires an understanding of the underlying reasons and the application of a systemic interventional approach consisting of:

- Understanding human behaviors;
- Understanding preferential cognitive motivations;
- Designing human-centered programs;
- Simultaneous implementation of all six policies;
- Quickly developing quantitative policy-monitoring guidelines.

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Community Involvement for Better Access to Potable Water in Households in Communities of the Lake Chad Basin and of Slum Areas of Douala in Cameroon

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Access to potable water remains a challenge in Sahelian areas and urban slums of cities in Africa. This project was conducted to respond to households' needs regarding access to potable water in areas with the most limited access to water in Cameroon. Four health districts were targeted, including two in the Lake Chad Basin (LCB) and two in Douala, the biggest city of Cameroon known to have limited access to water and a high population burden to waterborne diseases. From the findings of the households baseline survey, a program was developed involving: (i) selecting community health volunteers (CV) and training them on water treatment by chlorination and solar disinfection (SODIS),
(ii) assigning CV to visit and train households weekly for a year on these water treatment methods, and assisting them in choosing their adapted water treatment method and monitoring their skills in the chosen method. Data were collected weekly to assess households' coverage in terms of water treatment methods. Of 10790 households reached in the baseline survey, 5170 (47.9%) and 5620 (52.1%) households were located in Douala and LCB, respectively. In Douala, 292 (5.6%) and 191 (3.7%) households declared to always and sometimes treat their drinking water, respectively, with 1 (0.02%) household treated by SODIS and 142 (2.7%) by chlorination. In LCB, 188 (3.4%) and 692 (12.3%) households declared to always and sometimes treat their drinking water, respectively, with 8 (0.1%) treated by SODIS and 431 (7.7%) by chlorination. The intervention involved 120 communities with their CV that conducted 55934 household visits in a year, including 33135 (59.2%) in Douala and 22199 (39.7%) in the LCB. In Douala, water treatment was reported from 10006 (30.2%) visits, including 856 (2.6%) by SODIS and 4796 (14.5%) by chlorination. In LCB, water treatment was reported from 11548 (52.0%) visits, including 5109 (23.0%) by SODIS and 3102 (14.0%) by chlorination. This project presents an efficient intervention that can be used to autonomise communities in improving their access to potable water. Reported adhesion to proposed water treatment methods was different in Douala and LCB, suggesting that the efficiency of health interventions proposed to communities may vary according to contexts.

Community Involvement for Better Access to Potable Water in Households in Communities of the Lake Chad Basin and of Slum Areas of Douala in Cameroon

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Introduction

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Methods

Four health districts were targeted, including two in the Lake Chad Basin (LCB) and two in Douala, the biggest city of Cameroon, known to have limited access to water and a high population burden of waterborne diseases. From the findings of households' baseline surveys, a program was developed involving: (i) selecting community health volunteers (CV) and training them on water treatment via chlorination and solar disinfection (SODIS), (ii) assigning CV to visit and train households weekly for a year on these water treatment methods, and assisting them in choosing their adapted water treatment method and monitoring their skills in the chosen method. Data were collected weekly to assess households' coverage in terms of water treatment methods.

Results

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Conclusions

This project presents an efficient intervention that can be used to empower communities in improving their access to potable water. The reported adhesion to proposed water treatment methods was different in Douala and LCB, suggesting that the efficiency of health interventions proposed to communities may vary according to contexts.

The Appointment System at the Primary Healthcare Level in Albania Triggered under COVID-19 Pandemic Shows Potential for Better Services

Joëlle Troxler[1,2], Ehadu Mersini[2], Irma Qehajaj[1], B. Nuri[2], and Kaspar Wyss[2,3,4]
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While scheduling consultations in PHC settings is common in Western European countries, Albanian public health centers (HC) operate on a walk-in basis. These leads to several problems such as long waiting queues and overcrowded corridors, particularly in the morning hours. To prevent the spread of COVID-19 infections at HC premises, a public HC in Albania implemented an appointment system for patients with NCD, pregnant women, and children. The objective of this paper is to present the findings of the evaluation of the one-year implemented appointment system in an Albanian governmental HC. The employed qualitative approach included in-depth interviews with the HC managerial team, health workers, and patients benefitting from the structured appointed system and a HC operating on a walk-in basis. Additionally, a cost analysis of the appointment system was carried out. The health workers and patients were both very satisfied with the appointment system. The initial fears and concerns of health workers that an appointment system might not be accepted by users could not be confirmed. The appointment system resulted in more efficient service provision to patients with NCDs, children, and pregnant women, as well as longer patient-doctor interactions due to better time management and well-prepared and structured consultations. Furthermore, the new system led to less crowded and noisy corridors, as well as better organized daily work of family doctors and nurses. This has allowed for better compliance with the COVID-19 preventive measures and improved handling of patients infected by the virus through the provision of scheduled home visits and remote and on-site consultations. Main challenges of the system were no-shows of patients, especially at the beginning of the implementation phase, the additional administrative burden of arranging appointments, and the sustainability of the system due to running telephone costs respectively. Appointment systems in PHC allow for improved handling of patient influx during the COVID-19 pandemic and beyond. It has a positive impact on the health service organization, efficiency of service provision and time available for patient-doctor interactions leading to improved care. This positively influences the acceptance of the system among patients and health workers.

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Background

While scheduling consultations in primary health care settings is common in Western European countries, Albanian public health centres operate on a walk-in basis. These leads to several problems, such as long waiting queues and overcrowded corridors, particularly in the morning hours. To prevent the spread of COVID-19 infections, a public health centre in Albania implemented an appointment system for patients with chronic condition(s), pregnant women, and children. Appointment systems are used to better plan and structure consultations for patients who should be seen by a doctor on a regular basis. The main goal is to deliver timely and convenient access to health care services for all patients.

Figure 1. Family nurses vaccinating a child (Copyright Bevis Fusha/MoHSP)

Study Design

In 2021, we evaluated the advantages and challenges as well as the costs of one of the first implemented appointment systems in a primary health care centre in Albania. The qualitative approach employed included semi-structured in- depth interviews with the health centre managerial team, key health professionals and patients benefitting from the structured appointed system. A cost analysis of the appointment system was carried out, as well.

Evaluation of the Albanian Appointment System Advantages

- Improved handling of patients that are infected by the COVID-19 virus and organization of vaccination is possible.
- Quality of care is higher because there is time to prepare consultations and more dedicated time from the doctor for the patients during the consultations.
- Waiting time for patients is reduced (from up to one hour to mostly five minutes).
- Thanks to the appointed consultations, a more efficient distribution of the workload throughout the day and opening hours is possible (about 66% of consultations are planned).
- Less crowded and noisy corridors allow for calm and undisturbed consultations.

Challenges

- There is an additional administrative burden of arranging appointments.
- No-shows at the beginning of the implementation phase result in unproductive time.
- Sustainability of the system due to running costs of about CHF 2,400 per year. However, these additional costs are offset by efficiency gains and quality improvements.

Table 1. Running costs of appointment system per month

	Quantity	CHF
Maintenance of electronic agenda	13	122.-
Maintenance of phone system	13	26.-
Invoice for outgoing calls (limit)		17.-
Printing appointment cards	1'100	6.-
Paper-based agendas & table calendar	39	30.-
Total		**201.-**

Conclusions

Appointment systems in primary health care allow for an improved handling of patient influx during the COVID-19 pandemic and beyond. They have a positive impact on the health service organization, the efficiency of service provision and the time available for patient–doctor interactions, potentially leading to improved care. This positively influences the acceptance of the system among patients and health workers. A successful and sustainable appointment system in primary health care must be financed and properly supported with information technology (computers, electronic agenda) and a good communication system (phone system).

Autonomic Nervous System Dysregulation in Young People with a History of COVID-19

Ekaterina Zavgorodnyaya[1], Svetlana Tymchenko[2], and Anna Bogdanova[2]
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Increasing numbers of COVID-19 patients continue to experience symptoms weeks and months after recovery. 'Long COVID' could be possibly related to a virus- or immune-mediated damage of the autonomic nervous system (ANS) responsible for adaptation as it regulates vital functions such as cardiovascular and respiratory, most commonly affected by COVID-19. However, the involvement of ANS in post-COVID, expressed by dysautonomia, has not been studied well.

The objectives of this pilot study were to: Study the features of heart rate variability (HRV) in young people as a marker of ANS activity. Evaluate the differences in HRV in subjects with and without a history of COVID-19. A total of 32 healthy young people (18.4 ± 0.8 y/o) were tested in September 2020. Upon re-registration in February 2021, the subjects were divided into groups: 1st - 13 people (five females) with a history of COVID-19; 2nd (control) - 19 individuals (12 females) without prior infection.

The state of the ANS was assessed by the HRV recorded at rest and during the orthostatic test (Varicard 2.6, Russia). Statistical analysis was performed using the software StatTech v. 1.2.0 (LLC "StatTech", Russia). HRV recordings in February during the orthostatic test in group 1 revealed increased parasympathetic (RMSSD, HF) indices compared to September recordings ($0.003 \leq p \leq 0.037$) and lower HR and LF/HF values ($0{,}019 \leq p \leq 0{,}034$). The values of Xmax, MxDMn, MxMn, and HF were higher ($0.012 \leq p \leq 0.033$) in subjects with a history of COVID-19, and AMo50% ($p = 0.024$), SI ($p = 0.006$) were lower compared to the controls suggesting greater activity of the parasympathetic nervous system in group 1 during the orthostatic test. These results indicate dysregulation of autonomic cardiac control during orthostatic tests in individuals with a history of COVID-19. Post- COVID HRV dysregulation may explain some of the persistent symptoms, such as tachycardia, palpitations, and orthostatic intolerance. Monitoring the state of ANS via HRV is important for understanding the pathophysiology of this condition and for predicting complications.

Autonomic Nervous System Dysregulation in Young People with a History of COVID-19

Authors

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Introduction

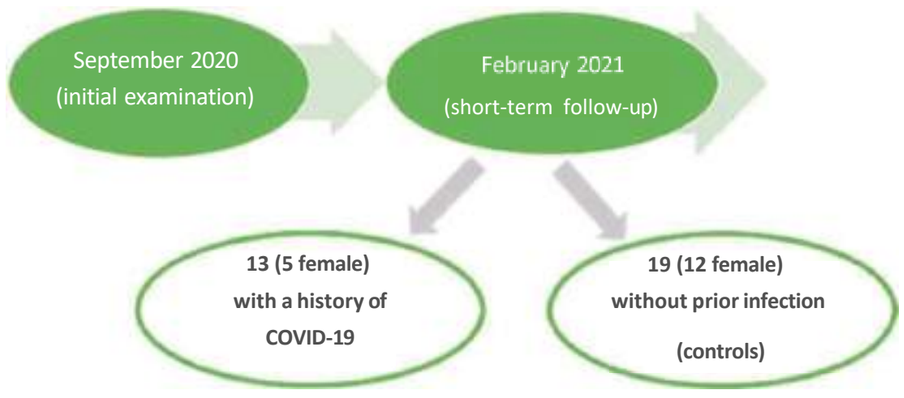
Increasing numbers of COVID-19 patients continue to experience symptoms weeks and months after recovery. 'Long COVID' could possibly be related to virus- or immune-mediated damage of the autonomic nervous system (ANS) responsible for adaptation, as it regulates vital functions such as cardiovascular and respiratory mechanisms, most commonly affected by COVID-19. However, the involvement of ANS in post-COVID, expressed by dysautonomia, has not been studied well.

Objectives

- To study the parameters of heart rate variability (HRV) in young people as a marker of ANS activity.
- To evaluate the differences in HRV indices and ANS activity in subjects with and without a history of COVID-19.

Methodology

Total of 32 healthy young people (18.4 ± 0.8 years old).



The state of the ANS was assessed using the HRV 5 minute recordings at rest and during the orthostatic test (Varicard 2.6, Russia).

Statistical analysis was performed using StatTech v.1.2.0 software (LLC "StatTech", Russia).

Results and Discussion

HRV recordings (Figure 1) in February during the orthostatic test in group 1 revealed increased parasympathetic (RMSSD, HF) indices compared to September's recordings (0.003 ≤ p ≤ 0.037) and lower HR and LF/HF values (0,019 ≤ p ≤ 0,034).

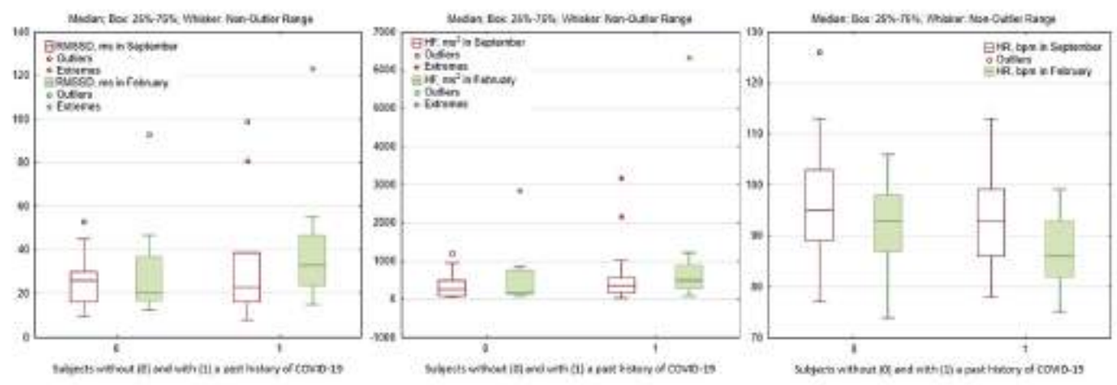


Figure 1. Dynamics of HRV parameters (RMSSD, HF, HR) in subjects without (0) and with (1) a past history of COVID-19.

Results and Discussion

RMSSD increased from 23 (16 - 39) ms to 33 (24 - 47) ms (p = 0.037), and HF from 365 (174 - 549) to 492 (276 - 883) ms^2 (p = 0.021).

The values of Xmax, MxDMn, MxMn and HF were higher (0.012 ≤ p ≤ 0.033) in subjects with a history of COVID-19, and AMo50% (p = 0.024) and SI (p = 0.006) were lower (Figure 2) compared to the controls, suggesting greater activity of the parasympathetic nervous system in group 1 during the orthostatic test.

Gender differences revealed that RMSSD, pNN50, SDNN, TP and HF were 1.3–5 times higher in men (0.002 ≤ p ≤ 0.025) than in women during the orthostatic test in group 1.

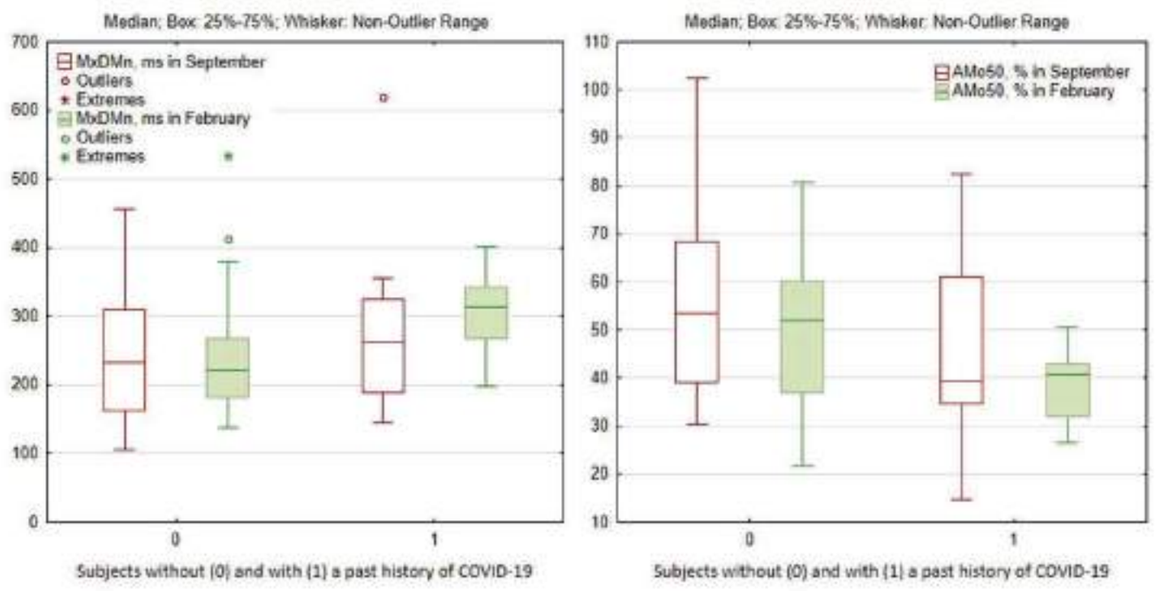


Figure 2. Dynamics of HRV parameters (MxDMn, AMo) in subjects without (0) and with (1) a past history of COVID-19.

These results indicate a dysregulation of autonomic cardiac control during the orthostatic test in individuals with a history of COVID-19. Naturally, sympathetic function increases immediately after changing to a standing position. Clinical data suggest that people with COVID-19 show a higher sympathetic nervous system tone during the acute infection, and in early days and weeks in the convalescence, as well. Later on during the course of the disease, there might be a reactive 'overshoot' of parasympathetic activity.

Conclusions

Post-COVID HRV dysregulation may explain some of the persistent symptoms, such as fatigue, dizziness, palpitations and orthostatic intolerance. Prolonged parasympathetic activity might be responsible for these symptoms. HRV is a simple, non-invasive and validated measure for the assessment of the ANS function. Monitoring the state of ANS via HRV is important for understanding the pathophysiology of "long COVID" and for predicting complications.

Conflicts of Interest

The authors declare that there are no conflicts of interest regarding the publication of this article.

Impact of Health Spoken Tutorials, IIT-B, on Effective Breastfeeding Practices on Prevention and Treatment of Undernutrition at Three Months: Preliminary Findings of a Case-Control Study from the Dept. of Health, Govt of Banaskantha, Gujarat, India

Milindkumar Ukey[2], Manishkumar Fancy[1], Rupal Dalal[1,2,3], Marian Abraham[2,3], Apoorva Nambiar[2,3], Thirumal Reddy[2,3], and Satish Agnihotri[2,3]

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Breastfeeding, the most important source of nutrition in infants and young children, even if exclusive, can be sub-optimal if the technical skills and practices are not appropriate, resulting in poor milk transfer to the baby. Community-based interventions that involve training mothers and caregivers on skills can be an important approach to preventing weight faltering. The current study evaluates the impact of counseling on breastfeeding skills during ANC/PNC and growth monitoring on the nutritional status of infants under six months of age. The study is an experimental (case-control) study that compares the outcomes of the Standard Care Group (n=270) and Intervention Group (n=288). The research was conducted within the existing public health infrastructure of Banaskantha district, Gujarat, India. The study respondents were pregnant women who were enrolled in the last trimester of pregnancy. Women in standard care received home visits from female community health workers post-delivery up to six months of delivery, whereas women in the intervention group received the same in addition to education on effective breastfeeding practices (e.g., cross cradle hold) during ANC/PNC periods. The counseling was delivered mainly through health-spoken tutorials created at IIT-Bombay in the local language. Descriptive statistics were obtained, and statistical tests were applied to check for the efficacy of the intervention. Preliminary analysis of data at three months suggests that there was a significant impact of counseling on effective breastfeeding practices during the ANC/PNC period in reducing underweight prevalence among babies at three months. The mean weight gain (gm/day) at three months was higher in the intervention group (32.2±5.7) as compared to the standard care group (28.2±7), and the differences were statistically significant ($p<0.001$). 89.6% achieved weight gain of more than 25 gm/day in the intervention group compared to 65.9% in standard care. Also, in this group, underweight prevalence was nearly three times that of the intervention group at three months. In the context of COVID-19, where nutrition program delivery has become constrained, there is also a greater need for low-cost community interventions that adopt dynamic counseling methodologies to carry out impactful behavior change.

Impact of Health Spoken Tutorials, IIT-B, on Effective Breastfeeding Practices on the Prevention and Treatment of Undernutrition at Three Months: Preliminary Findings of a Case-Control Study from the Dept. of Health, Govt of Banaskantha, Gujarat, India

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Background

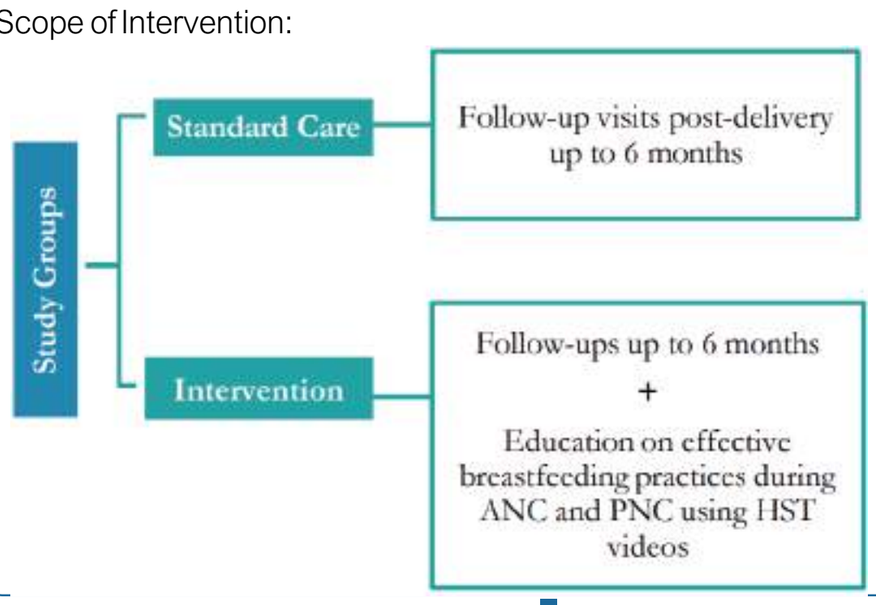
Breastfeeding is the most important source of nutrition in infants and young children, but even if used exclusively it can be sub-optimal if the technical skills and practices are not appropriate, resulting in poor milk transfer to the baby. In this context, community-based interventions that involve training mothers and caregivers on skills can be an important approach to prevent weight faltering.

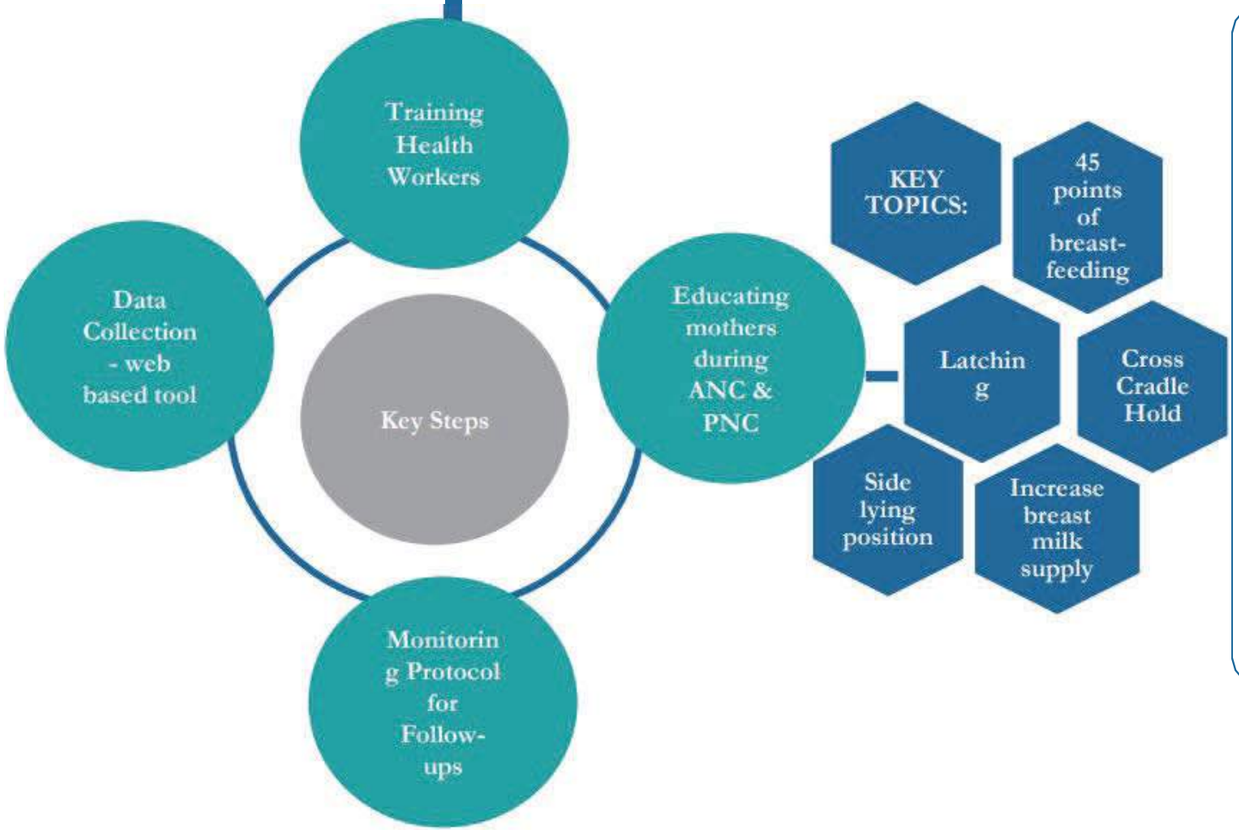
Objective

To evaluate the impact of a nutrition education intervention (counselling on effective breastfeeding practices) using Health Spoken Tutorials (HST, developed at IIT Bombay) during the ANC/PNC period and systematic growth monitoring on the nutritional status of an infant at three months of age.

Methodology

- Research Design: Experimental (case-control);
- Sampling: The research was conducted within the existing public health infrastructure of the Health Department of the Government of Banaskantha district, Gujarat, India. In total, 20 PHCs were selected for each study group. Both intervention PHCs and non- intervention PHCs were from two different regions of Banaskantha, Gujrat, India;
- Data Collection: Web-based application (kobo);
- Study respondents: Pregnant women in the last trimester of pregnancy.
- Scope of Intervention:





Results

The mean weight gain (gm/day) at 3 months was higher in the intervention group (32.2±5.7) compared to the standard care group (28.2±7), and the difference was observed to be statistically significant ($p<0.001$). In total, 89.6% achieved a weight gain of more than 25 gm/day in the intervention group compared to 65.9% receiving standard care.

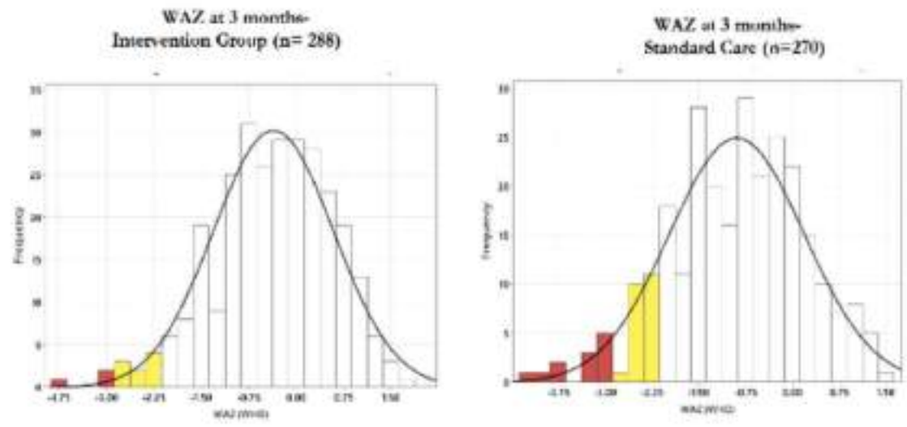


Figure. WAZ distribution at 3 months

Underweight prevalence in the standard care group was nearly three times that of the intervention group at 3 months.

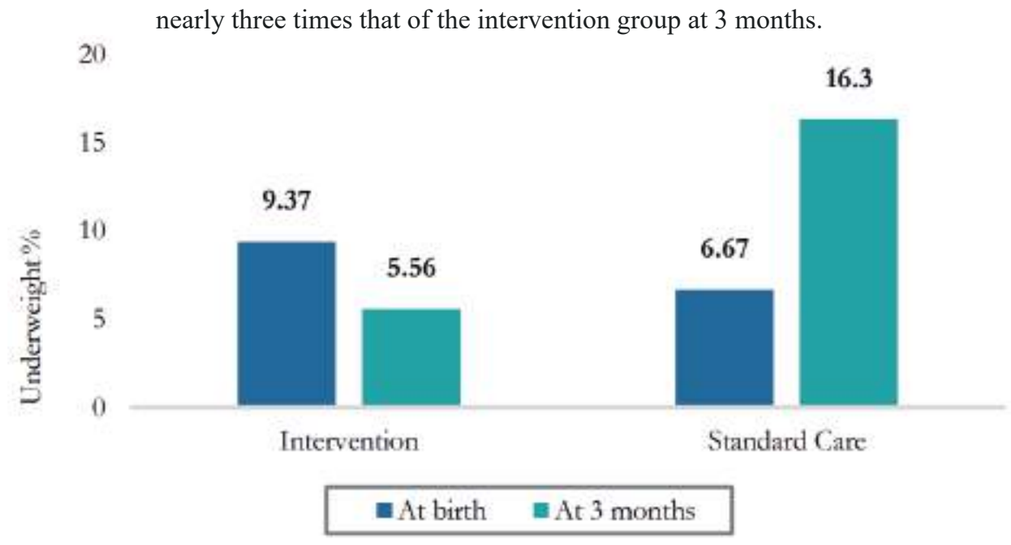


Figure. Underweight prevalence at birth and at 3 months

Conclusions

Preliminary analysis of the data suggests that there was a significant impact of counselling on effective breastfeeding practices using HST during the ANC/PNC period in reducing and preventing undernutrition among babies at 3 months.

Future Scope for Public Health

This is likely the first experimental study that examines the impact of education on effective breastfeeding practices such as cross-cradle hold on nutritional outcomes.

The paper suggest a pathway by which existing government programs can reduce undernutrition and prevent growth faltering at an early stage.

In the context of COVID-19, where nutrition program delivery has become constrained, there is also a greater need for low-cost community interventions that adopt dynamic counselling methodologies to carry out impactful behavior change. The Health Spoken Tutorials have potential for uptake by various countries.

The World Needs Pandemic Preparedness Goals

Anne-Mieke Vandamme[1,2] and Jan-Peter Sandler[3,4] on behalf of the Coronavirus Pandemic Preparedness Team[5]
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In February 2020, KU Leuven Institute for the Future gathered a transdisciplinary learning team to consider pandemic preparedness as a wicked problem, observe the COVID-19 pandemic, and draw lessons for the future. We found pandemic preparedness in Belgium and worldwide needs improvement. Taking inspiration from the SDGs, we suggest developing Pandemic Preparedness Goals (PPGs) before the next pandemic hits to help policymakers and society implement lessons from the past for better preparedness for the next pandemic. We propose 7 PPGs. **PPG1** Prepare to limit the spread of a pandemic pathogen. **PPG2** Improve healthcare to include the entire human being, body, mind, and social relations. **PPG3** Equip governments to meet a pandemic challenge. **PPG4** Prepare to maintain societal values during a pandemic. **PPG5** Prepare to maintain societal functions during a pandemic. **PPG6** Improve and professionalize crisis communication. **PPG7** Equip citizens and institutions with adaptive capacity through fostering transdisciplinary learning and education. This list serves to initiate a process whereby PPGs with associated targets and indicators can be developed together with the many layers of society, both internationally and locally. The process itself will rebuild trust between politicians, scientists, and citizens, an essential prerequisite to pandemic preparedness. It will also contribute to increasing societal resilience, another essential quality in any crisis. Setting international goals is working for SDGs that are currently mobilizing entire societies.

We need to use the momentum of the COVID-19 pandemic to start the process. We cannot change the past, but we can reshape the future.

The World Needs Pandemic Preparedness Goals

Authors

Anne-Mieke Vandamme[1,2] and Jan-Peter Sandler[3,4] on behalf of the Coronavirus Pandemic Preparedness Team[5]

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Background: In February 2020, the Institute for the Future at KU Leuven established a learning team with the explicit task of learning from the current pandemic in Belgium in order to be better prepared for a future pandemic. The purpose was to observe the current pandemic and to reflect on what went well and what could be done better in future.

Methodology: The team used the Designing Feasible Futures Framework (DF3), which iteratively cycles through four types of transdisciplinary activities to co-create systems knowledge, target knowledge and transformation knowledge (Figure 1).

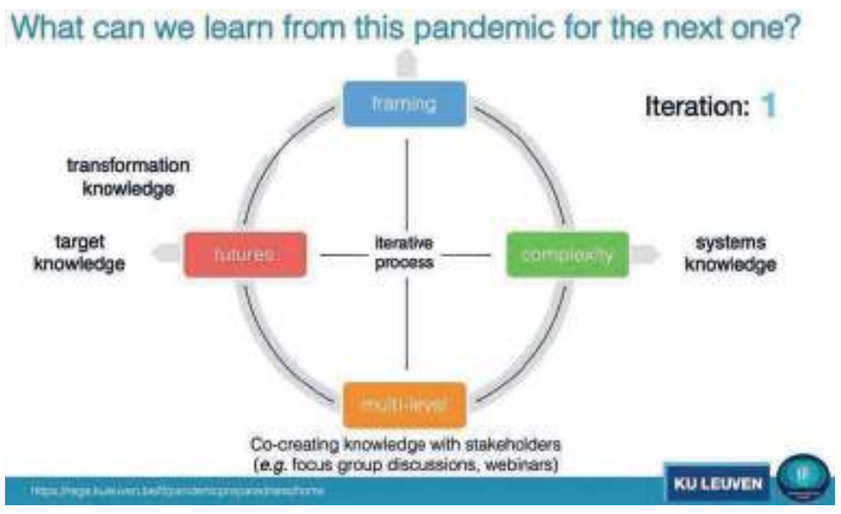
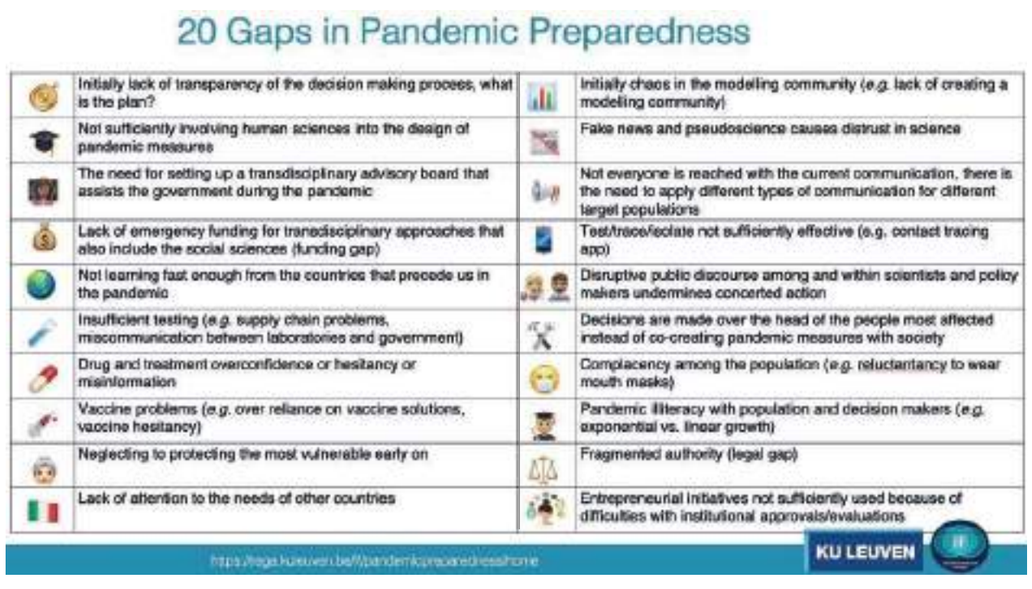


Figure 1. Schematic drawing of the Designing Feasible Futures Framework (DF3) Illustrating the initial framing "What can we learn from this pandemic for the next one?"



20 Gaps in Pandemic Preparedness

Initially lack of transparency of the decision making process, what is the plan?	Initially chaos in the modeling community (e.g. lack of creating a modeling community)
Not sufficiently involving human sciences into the design of pandemic measures	Fake news and pseudoscience causes distrust in science
The need for setting up a transdisciplinary advisory board that assists the government during the pandemic	Not everyone is reached with the current communication, there is the need to apply different types of communication for different target populations
Lack of emergency funding for transdisciplinary approaches that also include the social sciences (funding gap)	Test/trace/isolate not sufficiently effective (e.g. contact tracing app)
Not learning fast enough from the countries that precede us in the pandemic	Disruptive public discourse among and within scientists and policy makers undermines concerted action
Insufficient testing (e.g. supply chain problems, miscommunication between laboratories and government)	Decisions are made over the head of the people most affected instead of co-creating pandemic measures with society
Drug and treatment overconfidence or hesitancy or misinformation	Complacency among the population (e.g. reluctantancy to wear mouth masks)
Vaccine problems (e.g. over reliance on vaccine solutions, vaccine hesitancy)	Pandemic illiteracy with population and decision makers (e.g. exponential vs. linear growth)
Neglecting to protecting the most vulnerable early on	Fragmented authority (legal gap)
Lack of attention to the needs of other countries	Entrepreneurial initiatives not sufficiently used because of difficulties with institutional approvals/evaluations

https://rega.kuleuven.be/if/pandemicpreparedness/home KU LEUVEN

Table 1. A list of 7 pandemic preparedness goals (PPGs) with associated targets, as co-created with Belgian stakeholders, inspired by SDGs. (https://rega.kuleuven.be/if/pandemicpreparedness/potential-pandemic-preparedness-goals-targets-and.pdf.

Results

Iteration 1: systems knowledge = a list of gaps in Belgium's pandemic preparedness (Figure 2); desirable future = better societal resilience.

Iteration 2: systems knowledge = 27 lessons learned; desirable future = pandemic preparedness goals (PPGs) (https://rega.kuleuven.be/if/pandemicpreparedness/introducing-pandemic-preparedness-goals).

Iteration 3: systems knowledge = a list of seven potential PPGs and associated targets (Table 1); desirable future = co- creation of those seven PPGs and their targets and indicators within all levels of society.

Currently at Iteration 4: systems knowledge = a methodology on how to locally co-create PPGs, targets and indicators, in order to better fit to the local situation. The team's current view of a desirable future = the continuous process of co-creation builds trust among and between scientists, politicians and citizens.

PPG1: Prepare to limit the spread of a pandemic pathogen. *Targets*: improve surveillance, prepare containment and mitigation strategies, improve host resistance. Rapid development of diagnostics is possible, broad-spectrum therapeutics are available, prepare for rapid availability of vaccines.

PPG2: Improve healthcare to include the entire human being. *Targets*: optimize surge capacity, improve health literacy, protection of vulnerable groups, integrate mental health into health care, integrate care for social relations into health care, set up a reflection board to evaluate cost and benefit to the integrated health of implemented measures.

PPG3: Equip governments to meet a pandemic challenge. *Targets*: fast and clear decision making, restrictions on rights and freedoms are legally determined, install transdisciplinary advice boards, provide a framework for consulting stakeholders, provide a framework for the enforcement of necessary measures, ensure evidence-based governance, participate in international strategies, install government alertness.

PPG4: Prepare to maintain societal values during a pandemic. *Targets*: protect democratic values, maintain a broad societal view, reduce health inequality, establish ethical reflection boards.

PPG5: Prepare to maintain societal functions during a pandemic. *Targets*: business, government and education continuity plans are in place, supply chain risks are mitigated, continuity plans exist for the self-employed, reserve funds are available.

PPG6: Improve and professionalize crisis communication. *Targets*: transparency about objectives, reach out to all layers of society, address the infodemic, combat spread of fake news, invest in good communication, invest in transdisciplinary consultation and communication.

PPG7: Equip citizens and institutions with creative and adaptive capacity through fostering learning and educating. *Targets*: establish a transdisciplinary learning culture, implement society-wide evaluation exercises, implement lessons learned to improve pandemic preparedness, include transdisciplinary skill sets in all education plans, train decision makers, advisers, media and the general population in pandemic literacy.

Conclusions: The need to improve pandemic preparedness is high, in Belgium and worldwide. The pandemic is still raging, and we need to continue to learn. Taking inspiration from the Sustainable Development Goals, or SDGs, the team has argued that the world needs Pandemic Preparedness Goals, or PPGs, and proposes a list of seven PPGs. The transdisciplinary process of developing such goals before the next pandemic hits, with clear targets and specific indicators, will help policy makers and society at large to remember the lessons from the past, to better prepare for the next pandemic, and by doing so to increase trust. Setting international goals has worked for UN SDGs that are currently mobilizing entire societies. We also need it to work for PPGs, using the momentum of the COVID-19 pandemic. We cannot change the past but we can reshape the future.

Acknowledgements:

Funding: King Baudouin Foundation, Department of Economy Science & Innovation, Flanders, Doctoral School of Humanities and Social Sciences.

Partners: Institute of Tropical Medicine, Antwerp, Vrije Universiteit, Brussels.

Stakeholders: https://rega.kuleuven.be/if/pandemicpreparedness/stakeholder_advisory_group.

Interviewees: Ritva Halila, Laurette Hieber Girardet, Katelyn Jetelina, Michael Jordan, Heidi Larson, Laurence Lwoff, John Nkengasong, Peter Piot, Maria Van Kerhove, Jean-Pascal van Ypersele.

A Granular Analysis of Snakebite Cases in India and its Spatial Trends

Thirumal Reddy Vennam, Prachi Shukla, Khushboo Balani, Jitendra Shah, and Satish Agnihotri
Indian Institute of Technology Bombay, Mumbai, India

India is home to half of the total snakebites and more than half of the snakebite-related deaths in the world. However, it continues to be a low-priority issue for the government. The susceptibility to snakebites has only increased in recent times due to increased urbanization and resultant deforestation. While past analyses have identified the high-burden states, we identified hotspots at the district level for improved targeting of resources and preventive action. We also identified the time periods of peak incidence at the disaggregated levels to feed into the early-warning systems, thereby informing the anti-venom inventory management at local levels. Lastly, we examine the relationship between cropping patterns and the incidence of snakebites. We use the official HMIS database, which provides monthly data from health facilities across the country. Most studies have relied on primary data collection to inform their analysis. The time period of our analysis is FY18- FY20. The unit of analysis is districts and states. We use the univariate Local Indicators of Spatial Autocorrelation (LISA) technique to identify the hotspots of snakebites. Lastly, we present correlational estimates between the nature of crops and the incidence of snakebites to enhance our understanding of the determinants of snakebites. Just 77 districts (out of 703) constituted 52.7% of the snakebite cases in the country between FY18-FY20. LISA analysis identified 63 hotspots (Moran's I = 0.516), with 62 being located in four states Andhra Pradesh, Tamil Nadu, West Bengal, and Maharashtra. The peak months for the incidence of snakebites differ across states, with June to October (cropping season) being the most common time period. While paddy cultivation is usually found to be correlated with a greater incidence of snakebites, we found that cropped areas under coarse grains (millets, sorghum) had a higher correlation [0.48] than cereals (rice, wheat) [0.37]. The HMIS database, despite its limitations, provides monthly data for monitoring the burden of snakebites across districts. Since health is a state subject in India, preventive and curative efforts should be directed towards the identified hotspots by the respective state governments. The limited availability of official data on this issue reiterates the need for investment in data-collection efforts.

A Granular Analysis of Snakebite Cases in India and their Spatial Trends

Authors

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Indian Institute of Technology Bombay, Mumbai, India

Introduction

India is home to half of the total snakebites and more than half of the snakebite-related deaths in the world, yet it continues to be a low-priority issue for the government. The susceptibility to snakebites has only increased in recent times due to an increased urbanisation and resultant deforestation. While past analyses have identified the high-burden states, we identified hotspots at district-level for the improved targeting of resources and preventive action. We also identified the time periods of peak incidence at the disaggregated levels, to feed into the early warning systems, thereby informing the anti-venom inventory management at local levels. Lastly, we examined the relationship between cropping patterns and incidence of snakebites.

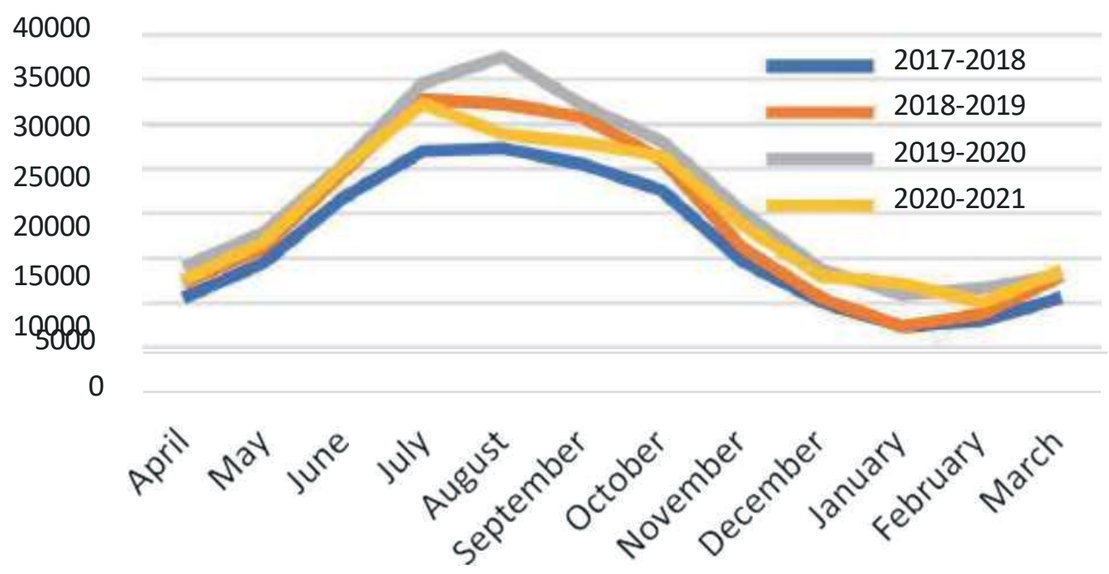

Figure 1. Seasonality of total snakebites (2017-21) (Source: HMIS).

Methodology

We used the official HMIS database, which provides monthly data from health facilities across the country. Most studies have relied on primary data collection to inform their analysis. The time period of our analysis was FY18-FY20. The unit of analysis was districts and states. We used the univariate Local Indicators of Spatial Autocorrelation (LISA) technique to identify the hotspots of snakebites. Lastly, we present correlational estimates between the nature of crops and incidence of snakebites to enhance our understanding of the determinants of snakebites.

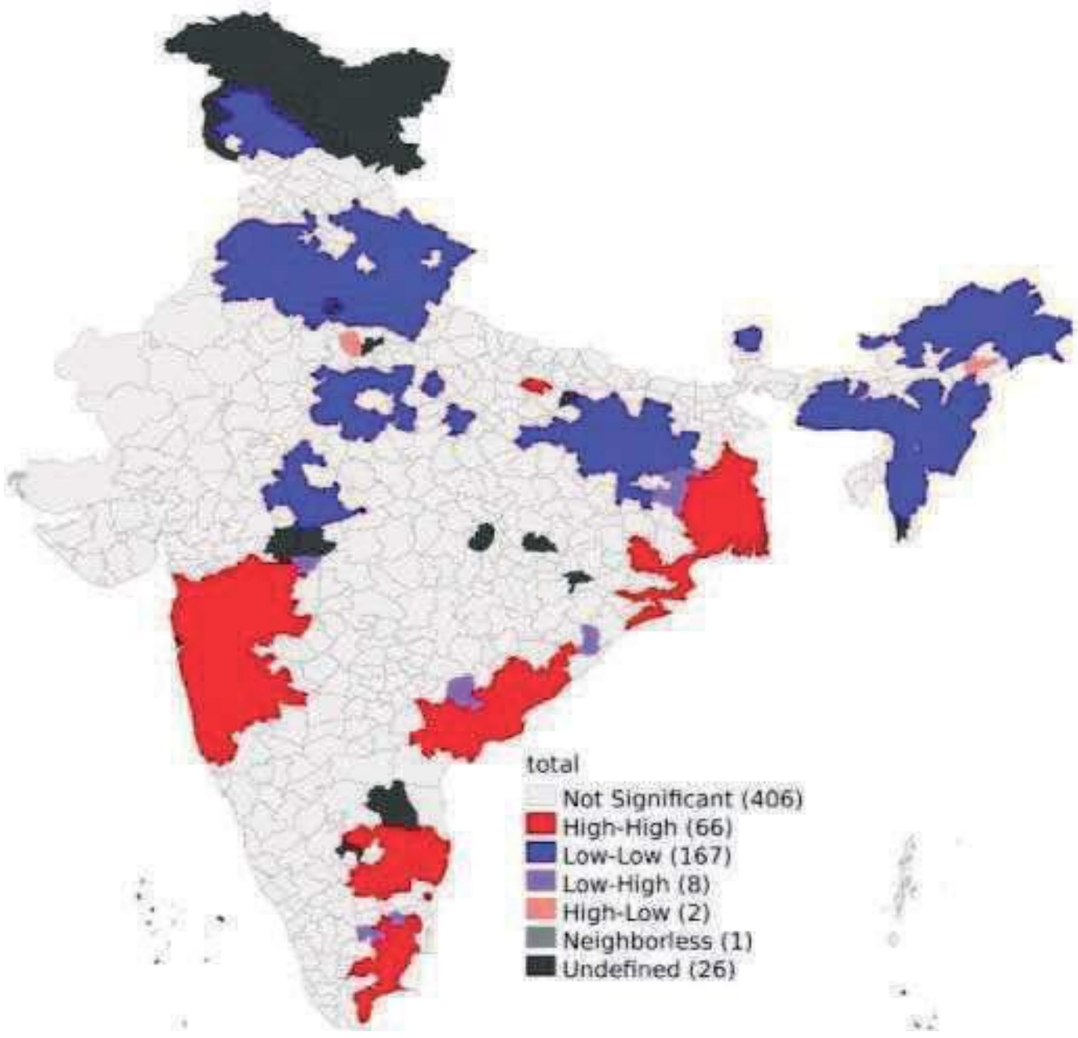

Figure 2. LISA map for total snake bites (2019-20) (Source: HMIS).

Results

Just 77 districts (out of 703) constituted 52.7% of the snakebites cases in the country between FY18 and FY20. The LISA analysis identified 63 hotspots (Moran's I = 0.516), with 62 being located in the four states of Andhra Pradesh, Tamil Nadu, West Bengal and Maharashtra.

The peak months for incidence of snakebites differed across states, with June to October (cropping season) being the most common time-period. While paddy

Cultivation is usually found to be correlated with a greater incidence of snakebites, we found that cropped areas under coarse grains (millet, sorghum) had a higher correlation [0.48] than cereals (rice, wheat) [0.37].

Conclusions

The HMIS database, despite its limitations, provides monthly data for monitoring the burden of snakebites across districts. Since health is a state subject in India, the preventive and curative effort should be directed towards the identified hotspots by the respective state governments. The limited availability of official data on this issue reiterates the need for investment in data- collection efforts. The study highlights the need for quality data to better inform anti-venom inventory management.

A Human Rights Perspective for an International Treaty on Preparedness and Response to Pandemics

Leandro Viegas, Deisy Ventura, and Miriam Ventura
Universidade de São Paulo (USP), Brasília, Brazil

As part of the legislative production concerning the various international responses to the COVID-19 pandemic, we identified the need for a human rights approach to vulnerability protection against gender and racial discrimination and violence and to promote access to health technologies and international assistance. We used desk research and a non-systematic review to collect the main proposals for a new pandemic preparedness and response treaty. We classified the proposals into four categories: democratic arrangements; transparency and control mechanisms; coercive powers; and political coordination mechanisms. We defined the main proposals that were repeated in the working papers and the articles researched or even proposals that seemed innovative for institutional evolution within the global health framework. In the COVID-19 pandemic, even with the WHO initiatives to promote access to health technologies, such as the ACT and COVAX facility, vaccine doses were concretized in developed countries, confirming the catastrophic moral failure of health apartheid. This situation could lead the world to further epidemic outbreaks. We have proposed that, to combat this type of scenario, the WHO must gain the "teeth" to call on member states to step up vigilance and institute independent assessments of sorts, new mechanisms for declaring health emergencies, and the installation of universal periodic reviews such as those of the human rights system. At the same time, the WHO could adopt sanctions against defaulting states and the creation of a Global Council of Health Threats. The pandemic preparedness and response system needs to be strengthened with political commitment to guarantee a human rights approach.

A Human Rights Perspective for an International Treaty on Preparedness and Responses to Pandemics

Authors

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Objectives

Within the legislative production regarding the different national and international responses to the covid-19 pandemic, we identified the absence of a human rights perspective that could provide protection to the vulnerable populations, fight gender and race discriminations and violence, and support the promotion of access to health technologies and to international assistance. Amongst the several proposals of a transformation to the current system of preparedness and response to pandemics, we sought to identify those which would consider a human rights perspective no only to the protection of vulnerable populations but also in terms of institutional evolution regarding the current global health architecture.

Methodology

We applied a document research to recollect the main proposals of a convention, a treaty or an international instrument on preparedness and response to pandemics. We classified the proposals into four categories: technocratic arrangements; transparency and control mechanisms; coercive powers; and mechanisms for political coordination. We defined as main proposals those which were found repeatedly throughout diverse working documents as well as in the reviewed literature. We also defined as main proposals those deemed innovative for the institutional evolution withing the global health framework.

Discussion and Main Results

During the covid-19 pandemic, measures taken by national States had an inequitable impact on on the health and welfare of vulnerable populations. Apart from these inequalities, even with the implementation by WHO of initiatives for the promotion of access to health technologies, such as the ACT and the COVAX Facility, the vaccines doses rested concentrated in developed countries. It was called “a moral catastrophe and a sanitary apartheid”. This situation could lead the world into other epidemic outbreaks. In order to avoid this scenario, we proposed that WHO needs “teeth” to demand Member States to strengthen vigilance and establish a series of independent evaluations as well as new mechanisms for the declaration of global health emergencies and the establishment of periodic review such as those of the human rights system. At the same time, WHO could adopt sanctions against States that fail to comply and create a Global Council on Health Threats.

Conclusions

In order to guarantee a human rights approach to the system of preparedness and response to pandemics, there needs to be political engagement. At the national level, Member States need to commit to implementing best practices and polices to protect their population against health threats whilst adopting measures that minimize social, economic and health effects on vulnerable individuals. On the global level, States need to comply with internationally recognized rules and decisions agreed upon in common grounds in global for a, such as the WHO or another Global Agency. Transparency and accountability to those regulations could support security of every society, including those most burdened by vulnerabilities.

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The Impact of COVID-19 Pandemic, Related Protective Measures (Containment), Environmental Change and Variation on the Emergency Demands: Results Based on 107,066 Primary Missions in Switzerland

Séverine Vuilleumier[1], Assunta Fiorentino[1], Sandrine Dénéréaz[2], and Thierry Spichiger[2]
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The COVID-19 pandemic impacts not only the COVID-19 patients but also the patients seeking emergency help due to other health issues. Besides, climate changes and environment conditions increased seasonality in emergency demands. Also, the role of paramedics, which is initially to respond to vital emergency situations, now must face new emergency demands. To better understand this transition in prehospital activities, it appears necessary to perform a detailed comparative analysis of missions, typology, and severity of cases encountered. The aim of this study is to delineate the impact of the COVID-19 pandemic, related protective measures (containment), environmental change, and variation on the emergency demands to provide recommendations on the allocation of prehospital resources. Statistical analysis of 107,066 ambulance primary emergency missions during the years 2018, 2019, and 2020 (n=107,066) in the State of Vaud in Switzerland. Variables analyzed were the number of missions, patient age and gender, health issues (33 categories), the severity of cases encountered (NACA scores), and mission time and locations. Our results quantified the difference in health issues, severity, and the patient population before and during the outbreak and identified the consequences of COVID-19 on paramedic missions as well as potential collateral effects. Comparative analysis is performed month by month. The results describe the primary missions in the State of Vaud in 2018 and show in particular that around 87% of missions are "non-urgent". Over half of patients are 65 or older, and only 23% of missions are for traumas. Most missions take place between 7:00 am and 6:00 pm (67%), and around 12% of missions lead to the non-transport of the patient. COVID-19 pandemic waves significantly increased health issues such as respiratory issues, and confinement decreased the number of trauma and intoxication significantly while a significant increase in the number of cases of allergy is measured through time. COVID-19 pandemic, containment, as well as environmental variations impact emergency demands. Reflecting upon their role in emergency demands appears necessary, as well as the related prehospital resource allocation and paramedics' skills to respond to the current needs.

The Impact of the COVID-19 Pandemic, Related Protective Measures (Containment), Environmental Change and Variation on the Emergency Demands: Results Based on 107,066 Primary Missions in Switzerland

Authors

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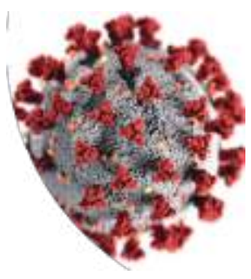


Background

The COVID-19 pandemic impacted not only the COVID-19 patients but also patients seeking pre-hospital emergency help due to other health issues.

The Aims

- Delineate the impact of the COVID-19 pandemic, related protective measures· (containment), environmental change and variation on the prehospital· emergency demands.
- Identify differences in health issues, severity and the patient population before and during the outbreak and identify potential collateral effects.

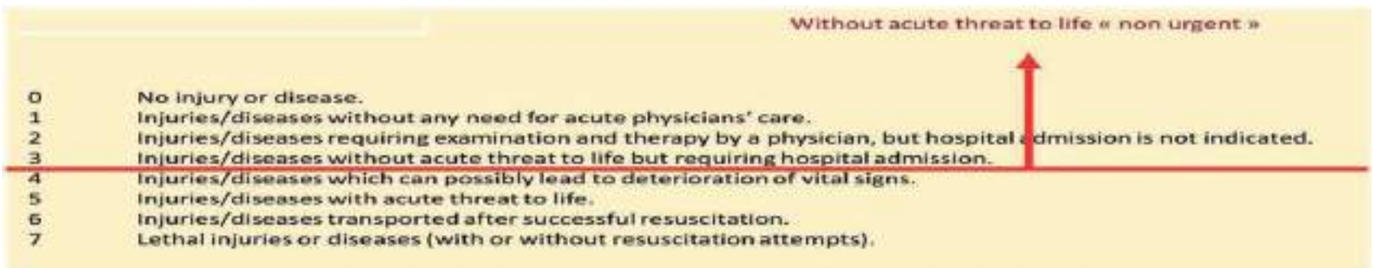
Methods

Statistical analysis of 107,066 ambulance primary emergency missions during the years 2018, 2019 and 2020 in the State of Vaud in Switzerland

Variables:

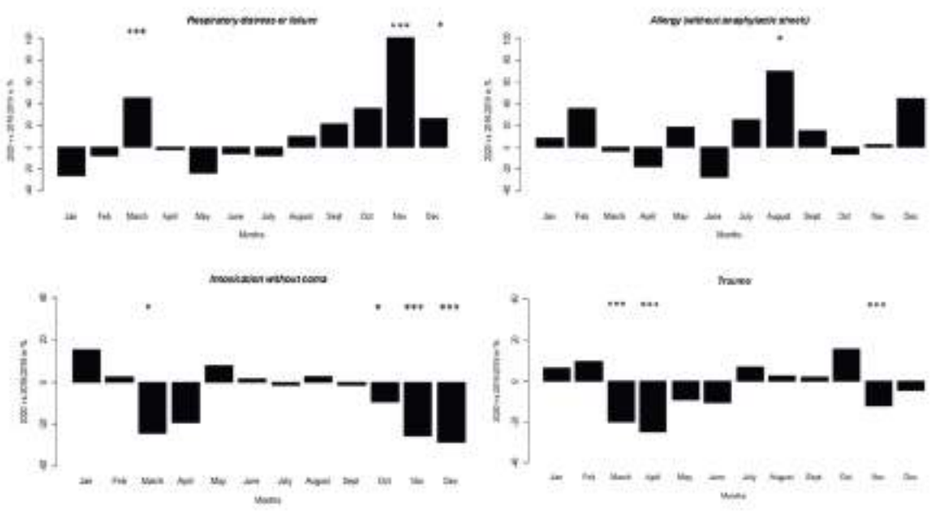
Age	Gender	Time
Severity	Health issue	Location

NACA score: National Advisory Committee for Aeronautics Score



Results

- In total, 87% of missions are "non-urgent".
- Over half of patients are 65 or older.
- Most missions takes place between 7:00 am and 6:00 pm (67%).
- Around 12% of missions lead to the non-transport of the patient.



- COVID-19 pandemic waves significantly increase health issues such as respiratory issues (more than 100% increase).
- Confinement significantly decreased the amount of trauma (around 30%) and intoxication (around 30%) while a significant increase in number of cases of allergy is measured through time.

Conclusion

The COVID-19 pandemic, containment, and environmental variations significantly impacted emergency demands during the pandemic.

Engaging Urban Health Champions for Promoting Healthy Lifestyles and Preventing COVID-19 among Urban Under-Settlement Communities in the Colombo District of Sri Lanka: An Initiative by the Estate and Urban Health Unit of the Ministry of Health, Sri Lanka

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Nearly 4-7 million (18%-30%) Sri Lankan population reside in the urban sector spanning 64 Municipal and urban council areas. Most urban people are clustered in under-settled communities with high population density, low living conditions, and poor health indicators. These socio-demographic characteristics challenge the health of these communities. Also, urban under-settlement areas faced the highest COVID impact. Focused interventions are needed to improve their health and promote healthy lifestyles. Urban Development Authority (UDA) of Sri Lanka aims to relocate these communities to settlement flats by 2030, particularly in the Colombo district, as it has the highest urban population. Currently, nearly 13,000 families are relocated to 21 settlement flats in the Colombo district. The estate and urban unit, together with Colombo Municipal Council and UDA, initiated the Urban Health Champion model project in these flats. Objectives were to mobilize urban community groups to promote healthy lifestyles and to prevent the spread of COVID-19 among these communities. All managers, health instructors, and Public Health Midwives serving in these flats were trained in community engagement and health promotion. Groups of 10-15 urban champions were formed in each flat and empowered to promote healthy lifestyles among themselves and to prevent COVID spread. Health needs assessment and prioritization were done by the groups.

Promoting exercise, preventing public spitting and COVID spread, and community screening for non-communicable disease (NCD) risk factors were prioritized health needs. Activities conducted were: regular risk communication announcements; awareness through religious leaders; community engagement for COVID protection using family checklist; establishment of wash stations; conducting exercise sessions; awareness on banning public spitting and establishment of Urban Wellness Centers for community-based NCD risk factor screening and healthy lifestyle promotion. Urban community group involvement has been shown to be effective in promoting healthy lifestyles and COVID prevention. None of these flats were locked down after starting the project. Regular engagement of health and other service personnel with these groups would be necessary to strengthen the sustainability of this initiative. The urban champion engagement model has shown positive results in promoting health and healthy lifestyles among urban under-settled communities.

Engaging Urban Health Champions for Preventing COVID-19 and Promoting Healthy Lifestyles among Urban Under-Settlement Communities in the Colombo District: An Initiative by the Estate and Urban Health Unit of the Ministry of Health, Sri Lanka

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Introduction

Nearly 4–7 million (18%-30%) Sri Lankans reside in the urban sector. Most urban people are clustered in under-settlements with high population density, low living conditions and poor health indicators. Urban under- settlements faced the highest COVID impact. Focused interventions are needed to improve their health and promote healthy lifestyles. Sri Lanka aims to relocate these communities to settlement flats by 2030. Currently 13,000 families have been relocated to 21 flat complexes in the Colombo district. The Estate and Urban Health unit, together with Colombo Municipal Council and UDA, initiated the Urban Health Champion model project in these flats. The project aimed to mobilize settlement flat champion groups to promote health.

Methods

1st stage: Training of coordinators on community mobilization, engagement and health promotion concepts.

2nd stage: formation of urban champion groups in each flat. Identifying and prioritizing health needs of each setting by coordinators and champion groups.

3rd stage: Conducting community-based activities with the engagement of urban champions to promote healthy lifestyles and prevent COVID-19 spread in each flat complex.

Methods, cont.

Prioritized health needs:

Improving knowledge and skills in preventing Non Communicable Diseases (NCD)

- Promoting healthy lifestyles (e.g., exercise);
- Prevention of public spitting and COVID-19 spread;
- Community-based screening for NCD risk factors.
- Activities conducted within the project:
- Regular risk communication;
- Display of banners and posters on COVID-19 and NCD prevention;
- Installation of wash stations;
- Regular awareness sessions on COVID-19 prevention and healthy lifestyles;
- Regular exercise sessions;
- Establishment of Wellness Centers.

Conclusions

The urban health champion project showed positive results in promoting health and healthy lifestyles among urban under-settled communities.

Cameroonians' Views on the COVID-19 Vaccine

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The pathology known as COVID-19 is an infectious disease that has claimed lives in almost every country in the world, hence the term "global pandemic". Referred to as a "white man's disease", "traveler's disease" or "whiten", it has led to confinements around the world and the introduction of barrier measures to limit contagion. Despite these precautions, the number of deaths has continued to stagnate or increase. Moreover, the virus is mutating. Despite the controversy surrounding the disease and the vaccine's side effects on some people, several countries around the world have considered vaccinating their populations, including Cameroon. However, public attitudes remain mixed. In a comprehensive analysis based on observations, interviews, and case studies in Bafoussam, Douala, and Yaoundé, we not only collected people's views on the COVID vaccination project, but also sought to understand the reasons behind this practice. This exploratory study shows that vaccination is far from being the solution to the coronavirus epidemic. The people interviewed believe that the Cameroonian government should raise awareness of the need to naturally strengthen the immune system, respect barrier measures due to the non-immunizing nature of the vaccine, and make use of proven endogenous knowledge. It is imperative to take into account both conventional medical procedures and local expertise in phytotherapy.

Regards croisés des Camerounais face au vaccin contre le COVID-19

Authors

Jeanette Wogaing and Fabrice Taku Kammou

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Introduction

Les tout premiers travaux sur la pandémie à coronavirus étaient de deux catégories:

- La première sur l'origine du virus, ses manifestations et les processus de contamination chez l'être humain (OMS, 2019; Van Damme et al., 2020);
- La seconde présentée par les médias en général, ne mettait l'accent que sur la rapidité de la transmission chez l'humain (en particulier les personnes âgées) et la perspective biomédicale du traitement (Chan et *al*., 2020).

- À partir du 17 mars 2020, les personnes entrant au Cameroun ont été mises en quarantaine;

- Des mesures gouvernementales ont été prises en vue de limiter la contamination;

- Les sciences humaines et sociales ont été très peu mobilisées; pourtant, elles ont pour vocation fondamentale l'analyse et la compréhension des comportements humains (Gamba et al., 2020; Moungou Mbenda et Ondoua Biwolè, 2020);

- Quelques Camerounais ont mis sur pied des produits qui ont fait leur preuve même si le gouvernement optait plus pour la vaccination des masses (Kleda, 2020 ; Yiagnigni Mfopou, 2020). Par la suite, et ce malgré la maitrise de la maladie par les populations et leur réticence à l'égard du vaccin, l'Etat a envisagé des campagnes de vaccination de masse d'où l'intérêt de cette recherche.

Materiel et Methode

- Comme matériel, nous avons utilisé l'observation et les entretiens auprès d'une cinquantaine de personnes âgées au moins de 20 ans vivant à Bafoussam, Douala ou Yaoundé car ces villes avaient été qualifiées de « foyer de contamination » au regard des statistiques officielles (Ministère de la santé publique, 2020);

- L'analyse des données a privilégié la démarche compréhensive et s'appuie sur l'interprétation des discours.

Résultats et discussion

De la conception populaire aux réticences à la vaccination

La perception et le vécu de la maladie sont fort distincts d'une communauté à une autre (Mbonji, 2009; Jaffré et Sardan, 1999). 03 interprétations différentes ont été dégagées:

✓ La première interprétation

- « *Le coronavirus est une affaire des Blancs* » (Informateur, Bafoussam);
- « *Le coronavirus est la maladie des Blancs et des Blanchis* » (Informateurs, Douala et Yaoundé).

✓ La deuxième interprétation

Le déni et donc le refus d'accepter l'existence réelle de la Covid-19:

- *« On dit qu'il y a des morts ; qu'est-ce qui prouve que les cas déclarés sont vrais ! Comme on est en mode Covid-19, dès que tu pars à l'hôpital, on dit que tu as Covid-19 [Éclats de rires]»* (Informateur, Douala).

✓ La troisième interprétation

- Associer l'apparition de l'infection à une punition divine;
- L'idée de la sanction céleste reste soit discutée voire nuancée, soit circonscrite à des espaces géographiques précis parmi lesquels l'Europe et l'Amérique;
- *« La Covid-19 vient changer l'ordre des choses. […] nous subissons parce que ces choses veulent s'installer dans nos pays*.» (Informateur, Bafoussam);
- *« La Covid-19 serait une divine sanction contre les comportements perçus comme pervers ou contre nature »* discours recueilli par Bonono Momnougui (2020 : 24) quelques mois plus tôt à Yaoundé;
- Dieu n'est pas à l'origine du mal, il laisse faire pour punir celles et ceux qui veulent se substituer à Lui et qui valorisent les actes contre nature (l'homosexualité, la zoophilie, nécrophilie, etc.);
- La polémique observée auprès des personnalités mondialement connues a elle aussi, contribué à semer le doute dans l'esprit des citoyens;
- La controverse constatée au sein même du corps médical;
- La rapidité avec laquelle le vaccin a été mis à disposition

La vaccination au crible des opinions

Tous les informateurs ont avoué savoir l'existence d'un vaccin contre le corona virus.

- *« Que cela prévient le risque d'être infecté par le virus et de développer la forme sévère de COVID-19 si l'on attrape l'infection »* Informateur de Yaoundé

Dans un échantillon résiduel d'une trentaine d'informateurs, seulement 16% ont reconnu s'être vacciné. À l'image de la majorité, le scepticisme développé contre ce vaccin peut se comprendre ainsi:

- « Parce qu'ils n'ont rien d'un vaccin, un vaccin immunise, un vaccin protège de la maladie et un vaccin se développe pendant au moins 10 ans, pas en 3 mois ! » Informateur de Douala.

La vaccinopsychose au Cameroun

- *« Je me suis vaccinée par peur d'être infectée par le corona.»* (Informatrice de Douala);
- *« Mon épouse travaille dans une entreprise où on fait les tests tout le temps. Lasse de voir ses voies nasales être régulièrement traumatisées, elle s'est fait vaccinée. Moi je l'ai fait parce que je voulais aller à l'étranger »* (Informateur de Yaoundé);
- *« Je suis chercheur, je ne pense pas avoir vraiment eu le choix. Si c'était à refaire, je ne le referai pas. […]. Il n'est pas immunisant. J'ai été malade après de Corona. »* (Informateur, Douala);
- La volonté manifeste de vouloir imposer le vaccin aux populations alors qu'il y a des maladies préexistantes « plus dangereuses » que le corona.
- *« Si c'était une maladie naturelle, ce n'est pas en 2020 qu'elle serait apparue. »* (Informateur, Douala);

La vaccination: un choix difficile

Selon les données officielles, seule 3,1% de la population camerounaise est vaccinée (Ministère de la santé publique, 2020).

Pourquoi?

La grosse controverse qu'il y a eu autour du vaccin venant des experts en la matière n'était pas de nature à rassurer. Le doute a été semé dans l'esprit de plusieurs personnes interviewées.

- *« Comment je vais aller me faire vacciner ayant beaucoup de doute dans la tête? »* (Informateur, Douala) ;
- *« Les discours dans les médias locaux et étrangers, et même autour de nous présentaient des personnes vaccinées ayant de nouveau contracté le corona. »* (Informateur, Yaoundé) ;

La fiabilité du vaccin a fait l'objet de plusieurs débats contradictoires.

- *« Si déjà les savants n'arrivent pas à s'accorder pour quelque chose de démontrable, en tant que profane, je ne saurais m'engager. »* (Informateur, Bafoussam) ;
- Malgré l'implication du gouvernement dans la campagne de vaccination, les camerounais semblent ne pas adhérer : *« [à] la pertinence et l'efficacité de cette campagne au détriment de la pharmacopée. »* (Informateur, Bafoussam) ;
- *« Pourquoi s'aventurer à risquer sa santé en allant prendre un vaccin qui est supposé nous prévenir contre la maladie et s'en sortir plutôt avec d'autres maladies ou traumatismes plus redoutables ! »* (Informateur, Douala) ;

La pandémie n'avait pas partout la même ampleur.

- *« En Afrique, on a constaté que les gens pouvaient en guérir en prenant certaines décoctions et recettes locales »* (Informateur, Douala).

- Les points de vue restent très nuancés. On observe qu'il y a un doute persistant quant au pourquoi du vaccin alors qu'il n'a pas un caractère immunisant comme c'est le cas avec la plupart des vaccins proposés dans le Programme Elargi de Vaccination (PEV).

- Le niveau d'études est loin d'être un facteur garantissant l'acceptation du vaccin contre le corona virus.

Une partie importante du personnel soignant n'a pas été à même de convaincre la population.

Conclusions

- Si pour la biomédecine la pandémie à coronavirus est une nouvelle maladie infectieuse, pour les personnes interviewées, la Covid-19 est pour les uns « la maladie des Blancs » parce qu'elle y trouve son origine, et pour les autres « la maladie des voyageurs ». Elle est plus la maladie «des autres ». Même s'il est avéré que la Covid-19 répand la mort, cette pandémie est minorée par les populations.

- Certaines personnes se sont laissées vaccinées pour limiter le stress, pour se déplacer sans trop de contraintes et pour le reste, la vaccination reste un choix difficile ce d'autant plus que cette catégorie opte pour la consommation des produits de la pharmacopée locale.

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One Health Approach for Improving Global Health: A Narrative Review

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The coronavirus disease 2019 (COVID-19) pandemic had a drastic impact on human societies, with public health, food systems, and economic activities under unprecedented challenges. On the other side, animals and nature are also affected by this situation positively and negatively as the biodiversity of the Earth needs all components to support each other. Some animals lost their home and source of food; meanwhile, on the other hand, wildlife also benefitted from less air and noise pollution as an industry, natural resource exploitation, and manufacturing dropped. As for the environment, the lockdown response to COVID-19 has caused a significant reduction in the global economy and transport. However, acts and regulations need to be revised to maintain the health of human-animals-environment globally, as their interactions are the key factor giving rise to this pandemic. Understanding zoonoses is critical in facing the current pandemic as well as preparing the world for the inevitable future outbreaks. The One Health approach will be an important step in linking biodiversity to human health as well as in achieving global priorities. Therefore, our study aims to discuss the impact of COVID-19 on human–animal interaction, the impact of COVID-19 on human-environment interaction, the role of the One Health approach on global health, and post- pandemic transformation on global health. Moreover, this study will provide significant knowledge for the authorities for improvement of policy regarding infectious disease and interaction between human-animals-environment involving hunting, deforestation, selling, and others as preparedness strategies.

A One Health Approach for Improving Global Health: A Narrative Review

Authors

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Introduction

- A One Health approach can significantly improve the overall global health security in response to infectious disease threats which transcend national boundaries.
- This study mainly focuses on the importance of addressing One Health as a concept to improve preparedness for pandemics and global health. Therefore, the concept of One Health together with global health will be further reviewed and explained by further research.

Objectives

- Impact of COVID-19 on the human–wildlife interaction;
- Impact of COVID-19 on human–natural environment interactions;
- Role of One Health approach in global health;
- Post-pandemic transformation in global health

Problem Statement

- What is the impact of COVID-19 on human– animal–environment interactions?
- Can a One Health approach improve overall global health?
- How did COVID-19 impact global health post- pandemic?

Methodology: Primary and secondary sources;

- Database: PubMed, ScienceDirect, EbsCOHOST, PROQUEST, Scopus, Wiley;
- Inclusion: Full article available, between March 2020 to December 2021;
- Exclusion: Papers not in English, inappropriate and not pertinent to study.

Results and Discussion

1. Impact of COVID-19 on human–wildlife interactions

- Trading activities of the wildlife can cause zoonotic spillovers, starting from the phases of hunting, trapping and butchering, transporting, and selling to the consumption phase [1].
- Wildlife as a tourist attraction has positive and negative impacts due to the pandemic, such as increased enrichment of animals, shortage of food, danger in losing homes and increased awareness regarding zoonotic diseases [1].
- Various restrictions during the pandemic led to higher life expectancy of animals by increasing their body mass index and living together with family [2].
- Increased number of animals led to a reduced probability of extinction [3].

2. Impact of COVID-19 on human-natural environment

- Changes in Opportunity

Increase people's available time for other activities, e.g., visiting natural environments in their neighbourhood; however, reduction in time for groups of extremely busy people, e.g., healthcare workers[3]. Opportunity to improve ecosystem: reduce air[4], water, soil [4] and noise pollution[5].

- Changes in Capability

Reduction of the capability of people to interact with nature, e.g., people infected with COVID-19, or people with fear of uncertainties, with a higher prevalence of psychological illnesses[3].

- Changes in Motivation

Increase in motivation to interact with nature, possibly ton compensate for reduced everyday physical activity[6].

3. Role of One Health approach to global health

- Long-term surveillance of interspecies connections through underlying ecological and anthropological data [7]; Identifying regulations applied to a certain area helps the authorities to plan and implement new and improved regulations to reduce the transmission of zoonotic disease to a risk level acceptable to the community in social and cultural aspects [8];
- Integration of a variety of expertise for ecological sustainability [9];
- Physicians should also possess the skills and essential competencies to enable them to comprehend, cooperate and advocate for the sake of systemic change [10];
- Urban land-use planning or village models should be studied and applied to help lower human density and avoid saturating an ecosystem [11];
- Veterinary colleges must continue to make strenuous attempts: increased recruiting efforts, employment of faculty members from more varied backgrounds and specialties, and curriculum adaptation [12].

4. Post-pandemic transformation in global health

- Civil society actors, health professional groups, and people who believe in the fundamentals of health will all need to rethink and reinterpret their roles in this pandemic-torn terrain [13];
- Comparable epidemiological models were utilised to predict transmission and guide intervention measures [13];
- Encouraging agencies to work together more closely to promote healthy agriculture, promoting healthy diet, restoring and increasing land and water resources that sustain natural biodiversity [9];
- Changes must be made in regulatory institutions and people's attitudes regarding the welfare of food animals and their consumption [14];
- With the assistance of international financial institutions, existing safety net programmes to support poor people's incomes and food security can be expanded [15];
- Susceptibility of the world's food security calls for reformation to perpetuating inequalities through One Health incorporation into Global Health Security [15].

Conclusions

- There is stabilization between positive and negative impact of pandemic COVID-19 towards human-animals-environment interaction
- One health promotes collaboration of multi-disciplinary expertise to improve global health security

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The Awareness and Knowledge of Climate Change and Zoonotic Diseases: A Pilot Study

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Climate change indirectly influences the emergence and re-emergence of zoonotic diseases and becomes a global issue. Humans are responsible for the existence of this interaction, and their inattentiveness and greed exacerbate this issue. A pilot study was conducted to observe the awareness and knowledge of the interaction between climate change and zoonotic diseases among university students in Malaysia. An online survey was distributed to all university students in Malaysia through Google form. It consisted of qualitative and quantitative questions related to climate change and zoonotic diseases. There were 186 respondents, and most of them were degree students who participated in this survey. A total of 114 (61.3%) of them are aware of the relationship between climate change and zoonotic diseases, and 176 (94.6%) respondents agreed that zoonotic diseases could be introduced to humans due to climate change. In addition, 75.3% of respondents think that their social circle also believed that climate change and zoonotic diseases were serious problems. This survey proved that the majority of respondents are aware of and have good knowledge regarding the relationship between climate change and zoonotic diseases.

The Awareness and Knowledge of Climate Change and Zoonotic Diseases: A Pilot Study

Authors

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Abstract

Climate change indirectly influences the emergence and re-emergence of zoonotic diseases. Humans' attitudes are responsible for the existence of this interaction. A pilot study was conducted via the distribution of an online survey to observe the awareness and understanding of the interaction between climate change and zoonotic diseases among university students in Malaysia. There were 186 respondents who participated in this survey, and 114 (61.3%) of them were aware of the relationship between climate change and zoonotic diseases. A total of 75.3% of respondents thought that their social circle also believed that climate change and zoonotic diseases are a serious problem. This survey proved that the majority of respondents are aware and have good understanding of the relationship between climate change and zoonotic diseases.

Introduction

Climate change has been indirectly impacting both human and animal health and has significantly influenced the emergence and re-emergence of zoonotic diseases. This is because climate change can affect habitats for plants, insects and animals and it is also expected that the ecology and epidemiology of infectious diseases will change (Parkinson et al., 2014).

In 2016, a large outbreak of anthrax disease in Arctic Russian Siberia was caused by high thawing rates that may have led long-buried infected carcasses to surface again [1]. Therefore, zoonotic disease has consistently become a major and burning health concern as it extensively causes millions of deaths each year.

Objective

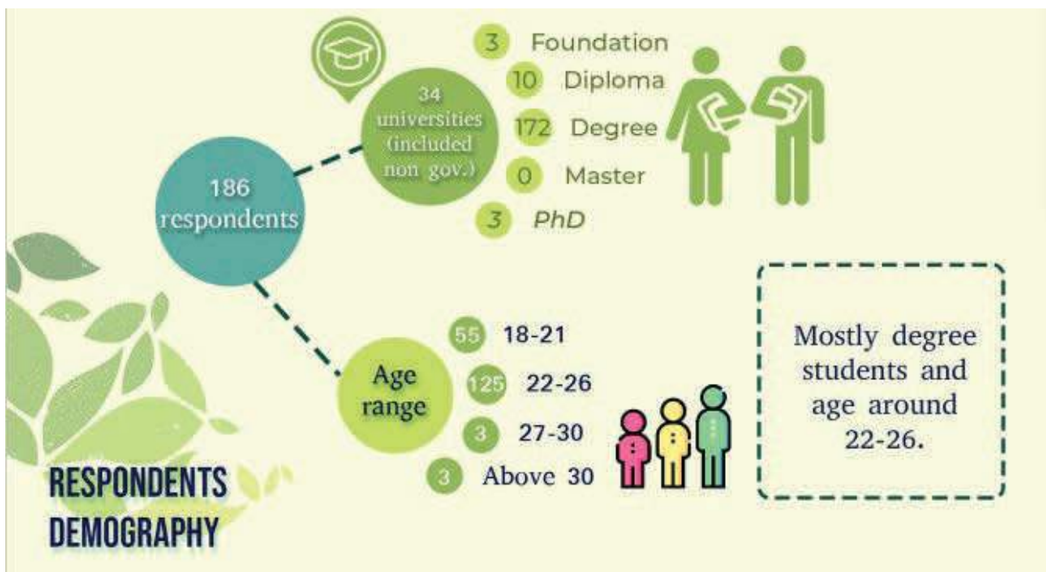
To study the awareness and knowledge of interactions between climate change with zoonotic diseases among university students in Malaysia.

Methodology

A cross sectional study conducted by distribution of an online survey on the 4th of February 2022 to all university students in Malaysia asking questions related to climate change and zoonotic diseases. The survey contains three sections consisting of qualitative and quantitative form questions. Inclusion criteria are:

Primary qualitative data collected: A few subjective questions were given for a more in-depth understanding and to observe respondents' opinion about study topic.

Primary quantitative data collected: A collective question was testing general knowledge of climate changes and zoonotic diseases that is happening nowadays.

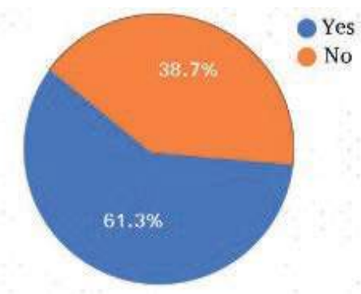


Qualitative

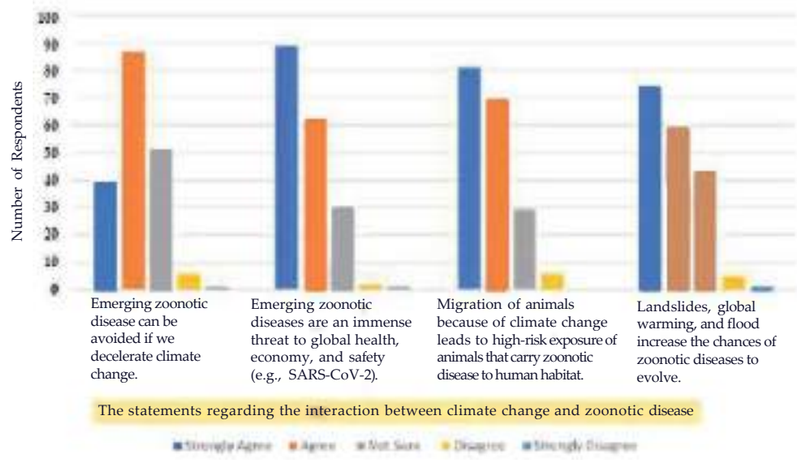
50% of respondents believe climate change can be completely solved via technological advancements and continuous human discovery. Another half of respondents mention that it is impossible to completely solve the problem because they believe recovery from climate change and its effects is a long term process. They also agree that unstoppable human greed accelerates climate change.

Quantitative

Respondents Awareness of the Interaction Between Climate Change and Zoonotic Disease



Respondents Agreement toward the Statements Regarding the Interaction between Climate Change and Zoonotic Disease



Discussions

- The questions that have been constructed for this study act to determine the level of awareness and understanding of the issue.
- 97.3% of respondents acknowledge the definition of climate change because they are currently exposed to global issues related to climate change.
- 61.3% of respondents are aware of this relationship even though the survey was distributed to different academic backgrounds. Despite the result, a previous study conducted in Taiwan reported social science students were significantly more likely to report higher levels of concern [2].
- Furthermore, researchers acknowledge that respondents' social circle are concerned about this issue. Hence, it is implied that this problem is of significance to more than just university students.
- However, as this study was conducted randomly with a varied number of respondents assigned to each category, the researchers are unable to identify the highest degree of awareness and understanding in these categories, regardless of current education level or age range.

Conclusions

Nowadays, there is emergence of a variety of zoonotic diseases that are influenced by climate change and have become global issues. After the survey was done, we concluded that the majority of respondents are aware and have good understanding of the relationship between climate change and zoonotic diseases. To recapitulate, with this discovery, everyone can begin to increase their efforts to educate and expand their knowledge to every corner of the world. Hence, there is a potential to continue this research in a wide range of subjects and to distribute them to all Malaysia university students.

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