J Med Biosci Suppl 2024;6(1): S1 - S55 DOI: 10.58837/CHULA.JMBS.6.S1.1

Editorial

As the Editors of this special issue of the Journal of Medical Bioscience, we are delighted to present a curated selection of abstracts from the APRU Global Health Conference 2024, held from November 4-6 in Bangkok, Thailand. Co-hosted by the School of Global Health, Faculty of Medicine, Chulalongkorn University, and the Association of Pacific Rim Universities (APRU), this year's conference brought together researchers, practitioners, students, and policymakers under the theme, "Harmonizing Human and Planetary Health Through Innovation, AI, and Digital Transformation".

The abstracts compiled in this special collection reflect the diversity and depth of the innovative research presented at the conference. From studies in artificial intelligence and digital health to addressing pressing challenges in climate change, infectious diseases, mental health, and non-communicable diseases, the breadth of topics underscores the global commitment to advancing health equity and sustainability.

Highlights from this edition include research on; Digital and AI Health Interventions: Studies showcased advancements in leveraging artificial intelligence for predictive healthcare, digital health, and human-centered approaches to healthcare across all populations, including geriatric, pediatric, marginalized communities, and gender-diverse individuals.

Environmental Health and Climate Resilience: Innovative solutions addressing health risks posed by climate change, pollution, and sustainable healthcare systems were prominently featured, offering valuable lessons for mitigating planetary health crises.

Mental Health Innovations: Research exploring digital mindfulness programs, immersive virtual reality applications for pediatric cancer care, and socio-behavioral insights into mental health interventions demonstrated the evolving role of technology in improving mental well-being.

Global Health Education and Ethics: The conference emphasized capacity-building initiatives, cultural sensitivity in health education, and ethical considerations in global health research, reflecting a collective effort to bridge knowledge gaps and foster equitable health outcomes.

These abstracts provide not only a snapshot of impactful global research but also a testament to the collaborative spirit that defines the APRU community. The insights and methodologies presented hold the potential to shape global health policies and practices in meaningful ways.

We extend our gratitude to the authors, reviewers, and conference organizers for their contributions to this remarkable event. By sharing these abstracts with the broader scientific community, we aim to inspire continued dialogue, collaboration, and innovation in tackling the complex health challenges of our time.

We hope that this collection serves as a valuable resource for researchers, educators, students, practitioners, and policymakers dedicated to the advancement of medical innovation and global health. Together, let us strive toward harmonizing human and planetary health for a sustainable future.

Sincerely,

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Evaluation of maternal death surveillance system in Depok City, West Java Province in 2023

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Background: The target maternal mortality rate (MMR) in Depok City in 2023 is 58.30 while the MMR ratio is 66.40 per 100,000 live births. Based on this data, the MMR in Depok City has not reached the target.
Description: This observational study used a descriptive approach and was conducted from April to June 2024. Data were collected by conducting in-depth interviews with the Person in Charge (PIC) of Family Health at the Health Office, 4 PICs of Maternal and Child Health at the Puskesmas, 3 PICs of the Obstetrics Room at the Hospital, 1 PIC at the Independent Practice Midwife, observing Maternal and Child Health reports at the Puskesmas, and observing Maternal Death reports through the Maternal Perinatal Death Notification (MPDN) Application. The aspects evaluated were components of the structure, main functions, supporting functions, and attributes of the surveillance system referring to the WHO Surveillance System Evaluation and Maternal Death Surveillance and Response (MPDSR) Guidelines. Data are presented in tables, graphs, and narratives.
Lessons Learned: The main cause of maternal mortality was hypertension in pregnancy at 28%. For the structure component, 56% of respondents did not know the legal aspects of maternal death surveillance, for the main function component, 56% were not correct in defining maternal death cases correctly, 50% were incomplete in recording, the supporting function component, 78% of respondents did not have MDSS guidelines.
Next Steps: The implementation of MDSS is still far from good. Therefore, it is important to provide training to health workers on each component of the latest MDSS and ask the local government to issue a decree on the implementation of MDSS as well as make Standard Operating Procedures in each health facility related to maternal death case reports. Early detection of the risk of hypertension in pregnancy is by diligently conducting quality ANC for pregnant women.

Development of a composite measure of overall health status: prospective exploratory validation in Brunei Darussalam

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Background: According to the World Health Organization (WHO), 74% of deaths are due to non-communicable diseases (NCDs) worldwide [1]. Reducing modifiable risk factors, together with early screening and treatment, is the most effective way to control the growing burden of NCDs [1-3].
Objectives: To develop and validate a composite health score, called "Health Index" that acts as a measure of health at an individual and national level. It can be used to improve users health literacy, thereby improving overall health behaviours for more positive health outcomes.
Methods: Participants were invited to the study through the national mobile health application in Brunei Darussalam, called "BruHealth". They were asked a series of basic demographic questions followed by physical health and lifestyle questions. Health Index would be generated to assess participants' health status, categorizing them as either healthy, at-risk, or in poor health. NCDs-related healthcare utilization, which included inpatient stays, outpatient visits, emergency visits, and medication prescriptions in the past 1 year were used as the outcome measure to validate Health Index. They were combined as a single variable as follows: "1y_combined_score"=(ln??("1y_ncd_healthcare_utils+1")?(max(ln??("1y_ncd_healthcare_utils")?))+"1y_ncd_med_score")/2
Results: A total of 2,165 users participated in the study with a median age of 35 years old (range: 17-80 years old), and the male to female ratio of 1:1.49 (Table 1). The median score was 70 belonging to the "at- risk" category (range: 26-100). There was a decreasing trend in the combined score as the health index score increases. A one-way ANOVA followed by post-hoc Tukey's HSD test revealed that there was statistically significant differences in the combined scores between healthy, at-risk and poor health groups.
Conclusions: Health Index successfully identified frequent users of healthcare services by categorising them into healthy, at-risk and poor health. Health Index can be applied for health tracking at individual and national level, but requires further prospective validation.

Exploring the efficacy of mobile technologies in managing care for HIV exposed children in Eswatini

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Background: The population of HIV-exposed uninfected (HEI) children expands rapidly. However, mother-to-child transmission of HIV remains a global health challenge despite being largely preventable. Mobile technology has been increasingly adopted by humanitarian programs worldwide, for better programmatic design and improved monitoring and evaluation of programs. Phila Unotse project implemented by Young Heroes Organization supports the government of Eswatini to prevent new HIV infections and reducing the HIV vulnerability among young children where

as part of the targeted population groups are HIV Exposed Infants tracked through Commcare mobile.

Description: Secondary data analysis of routine data collected from January 2023 to September 2023 within ongoing implementation of Phila Unotse project was explored. Trained Community Health workers cal identify HIV exposed children, provide consent to identified caregivers for enrollment into the project and provide health support to ensure that children stay HIV negative until end of exposure. An electronic appointment tracker (Commcare mobile application) for HEIs is maintained. Monthly, HVs review the online tracker to identify HEIs due for testing and provide follow-up and support to caregivers. HEIs who missed clinic appointments are visited and issued with referrals within 3 days.

Lessons Learned: 399 HEIs were tracked over the 9 months period. In the first quarter of the year, HEI tracking was 100% with 99% HEIs testing HIV negative and 1 testing HIV positive and 0% missed appointment. The second quarter maintained 100% tracking, 99% HEI testing HIV negative and only 1 tested positive and was linked on treatment. In the last quarter,the project maintained 100% tracking rate with 0% missed appointments and all HEIs were on track.

Next Steps: Commcare mobile application offers emerging solutions to support HIV prevention and keep HIV exposed children safe and healthy. Active tracking and support for Caregivers of HEIs ensured that they honor their scheduled clinic visits and kept exposed children.

Patterns of detection and treatment of mental health problems among women Overseas Filipino Workers (OFWs): implications to psychosocial support services

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Background: This study aimed to analyze the patterns of detection and treatment of mental health problems among women Overseas Filipino Workers (OFWs) and derive from the findings the implications to psychosocial support services.

Objectives: (1) Determined how women OFWs can contribute positively to the economy; (2) Described how mental health problems among women OFW applicants are detected by the DOH Pre-Employment Medical Examination (PEME); (3) Analyzed the responsiveness of the processes, services and practices to the women OFW mental health needs; (4) Identified the psychosocial factors that affect women OFWs' well-being at Pre-deployment, Employment, and Return stages; and (5) Recommended psychosocial support services that the government, NGOs and relevant agencies can implement to address women OFWs' mental health problems.

Methods: OFW experiences during their overseas employment were described and analyzed using Thematic and Kruskal Driver Analyses.

Results: The study found that aside from their contribution to Philippine economy, the work of women OFWs contribute to the economic development of their countries of work. What is more appropriate to migrant work is psychosocial evaluation that can measure readiness for overseas work which includes indicators of multicultural, socio-economic, emotional and psychological attributes. There is interconnectedness and flow of support for mental health systems that can prevent and address mental health problems but there is room for improvement to make it more systematic. The major stressors to women OFW mental health have been identified in this study.

Conclusions: The psychosocial factors that affect OFW well-being vary by country of work due to Work environment, Job content, Organizational condition, Workers' capacities, needs and culture, and Personal conditions. Remittance inflows to the Philippines can be managed better to benefit the women OFWs' families. A psychosocial evaluation that can measure multicultural, socio-economic, emotional and psychological attributes can be designed and utilized at the early stage of application for overseas work.

A deep learning model for neuroblastoma diagnosis from plasma and urine metabolites tolerant to missing data

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Background: Neuroblastoma (NB) is a cancer of sympathetic nervous system origin that accounts for 15% of childhood cancer deaths worldwide. Its nonspecific initial symptoms underlie a challenge in early diagnosis. Current diagnostic methods, albeit with limited accuracy, rely on measuring Homovanillic acid (HVA) and Vanillylmandelic acid (VMA) levels in urine. Several studies have demonstrated that direct derivatives of catecholamines or precursors of HVA and VMA – normetanephrine, metanephrine, and 3-methoxytyramine – are more promising biomarkers. While using variables in combination may improve the diagnostic performance and reveal additional tumor characteristics, it is not common for all patients in the cohort to have data of all 5 compounds or tumor features including stages or localization.

Objectives: This project aims to develop a deep learning model robust to missing data for learning relationships between urinary and plasma metabolites to predict neuroblastoma and tumor location.

Methods: The model was trained on 137 subjects. The model architecture incorporates a self-attention layer in the encoder to learn variable interactions and passes a latent

representation into 3 outputs: input reconstruction, diagnosis, and tumor localization. The loss functions are designed to omit missing data. Performances between training configurations are compared via 5-fold cross validation on subsets grouped by soft clustering.
Results: The difference between using only valid data and including missing data is not significant, but the latter yields the best individual result. Fully trained model shows a PR-AUC of 1.0 for diagnosis and 0.769 for tumor location.
Conclusions: This study demonstrates the effectiveness of a deep learning model in diagnosing NB and predicting tumor location using urinary and plasma metabolites. These promising results suggest that this approach of accommodating missing data could enhance future early detection by improving data utilization. Further validation on larger datasets and prospective clinical studies are needed to confirm the model's generalizability and real-world impact.

Developing strategies for preservation and transmission of indigenous medicinal knowledge across generations In Karen Communities in Northern Thailand (Well Being Herbal Ceremonial Centre)

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Background: The Karen Indigenous people in northern Thailand (PASD) are working with scholars at Simon Fraser University to protect the biodiversity in their territory, particularly with regard to traditional herbal medicines. The project is one component of the Arramat Project (https://arramatproject.org/), funded by the New Frontiers in Research Fund (https://www.sshrc-crsh.gc.ca/funding-financement/nfrf-fnfr/transformation/transformation-eng.aspx)
Objectives: This study aims to explore opportunities to develop inter-generational methods for Indigenous communities to use to facilitate the transmission of medicinal knowledge to younger generations. The project has three sub-objectives:1. To work with the Karen community of Mae Lan Kham, Thailand to document traditional medical knowledge in their community, and to develop opportunities for this knowledge to be stored and shared in the community according to community protocols, 2. To recruit and train youth and elders from the community to participate in the project as community research assistants, and 3. To support PASD to re-vitalize the Indigenous research network in southeast Asia through opportunities to bring Healers and youth from other Indigenous communities to Thailand to learn about the project.
Methods: The project has engaged and trained community youth to work with Karen Knowledge Keepers and Healers in the community of Maw Lan Kham in northern Thailand. They have engaged in community-based ethnographic work to document (interviews, storytelling and photographs) medicinal knowledge.
Results: The research Team has identified over 250 plants to date that are used in Karen traditional healing associated with different seasons and the rotational farming schedule. The Team has also worked with the community to revitalize a traditional Ceremonial Centre (Blauf) in the community which will function as a "Living Library" for future generations.
Conclusions: The project is also serving as a case study for the Arramat Transformation Pathway "Nurturing Indigenous Medicine and Health Care", which is partnered with more than 30 similar projects in Indigenous Territories globally.

Medication annotation using SNOMED-CT and FHIR for Thai discharge summary notes

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Background: The use of stadardized medical terminologies like SNOMED-CT and FHIR in clinical documentation enhances the interoperability of healthcare data. This study focuses on developing a detailed medication annotation guideline tailored for Thai discharge summary notes which is crucial for clinical natural language processing tasks, as it provides a gold standard for evaluating the performance of machine learning models.
Objectives: To create and evaluate an annotation framework for medication prescriptions in Thai discharge summaries using SNOMED-CT and FHIR standards.
Methods: We collected 90 discharge summaries from Maharaj Nakhon Chiang Mai Hospital, spanning from 2018 to 2022. The data was randomly split into training (70 summaries) and validation sets (10 summaries). Three general physicians were trained to annotate the dataset using INCEpTION v32.1 software, following a custom guideline adapted from Schulz et al. (2024). Annotations included semantic tagging of medications, dose forms, dose quantities, routes, and timing, focusing on post-coordinated concepts. The annotation process involved zero-width annotations for specific cases and allowed overlapping and subcharacter annotations. Inter-rater reliability was measured using Krippendorff's alpha.
Results: The inter-rater agreement among the three

physicians was high, with Krippendorff's alpha scores of 0.82 for concept-level annotations and 0.96 for relation-level annotations.
Conclusions: Our study successfully developed a comprehensive annotation guideline for medication prescriptions in Thai discharge summaries. The high inter-rater reliability demonstrates the guideline's effectiveness, suggesting its potential for broader application in Thai clinical documentation.

Associations between economic status and health insurance ownership with basic immunizations status of infants in Indonesia
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Background: Immunization prevents at least 2 to 3 million deaths each year (WHO, 2019). However, around 19.7 million infants worldwide do not receive basic immunizations, with 60% of them living in Angola, Brazil, Congo, Ethiopia, India, Nigeria, Pakistan, Philippines, Vietnam, and Indonesia (WHO, 2020). Not getting immunized can raise a person's risk of contracting diseases, particularly immunization-preventable diseases. In 2019, over 5.2 million fatalities among children under the age of five were attributed to preventable causes, one of which was immunization-preventable diseases, and Indonesia is one of the ten countries with the greatest number of child deaths under the age of five.
Objectives: This study aims to determine the associations between economic status and health insurance ownership with the completeness status of basic immunizations of infants in Indonesia.
Methods: This study used the 2017 IDHS data with a cross-sectional study design. The sample of the study was 3386 children aged 12-23 months and was being analyzed using univariate and bivariate analyses.
Results: The prevalence odds of incomplete basic immunizations status were 1.99 times higher in infants with the lowest economic status (POR 1.99; 95% CI 1.60-2.47) and 1.60 times higher in infants with the lower middle economic status (POR 1.60; 95% CI 1.26-2.01). Then, the prevalence odds of infants having incomplete basic immunization were 1.31 times higher if their parents did not have health insurance (POR 1.31; 95% CI 1.14-1.52).
Conclusions: There are significant associations between economic status and health insurance ownership with the basic immunization status of infants in Indonesia.

Risk factors of large for gestational age among pregnant women with gestational diabetes mellitus: a systematic review and meta-analysis
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Background: Patients with gestational diabetes mellitus (GDM) are more likely to give birth to infants that are large for gestational age (LGA), due to abnormalities in glucose and lipid metabolism. Although previous studies have explored the risk factors for LGA delivery in GDM patients, the results are quite different and still lack of unified understanding.
Objectives: To explore the elements linked to LGA delivery in GDM patients, and thus provide reference for medical staff to formulate relevant clinical interventions.
Methods: Systematic search of seven databases (PubMed, Scopus, Cochrane Library, Web of Science, EMBASE, OVID and CINAHL) was undertaken between the inception of the database to 15 July 2024. Quantitative studies published in English were included. Two authors independently screened the literatures and evaluated the quality of the studies using the Joanna Briggs's Institutional (JBI) Critical Appraisal Tools. The pooled effect size was estimated using the odds ratio (OR), and the corresponding 95% confidence interval (CI) was calculated. To ensure the reliability and stability of the results, Q test and I2 test were also used to identify the heterogeneity between studies.
Results: A total of 18 studies with 9 risk factors were included. The significant risk factors were parity (OR 2.1, 95%CI 1.4-3.1), abnormal fasting blood glucose (OR 2.91, 95%CI 1.33-6.36), 2h OGTT measures (OR 1.51, 95%CI 0.74-3.95), maternal overweight/obesity (OR 2.18, 95%CI 1.47-3.25), excessive gestational weight gain (OR 2.02, 95%CI 1.40-2.91), glycated albumin (OR 1.61, 95%CI 1.24-2.10), fructosamine (OR 1.45, 95%CI 1.19-1.78), HbA1c (OR 3.62, 95%CI 1.12-11.69) and TG (OR 1.419, 95%CI 1.173-2.453). The sensitivity analysis shoewd that the pooled estimates were stable.
Conclusions: Effective interventions targeting the above factors may reduce the risk of LGA delivery in GDM patients and improve the clinical outcome of patients. Further prospective studies are needed to confirm these findings.

Social participation and depression trajectories among middle-aged and older women in China: the role of offline and online activities
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Background: Middle-aged and older women tend to report higher rates of depression than their male counterparts in China. However, previous studies have primarily focused on the depressive trajectory of the whole aging sample without considering gender and have explored the role of social participation as an intervention. It should be noted that in the digital age, middle-aged and older women are increasingly participating in online activities. Therefore, it is pertinent to assess the effectiveness of social participation as an intervention for depression by distinguishing between online and offline activities.

Objectives: The study aims to: (1) identify depression trajectories among middle-aged and older women in China; and (2) assess the impact of social participation (both online and offline) on these trajectories.
Methods: The study utilized data from the China Health and Retirement Longitudinal Study 2015-2020, tracking women aged 45 years and older to identify depression trajectories through group-based trajectory modeling (GBTM). A multinomial logistic regression model was employed to analyze the impacts of online and offline social participation on these trajectories.
Results: Four depression trajectories were identified: stable low, slower growing, faster growing, and stable high. Offline social participation was associated with lower odds of entering the stable high or faster- growing depression trajectory. The association between online social participation and depression trajectory became non-significant when controlling variables such as residence, education level, self- rated health, and family connections.
Conclusions: Overall, social participation can effectively intervene in the depression trajectory of middle-aged and older women. Encouraging these women to engage more in offline activities is an effective strategy for improving depression. Further exploration is needed to understand the role of online social participation, especially when considering data from samples with greater exposure to online activities.

Does worry about mental health issues relate to inadequate mental health services? an international perspective

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Background: Despite the increasing awareness of mental health issues, many countries face challenges in providing accessible, high-quality mental health care.
Objectives: This study examines the association between mental health services and the public's worry about mental health across different countries. The study has three main hypotheses: (1) greater availability of mental health services is associated with less worry about mental health issues across different countries; (2) better quality of mental health care is associated with less worry about mental health issues across different countries; and (3) higher prevalence of mental disorders is associated with more worry about mental health across different countries.
Methods: This study used data from the Lloyd's Register Foundation 2021 World Risk Poll (WRP) powered by Gallup, the Organization for Economic Co-operation and Development (OECD), the World Health Organization (WHO), and Our World in Data (IHME, Global Burden of Disease). The variables include the public's level of worry about mental health, mental health services (i.e., service facilities, service availability, and service utilization), and estimated prevalences of major mental disorders.
Results: The results suggested that greater availability of mental health outpatient facilities was associated with less worry about mental health across countries. However, no significant association was observed between other service variables such as service utilization and worry about mental health. Additionally, results regarding associations between prevalences of various mental disorders and worry about mental health were mixed.
Conclusions: This research highlights the importance of mental health outpatient facilities in alleviating public worry about mental health issues. The findings also suggest the importance of increasing the availability of these facilities to ensure greater accessibility of essential mental health care, thereby improving mental well-being across countries.

The relation of Epstein-Barr virus seroprevalence among children with economic status and healthcare quality

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Background: The Epstein-Barr virus (EBV) infects 90%–95% of the global population, with the trend of EBV infection differing between countries. As EBV vaccines are under development, summarizing and synthesizing relevant information may be useful for future vaccine policy.
Objectives: This study examined the seroprevalence of EBV among children in the last 20 years and analyzed its relationship with economic status and healthcare quality.
Methods: The seroprevalence information of EBV among children in the last 20 years was obtained from 16 studies systematically screened from the PubMed database. The information about economic status represented by the gross domestic product per capita was retrieved from the World Bank national accounts data and the Organization for Economic Cooperation and Development national accounts data files. The healthcare quality data represented by the infant mortality rate was retrieved from the United Nations Inter-agency Group for Child Mortality Estimation. Apart from descriptive data from these open sources, we analyzed

the relationship using linear regression in SPSS version 29.0.0.0.

Results: Overall, the results illustrated that the seroprevalence of EBV increased with age. The detection of antibodies in 5-year-old children mainly was more than 50% and often rapidly increased to over 75% by ages 10–15 years and to over 90% in adults. Most studies showed an early increase in EBV infection in developing countries and a late increase in developed countries. Regarding economic status, the age at 50% and 75% EBV seroprevalence significantly increased in the countries with higher economic status (R^2 = 0.851, P <0.001 and R^2 = 0.395, P = 0.021). Age at 50% and 75% EBV seroprevalence decreased slightly in countries with lower healthcare quality (R^2 = 0.117, P = 0.369 and R^2 = 0.157, P = 0.179).

Conclusions: In the last twenty years, EBV infection has increased with age. An earlier age of EBV infection was related to lower economic status. We suggest administering future EBV vaccines at 6-12 months to potentially prevent EBV infection.

Parents and depressed adolescents in Ghana: a qualitative analysis of family communication

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Background: Depression among adolescents is a growing concern globally, with significant implications for mental health and well-being. In Ghana, the social, cultural, and familial contexts significantly influence adolescents' mental health outcomes. This study explores communication patterns between depressed adolescents and their parents in Ghana, highlighting how these interactions impact adolescent mental health.

Objectives: This study aims to identify specific parental communication styles, emotional responses of adolescents, and alternative support systems that characterize interactions between depressed adolescents and their parents in Ghana.

Methods: An exploratory, descriptive qualitative design was employed, using semi-structured interviews to gather in-depth data from 13 depressed adolescents receiving outpatient treatment in the Greater Accra region of Ghana. Purposive sampling was used to select participants, and data were collected from March 2024 to May 2024. Thematic analysis was conducted to identify recurring themes and patterns in the participants' narratives.

Results: The analysis revealed four primary themes: (1) Parental Communication Styles and Impact, characterized by authoritative communication and lack of understanding; (2) Adolescents' Emotional Responses and Communication Barriers, including fear of parents, communication difficulties, isolation tendencies, and feelings of insecurity, (3) Support Systems and Alternative Communication Avenues, with adolescents finding solace in sibling and peer communication, and (4) Emotional Expression and Mental Health Needs, highlighting the emotional burden of depression and the need for improved communication patterns.

Conclusions: The study underscores the significant impact of parental communication styles on the emotional well-being of depressed adolescents. Addressing these communication patterns through targeted interventions can potentially mitigate adverse effects on adolescent mental health. Future research should focus on developing culturally sensitive interventions to enhance family communication and support for adolescents in Ghana.

Impact of heatwaves and high temperature on morbidity among older adults: a systematic review and meta-analysis

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Background: Heat exposure is associated with increased morbidity, particularly among older individuals. With climate change projected to intensify heatwaves and high temperatures, understanding their impact on older adults is essential for developing targeted interventions.

Objectives: This systematic review and meta-analysis aimed to quantify the effects of heat exposure on morbidity in older adults. We focused on specific disease categories, climate zones, and demographic factors.

Methods: We searched PubMed, Embase, Web of Science, Scopus, CINAHL, and AgeLine for observational studies published from January 1990 to May 2023 that examined morbidity in older adults during periods of high temperatures or heatwaves. A random-effects meta-analysis was used to estimate pooled relative risks (RR).

Results: The meta-analysis included 199 studies. A 1°C temperature increase raised morbidity risk by 1.9% (RR = 1.019, 95% CI: 1.014-1.024), with the highest risk seen in heat-related illness, external causes of morbidity, and endocrine diseases. Tropical climate zones and individuals 85 years and older showed the highest morbidity per 1°C increase. Furthermore, heatwaves increased morbidity by 22.4% (RR = 1.224, 95% CI: 1.167-1.284), with endocrine diseases, external causes of morbidity, and mental health conditions being most affected. The age group of 75-84 years and temperate climate zones exhibited the highest morbidity during heatwaves. Countries with a high-income classification experienced the greatest morbidity risk during

heat exposure.
Conclusions: Heat significantly raises morbidity in older populations. Limited evidence exists on individual factors (e.g., heat-sensitive diseases), as well as local and area factors that place populations at risk. Future research should explore these factors to develop effective mitigation and adaptation strategies to reduce peaks in morbidity during hot spells.

Living arrangements and dietary diversity among Chinese older adults: evidence from the 2018 Chinese Longitudinal Healthy Longevity Survey

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Background: Living arrangements play a crucial role in shaping older adults' dietary habits and health outcomes. However, the association between living arrangements and dietary diversity among Chinese older adults has rarely been investigated.
Objectives: This study aims to investigate this association among individuals aged 60 and over, with a specific focus on urban and rural disparities due to the longstanding economic gap.
Methods: The study used data from the 2018 wave of the Chinese Longitudinal Healthy Longevity Survey (CLHLS). The participants were individuals aged 60 and over with available dietary and living arrangement data. Dietary diversity was defined as 'high' if respondents had a dietary diversity score above the mean value. Living arrangements were classified into four groups: (1) living alone, (2) spouse only, (3) living with at least one great/grandchild, and (4) non-empty-nested. Binary logistic regression was applied to analyze the association between living arrangements and dietary diversity.
Results: on-empty-nested older adults had the highest probability of having high dietary diversity. Those living with a spouse or at least one great/grandchild were also more likely to have high dietary diversity than those living alone. Disparities in dietary diversity between different living arrangements were more pronounced in urban than rural areas. Older adults living alone exhibited the poorest dietary diversity across urban and rural areas.
Conclusions: Living arrangements are significantly associated with dietary diversity among older Chinese adults aged 60 years and over. The findings underscore the need for tailored health interventions that account for living arrangements and residential areas to enhance nutritional outcomes for the Chinese older adults.

Association of dietary diversity with self-rated health across different age groups among older adults: findings from the 2018 Chinese Longitudinal Healthy Longevity Survey

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Background: High dietary diversity has been identified as a protective factor against cognitive decline, chronic health conditions, and mortality risk in older adults. However, research examining its relationship with self-rated health among older Chinese adults remains limited.
Objectives: This study attempts to investigate the relationship between dietary diversity and self-rated health among older Chinese adults aged 60 years and above using the 2018 Chinese Longitudinal Healthy Longevity Survey (CLHLS).
Methods: Participants were aged 60 and above, without living in institutions, and free from severe cognitive impairment. Dietary diversity was assessed by dietary diversity score, which is the sum of the different food groups consumed by individuals. It was defined as 'high' if respondents scored above the mean. The answers for self-rated health were rated on a Likert scale, which include 'very poor', 'poor', 'fair', 'good', and 'very good'. Ordinal logistic regression was employed to investigate the association between dietary diversity and self-rated health. The effects were further discussed among four different age groups.
Results: Higher dietary diversity was significantly associated with better self-rated health among older adults, even after adjusting for lifestyle factors and chronic conditions. The positive association between dietary diversity and self-rated health maintained throughout the lifespan of older adults.
Conclusions: This study highlights a positive correlation between dietary diversity and self-rated health among Chinese older adults. The findings underscore the potential role of dietary diversity in enhancing perceived health among older individuals, emphasizing its importance in public health interventions aimed at promoting healthy aging in China.

Sociodemographic characteristics, clinical features, and management of conjunctivitis patients at Sanjiwani Hospital, Gianyar

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Background: Conjunctivitis is an inflammatory process affecting the conjunctiva. It is characterized by vascular dilation, cellular infiltration, and exudation. The incidence

of conjunctivitis in Indonesia is approximately 9.7%, and it remains among the top 10 eye diseases at Bali Eye Hospital in 2020.

Objectives: This study aims to determine the sociodemographic characteristics (age, gender, education, and occupation), clinical characteristics (type of conjunctivitis, symptoms, and lateralization), and pharmacological management (type of therapy and drug dosage form) of conjunctivitis patients at Sanjiwani Gianyar Hospital.

Methods: This study employed an observational design with a cross-sectional approach and used a purposive sampling technique (non-probability sampling) with 113 respondents.

Results: The characteristics of conjunctivitis patients based on sociodemographics showed a predominance of individuals aged 51-60 years (23.0%), males (61.9%), and those with secondary education (40.7%). Clinically, patients predominantly suffered from bacterial conjunctivitis (66.4%) and reported red eye complaints (36.3%) in both eyes (52.2%). Regarding pharmacological management, the most common therapy was combination therapy (57.5%). Most patients received eye drops and oral dosage forms of therapy (50.4%).

Conclusions: The study concludes that conjunctivitis predominantly affects men aged 50-60 years. The majority of patients reported red eyes in both eyes. The most frequently prescribed therapy consists of a combination of eye drops and oral medication. Researchers suggest paying attention to risk factors related to the characteristics of conjunctivitis patients, and management should be based on the underlying causes of conjunctivitis.

Antimicrobial use and consumption surveillance support antimicrobial resistance containment: experiences from Nepal

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Background: Information on Antimicrobial use (AMU) and consumption (AMC) complement surveillance of antimicrobial resistance (AMR) and is crucial for planning interventions to contain AMR in a One Health model. In Nepal, although AMR surveillance has been in place for two decades, AMC surveillance only started in 2018 while there was no AMU data until 2021.Consequently, there was no comprehensive data to accurately indicate the extent of AMU/AMC or to correlate it with the AMR surveillance data.

Description: Strengthening the AMR/AMU/AMC surveillance systems in all sectors to generate evidence for policy recommendations has been a priority for Nepal, supported by the Fleming Fund Country Grant for Nepal. Under the AMR multisectoral steering committee, this effort involved strengthening and establishing surveillance infrastructures, development and standardization of guiding documents and tools, and training local human resources to ensure sustainability and institutionalization of the program. Data from sectoral AMR/AMU/AMC surveillance were shared locally, nationally and globally. Hospital-based AMU PPSs were conducted in six tertiary care hospitals across Nepal from 2021-2023. The data prompted withdrawal of the not-recommended fixed-dose antibiotic combinations from the market and prompted antimicrobial stewardship actions in hospitals. AMC data were collected from domestic manufactures and importers which reflected the AMU practices and closely correlated with the antibiograms.

Lessons Learned: Robust and efficient surveillance systems generate useful and comprehensive data for evidence- based decision-making. Integrated interpretation of AMR/AMU/AMC surveillance data provides holistic solutions to AMR issue. Engagement of stakeholders early and often ensure ownership of the program.

Next Steps: Improve and maintain quality of AMR/AMU/AMC surveillance data. Expand AMR/AMU/AMC surveillance to more hospitals, and in other sectors including the environment, aquaculture and dairy cattle. Integrate AMR data analysis of all sectors and correlate with AMU and AMC data. Enhance use of surveillance data for advocacy, awareness, policy recommendations and to support design and implementation of interventions for AMR containment.

The attitude of patients towards the usage of telemedicine in public hospitals in Bangkok and its metropolitan regions

Jidapond Chiewchengchol

Background: Telemedicine is the term used for the services that allow patients to consult with medical professionals from a remote area. Since the recent COVID-19 pandemic, telemedicine platforms have become more well-known around the world, where hospitals have begun regularly utilising this technology to improve the efficiency of their treatments or consultations. However, some countries, specifically Thailand, seem to have a large number of patients who are not taking advantage of the new platforms, and the reasons behind this reluctance are still in question.

Objectives: To determine the reasons of using and not using

telemedicine in Thailand and how to improve the platforms.
Methods: This research was conducted through a questionnaire of 52 participants from King Chulalongkorn Memorial Hospital (n = 10) and Thammasat University Hospital (n = 42). The participants ranged from 18 to 80 years old with different educational levels, salary, religions, residential areas and underlying conditions. The questionnaire investigated the awareness of the existence of telemedicine, reasons of using and not using telemedicine, and suggestions to improve these platforms as well as whether the participants would continue using it after the explanations.
Results: The majority of participants (n = 38/52, 73.1%) were unaware of the existence of telemedicine. After explaining the basic information, the advantages and disadvantages of using the platform, most participants (n = 29/38, 76.3%) were still not interested. The largest proportion of these participants (n = 25/29, 86.2%) preferred seeing a doctor in person. In addition, the participants (n = 9/14, 64.3%) who knew about telemedicine chose not to use telemedicine in the future.
Conclusions: The majority of our Thai participants chose not to use telemedicine because of unawareness of the existence, unwillingness, preference to see a doctor in person, and distrust in telemedicine. Most participants who regularly used telemedicine believed that applications of telemedicine and increasing awareness by advertisement could increase the number of people using telemedicine.

Donor human milk practices in India: an analysis of health system barriers and facilitators

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Background: Despite high birth rates and neonatal mortality, India faces significant challenges in implementing effective, regulated human milk banks. Access remains limited with only 50 banks as of 2017, mostly concentrated in the western region. Insufficient collaboration among medical professionals, lack of lactation counselors, and low public awareness hinder widespread adoption. Most banks rely on in- facility collection and dispensation, limiting donor participation and post-discharge access. Despite government acknowledgment and recent guidelines, implementation across India's diverse health system remains unclear. Given high rates of low birth weight and preterm births, comprehensive research is needed to identify and address key barriers within the health system.
Objectives: i. To describe the status and challenges of donor human milk practices in India ii. To identify and analyze the health system factors that affect the availability and accessibility of donor milk services. iii. To identify and analyze the health system factors that affect the quality and safety of donor milk services and outcomes.
Methods: This study employs a documentary review methodology to analyze donor human milk (DHM) practices in India. It examines literature, reports, and evidence from various sources. The research utilizes the WHO's six health system building blocks and bottleneck analysis to identify barriers and facilitators impacting DHM services.
Results: This study identified critical health system barriers to human milk banking in India, including inadequate staffing, insufficient infrastructure, and low awareness among healthcare providers and families. Cultural beliefs and family dynamics significantly influence milk donation acceptance. Key facilitators include government plans for scaling up human milk banks and positive perceptions among some providers and recipients.
Conclusions: Standardized protocols, improved healthcare provider training, and targeted community education are essential for expanding human milk banking in India. A comprehensive, culturally sensitive approach is crucial for effective implementation and improved neonatal outcomes.

Analysis of the management of vaccine-preventable diseases (VPDs) at Tanah Baru Community Health Center, Depok, Indonesia

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Background: Due to COVID-19 disruptions, around 80 million children are at risk of diphtheria, measles, and polio. In Indonesia, 2023 saw an increase in VPD cases despite the VPD program, including 136 cases of rubella, 103 cases of diphtheria, 8 cases of polio, 14 cases of tetanus, and 149 cases of pertussis. Depok City reported 4 diphtheria cases with a 50% fatality rate, 2 cases of pertussis, 206 cases of hepatitis B, and 26 cases of measles. Tanah Baru Community Health Center recorded 1 case of diphtheria, 1 case of pertussis, 27 cases of measles, and 1 case of AFP, with immunization coverage dropping to 92.1% from 96.2% in 2022.
Objectives: To analyze the input, process, and output in the management of the VPDs program at Tanah Baru Community Health Center, Depok, Indonesia.
Methods: This study employed a qualitative case study approach, using primary data from interviews and secondary data from document reviews.
Results: The study evaluated seven variables: Input (human resources, funding, facilities, logistics), Process (SOPs, communication), and Output (immunization achievements). The VPD team is well-qualified and trained. Funding is provided by special allocation and local budgets, though there are occasional provincial stock shortages. Vaccine storage meets standards, but a shared room is used for vaccination. Logistics are managed via

the SMILE app, with generally smooth distribution and some shortages. Missing critical SOPs affect service quality. Communication complies with regulations but faces community resistance due to religious beliefs. Immunization coverage is below 35% for each vaccine type and under 30% overall.
Conclusions: The VPD program at Tanah Baru is well-staffed and funded, but vaccine coverage is below targets, and critical SOPs, such as AESI handling, are missing. Communication is effective but faces community resistance. Future efforts should focus on developing essential SOPs and enhancing cross-sector collaboration to improve service quality and address vaccination resistance.

Time-restricted eating in people with overweight and obesity: a review and recommendations
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Background: Time Restricted Eating (TRE) has been shown to improve endocrine performance, but its use in overweight and obese patients remains controversial.
Objectives: This systematic review aims to explore evidence-based recommendations for implementing TRE in people with overweight and obesity, considering its potential in reducing the risk of chronic diseases. As specific guidelines for TRE implementation are lacking, our objective is to provide a scientific foundation for clinical practice and optimize the efficacy of TRE.
Methods: The relevant literature was systematically searched across 9 databases and 4 specific websites, including CNKI, VIP, Wangfang, SinoMed, Cochrane Library, Embase, JBI, PubMed, and WOS; the websites include UpToDate, GIN, NICE, and WHO, available from inception to 31 January 2024. Subject words and free words were used to search, and the types of documents included included RCT, guidelines, expert consensus and systematic review. Two researchers independently assessed the selected documents using appropriate evaluation tools, and any discrepancies were resolved by a third party.
Results: Of 5531 records, 25 articles (comprising 5 management guidelines for obesity, 3 expert consensuses, 8 systematic reviews, and 9 RCTs) were included. Synthesizing 30 evidence pieces covering pre-intervention, intervention, and post-intervention phases revealed crucial aspects during the intervention, such as Eating Window, Intervention Duration, Energy Restriction, Psychological and Sleep Management.
Conclusions: Our findings highlight the significance of timing and duration of eating windows in effective TRE. The integration of caloric restriction, when applied judiciously, may enhance the effectiveness of weight loss. In conclusion, healthcare practitioners can utilize this evidence to devise comprehensive TRE interventions for people with overweight or obesity.

Human-centered digitization of the comprehensive geriatric assessment (CGA) project in the Philippines: lessons learned
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Background: The comprehensive geriatric assessment (CGA) is a multidimensional and multidisciplinary evaluation and management process to identify and address the needs of an older person. However, there are several challenges faced in its implementation which limit its full potential and utility to promote healthy aging.
Description: Project 3 Digitization of the CGA forms part of the University of the Philippines Manila Wellness Initiative for Seniors and Elders (UPMWISE) research program, which aims to improve the measurement, monitoring, and research on healthy aging by digitizing the CGA following the human- centered design (HCD) approach. Mixed methods of data collection and three phases of the HCD approach were utilized.
Lessons Learned: The initiative to digitize the CGA has been well received by older persons, healthcare professionals, policy makers, program planners, and a facility administrator based on the data from the focus group discussions, online survey, and concept validation. Data privacy, length of the interview, incomplete information, sensitive questions, difficulty in CGA administration due to patient's condition, follow up issues, and questions requiring recall were identified as the design challenges. A system that is accessible, modifiable, or customizable per health setting, user-friendly, and one which addresses the identified challenges in CGA administration is envisioned by the potential end users of the digitized version.
Next Steps: Addressing the identified issues and challenges and considering the support needs of those involved and end users of CGA is essential in designing the target digital CGA to enhance user experience and ensure end users' uptake of the technology. Field testing in health settings, further enhancement of the current system incorporating AI, and further electronic CGA-based studies are the recommended next steps to maximize its potential in measuring, monitoring, and conducting research on healthy aging.

Trends in geopolitical and socio-economic disparities in antenatal and postnatal care in Cambodia, Laos, and Vietnam

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Background: Ensuring high-quality care during pregnancy, childbirth, and postnatal periods for mother-child dyads is essential for reducing maternal and neonatal mortality, as well as for the short- and long-term health and well-being of mothers and children. However, disparities among and within countries remain, affecting progress toward achieving the Sustainable Development Goals with equity.

Objectives: To examine 10-year trends and disparities in antenatal care (ANC) and postnatal check-ups within the first two days (PNC2D) in Cambodia, Laos, and Vietnam.

Methods: We used data from nationally representative, publicly available data from Demographic Health Surveys (DHS) in Cambodia in 2010, 2014, and 2020; Multiple Indicator Cluster Surveys (MICS) in Laos in 2006, 2012, and 2017; and MICS in Vietnam in 2011, 2014, and 2021. We examined the overall and stratified trends by geopolitical and socio-economic characteristics.

Results: In Cambodia in 2020, the prevalence of ANC with at least four visits (ANC4+) was 86%, and 64.4% of women received at least three components (ANC3C). Nearly all births (97.9%) were in health facilities, and 84.5% of mothers and newborns received PNC2D. In Laos in 2017, the prevalence of ANC4+ was 62.2%, and 29.2% of women received ANC3C. Additionally, 64.5% of mothers gave birth in health facilities, and 47.6% of mothers and newborns received PNC2D. In Vietnam in 2020, ANC4+ prevalence was 88.2%, 74.0% of women received ANC3C, 96.3% of births were in health facilities, and 88.2% of mothers and newborns had PNC2D. In the three countries, mothers with lower education, from the lowest income quintile, and living in remote areas received poorer ANC and PNC2D.

Conclusions: Despite progress in the three countries, disparities persist in ANC and postnatal care based on ethnicity, education, income, and place of residence. Targeted interventions are needed to ensure equitable access to high-quality maternal healthcare for all women and children, regardless of their socio-economic background.

Design, uptake, and adaptation of a curated global infant and young child feeding e-learning course to capacitate frontline health workers

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Background: Health workers are crucial in delivering quality infant and young child feeding (IYCF) services, including skilled counseling for breastfeeding and complementary feeding. Access to quality IYCF training that fits health workers' busy schedules has been limited. The Covid-19 pandemic highlighted the advantages of e-learning platforms, such as flexibility, increased access, standardized course delivery, and workforce monitoring.

Description: The IYCF E-learning Course "Investing in Child Nutrition" – a free, practical, competency-based, self-paced course – was developed using materials from UNICEF and WHO, following the ADDIE (Analysis, Design, Development, Implementation, and Evaluation) model for course development, and with support from a digital solutions service provider and a technical steering committee. This e- learning course is available in English and French, with adaptations to Arabic and Vietnamese. From June 2019 to January 2021, about 2000 learners from 106 countries accessed the course. Positive feedback was received on the inclusive content and imagery, and the breadth of resources.

Lessons Learned: This e-learning course showcased rapid development and adaptability to specific contexts. Using a digital solutions provider, an expert advisory committee, and an agile process, we developed an extensive course. Sourcing content from authoritative agencies saved time and resources. Adaptability allowed us to tailor the course to the Jordanian and Vietnamese contexts, proving its cross-country flexibility. Digital delivery of nutrition and health training remains globally relevant, addressing health workers' capacity-building needs. However, accessibility (e.g., digital devices, internet access) and sustainability (e.g., maintenance and upgrading costs) must be considered. Partnering with UNICEF for hosting on the Agora Global Learning Hub will ensure ongoing relevance and accessibility.

Next Steps: The course will undergo continuous monitoring and evaluation to ensure its effectiveness. Efforts will be made to build strategic partnerships, update and localize the course, develop a sustainability plan,

address technology access inequities, and promote the course through various channels.

How does Hong Kong make innovative cancer drugs available and affordable: a qualitative analysis of policy documents and stakeholder interviews

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Background: Despite Hong Kong's status as a leader in life expectancy, access to innovative cancer drugs remains limited.
Objectives: This study aims to identify the policies that facilitate access to these drugs and the challenges encountered in their implementation.
Methods: A qualitative approach was adopted, comprising a review of 207 policy documents and interviews with 16 stakeholders. Key components affecting access to cancer medications were analyzed, focusing on research and development (R&D), market authorization, selection, and financing, particularly concerning availability and affordability. Interview participants included internal stakeholders (decision-makers from the Hospital Authority, oncologists, and other medical professionals) and external stakeholders (pharmaceutical companies and patient advocacy groups). Data synthesis was performed using an inductive-deductive thematic analysis approach.
Results: Recent policy shifts in Hong Kong have emphasized market authorization and financing. Facilitators of availability include proactive reforms in market authorization (such as the "1+" mechanism and primary evaluations), named patient programs for early access, and expedited formulary selection processes. For affordability, key facilitators include relaxed criteria for safety nets, patient access programs, and innovative private insurance schemes. However, implementation challenges persist, notably the insufficient emphasis on rigorous health technology assessments (HTA), lack of transparency in decision-making, and constrained drug budgets.
Conclusions: This study highlights the urgent need for improved access to innovative cancer drugs in Hong Kong. Recent government initiatives aim to enhance access through more proactive evaluations and approvals, thereby expediting the availability of advanced treatments, fostering competitive pricing, and increasing subsidies.

Automated electrodiagnosis result prediction of carpal tunnel syndrome severity based on patient clinical information

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Background: Carpal tunnel syndrome (CTS) is the most common upper extremity nerve entrapment causing numbness, weakness, and difficulty in using hands, impacting daily activities and quality of life. Early detection and severity classification are essential for timely treatment and better outcomes. This study explores machine learning models to classify CTS severity using clinical data, aiming to aid physicians in initial diagnosis and management, especially in areas where electrodiagnosis is not widely accessible.
Objectives: To develop a machine learning model to predict the severity of electrodiagnosis results in patients whose clinical symptoms are suspected to be indicative of carpal tunnel syndrome.
Methods: This study is observational Cross-sectional Applied research conducted in the department of Rehabilitation at King Chulalongkorn Memorial Hospital. The subjects include patients suspected of having carpal tunnel syndrome who came for an electrodiagnosis examination at King Chulalongkorn Memorial Hospital. Patient clinical data, including history and physical examination results, as well as electrodiagnosis findings, were collected from individuals suspected of carpal tunnel syndrome and were used to develop a machine learning model.
Results: The eXtreme Gradient Boosting model exhibits the best performance in both multi-class (normal, mild, moderate, and severe) and binary class classifications, achieving an Area Under the Receiver Operating Characteristic (AUROC) of 0.76 and 0.896 on the validation set, with overall accuracies of 56% and 81% on the test set, respectively. Notably, the binary class classification model, which distinguishes the severe group from others, demonstrates superior performance in all optimal models when compared to multi-class classification.
Conclusions: In this study, machine learning models were developed to classify the severity of Carpal Tunnel Syndrome (CTS). The eXtreme Gradient Boosting model demonstrated the best performance in accurately classifying the severe group. The developed model has the potential to aid clinicians in the initial management of patients suspected of having Carpal Tunnel Syndrome.

Cyber-security in the implementation of a digital depression application (VMood) in Vietnam

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Background: Our research team is implementing a digital depression intervention (VMood smartphone application) in Vietnam in a stepped-wedge, randomized controlled trial. VMood is adapted from a Canadian evidence-based in-person intervention called Supported-Self-Management (SSM), which is based on cognitive behavioral therapy principles and utilizes supportive coaching from a provider. Ensuring the privacy and safety of participants is critical amidst the rise in potential risks related to cyber-security that threaten the deployment of VMood and other digital health interventions.
Description: VMood is being implemented at the commune level in eight Vietnamese provinces with 480 participants. VMood reflects the structure and process of the in-person SSM, offering depression management tools and access to support from experts (social workers, psychiatrists) through a chat function. Data is encrypted and transferred from users' smartphones to a cloud server using RESTful-API model.
Lessons Learned: In January 2024, cyber-security risks emerged in Thanh Hoa province, where digital scams through smartphones became prevalent. Hackers used smartphone apps and SMS internet links to conduct phishing scams, targeting bank accounts and personal information. Local police intervened, advising residents to avoid installing smartphone apps, including VMood, hampering the project's recruitment. To address these issues, our research team engaged with government officials and implemented several measures: an Information-Education-Communication campaign to enhance public knowledge about VMood's cyber-security, assurances to provincial authorities regarding VMood's safety, increasing the visibility of government support to encourage trust and uptake, collaboration with VMood's developers to enhance its security. As a result, the system's security was fortified, public awareness and trust improved, leading to increased downloads and engagement.
Next Steps: Our team, with developers, continues to work on ensuring VMood's cyber-security meets national and international security standards through ongoing security measures: implementing HTTPS for websites and APIs, restricting access permissions from external IPs to the database, conducting bi- daily database backups, performing security scans with ZAP tool.

Exploring data governance in healthcare of older persons: a scoping review

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Background: The state of research on data governance (DG) in the health of older persons (OPs) is unexplored. This leaves little guidance for its application in practice and for future research.
Objectives: This scoping review aimed to synthesize available information on data governance in the context of OPs' health based on evidence from literature.
Methods: We followed the methodological framework of Arksey and O'Malley and PRISMA. We searched the following online databases; PubMed, Cochrane, Ovid, ACM, IEEE Xplore, and Google Scholar, and consulted with experts. Published research and grey literature covering January 1, 2000 to April 22, 2024 were collected. Two independent reviewers performed the search, screening, extraction, and full texts review. A third reviewer made the final decision for the unresolved disagreements between the first two reviewers. The WHO Pan American Health Organization framework, a high-level framework for planning and implementing DG in public health, was utilized. Descriptive statistics were employed and narrative approach was used to summarize the results.
Results: Of the 9,847 titles identified, 57 articles were included in the review. Topics covered were fall risk assessment and detection, monitoring systems, dementia, healthy aging, assistive care, frailty, depression, and others. Of these, DG components were 35 (61.4%) tools/technologies, 19 (33.3%) processes, and 3 (5.3%) people. Data controller, processor, researchers, subject/patient, and relevant organizations are involved in DG. Key characteristics of DG frameworks include involving the stakeholders from planning to implementation and defining their roles, obligations, and the system. No studies on data retention and destruction, and establishment of policy and prioritizing investment as part of DG functions were collected.
Conclusions: Studies on DG components particularly technologies and processes are available. However, studies specific to the governance of OPs health data is limited. Further studies on governance of data on common conditions of OPs, decision making structure, and the identified gaps are recommended.

The impact of e-cigarette taxation: a systematic review and meta-analysis on usage, pricing strategies, and public health implications

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Background: In recent years, e-cigarettes have emerged as a potential alternative to traditional cigarettes, but

their public health implications remain a topic of ongoing debate. To regulate the use of e-cigarettes, taxation has been proposed as a policy tool.
Objectives: This study aims to systematically review and analyze the impact of e-cigarette taxation on various stakeholders, including government, manufacturers, retailers, and consumer behavior.
Methods: Following PRISMA guidelines, eight electronic databases and grey literature sources were utilized to identify relevant studies. Eligible studies included quantitative research on e-cigarette taxation policies. Data synthesis involved a narrative summary focusing on tax pass-through rates and elasticity. Meta-analysis calculated pooled Odds Ratios (OR) for e-cigarette usage between tax and no tax groups. Quality assessment was conducted using JBI Critical Appraisal Checklists.
Results: A total of 27 studies were included: 19 quasi-experimental and 8 cross-sectional. The tax increased government revenue. The meta-analysis showed that e-cigarette taxation significantly reduced usage among adults (OR: 0.89, 95% CI: 0.84–0.94) and youth aged 18–24 (OR: 0.87, 95% CI: 0.78–0.98). Notable heterogeneity in tax elasticity was observed, ranging from -0.62 to -0.02, suggesting inelastic demand in some cases. The pass-through rate ranged from 0.07 in China to 1.67 in the USA, highlighting differences in company pricing strategies and market responses. Price-based taxes had a lower pass-through rate and higher effect than volume-based taxes. Furthermore, the lack of coordinated tax policies across regions could undermine the overall effectiveness of e-cigarette taxation.
Conclusions: E-cigarette taxation impacts prices, sales, and consumption variably, influenced by tax policy specifics, market conditions, and stakeholder behavior. Coordinated tax policies and comprehensive strategies, including tax increases on combustible cigarettes, enhanced regulations, and public health education programs, are essential for maximizing public health benefits.

Factors influencing influenza vaccination intention among primary care workers post COVID-influenza-RSV triple waves: insights from a "3C" model-based analysis

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Background: By the end of 2022, China adjusted its zero-COVID policy, followed by unprecedented waves of SARS-CoV-2, influenza, and RSV infections.
Objectives: This study aimed to investigate the factors influencing influenza vaccination intention among primary care workers following the COVID-influenza-RSV triple waves in 2023 in China. The goal was to provide evidence for targeted policies aimed at motivating primary care workers to receive influenza vaccination.
Methods: An online survey was conducted from August 18, 2023, to September 4, 2023, targeting primary care workers in three randomly selected districts of Jinan. The survey collected data on demographic characteristics and utilized the dimensions of the "3Cs" model (confidence, complacency, and convenience).
Results: A total of 1673 respondents participated in the survey, with a response rate of 67.3%. Among them, 26.36% expressed unwillingness to vaccinate against influenza. Logistic regression analysis revealed that confidence and complacency in the "3Cs" model significantly influenced influenza vaccination intention. Additionally, workers vaccinated during the previous flu season were more inclined to get vaccinated again ($P < 0.001$). Further analysis showed that frontline female workers aged 33-40, working in preventive healthcare departments, and those vaccinated or uninfected in the previous flu season demonstrated higher confidence in influenza vaccines. Workers with chronic diseases, non-rated job titles, and those infected in the previous season showed lower complacency. Workers at community health service centers, frontline females aged 41-48, in administrative roles, and vaccinated in the previous season perceived greater vaccine convenience.
Conclusions: Confidence and complacency in the "3Cs" model significantly influence primary care workers' willingness to vaccinate against influenza. Enhancing awareness and trust in influenza vaccines while addressing complacency can improve influenza vaccination rates among primary care workers. Targeted interventions based on these findings can effectively promote influenza vaccination uptake in this population.

Characterization of ultrafine particles and number size distribution of airborne particles in Buddhist religious places in Bangkok

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Background: Burning incense is a common practice in Asian countries that has been shown to be a significant source of indoor particulate matter and other contaminants. Despite this, there remains a substantial gap regarding our understanding of the particle size distribution and characteristics of ultrafine particles resulting from incense burning.
Objectives: This research aims to characterize the particle number size distribution observed near incense burning source and far from incense burning source in temples/

shrines in Bangkok, Thailand.
Methods: Sampling was conducted in four different temples and shrines located throughout Bangkok, Thailand on a Buddhist religious day. The sampling period extended from 10 AM to 5 PM, utilizing real-time aerosol measurement instruments, namely the Scanning Mobility Particle Sizer (SMPS) and the Optical Particle Sizer (OPS). The instruments were capable of detecting particles from 10nm to 10μm. Two sets of these instruments were deployed concurrently to indicate near-source and far- from-source events.
Results: The highest particle number concentrations were recorded at 3.3e6 #/cm^3 and 9.39e5 #/cm^3 for near source and far from source, respectively. The "near-source" concentration was consistently almost an order of magnitude higher than the "far-from-source" concentration. The hourly particle size distributions at all sites generally exhibited three modes, with occasional periods showing four or five modes. In general, almost all peak number concentrations occurred in the ultrafine particle size range (<100 nm). Based on the hourly average particle number concentration, the predominant size range was 10-100 nm.
Conclusions: The results suggest that individuals whose work involves the use of incense are exposed to very high concentrations of UFP. Given that the particles emitted from incense sticks are predominantly in the ultrafine particle (UFP) size range, prolonged inhalation of this smoke poses significant health risks.

Maternal exposure to polystyrene nanoplastics during pregnancy and lactation induces testis development disorder in male off spring mice

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Background: Nanoplastics (NPs), emerging environmental pollutants, are known for their harmful effects on humans, including transgenerational toxicity by crossing the placental barrier. However, limited studies have explored whether early-life NP exposure causes reproductive toxicity in male offspring, with unclear underlying mechanisms.
Objectives: To investigate the harmful effects and mechanisms of polystyrene nanoplastics (PS-NPs) exposure during pregnancy and lactation on the testis development in male offspring mice.
Methods: ICR mice were exposed to 0 and 100 mg/Kg bw PS-NPs (60 nm) by oral gavage every two days from the gestational day (GD) 1.5 to postnatal day (PND) 21. The male offspring mice were sacrificed on PND 23, PND 30, or PND 70. The histopathological structure of testes was observed following HE staining. Six testicular samples were randomly selected from the control and PS-NPs groups from PND 23 to perform RNA sequencing.
Results: At PND 23, PS-NPs-exposed mice showed reduced spermatogenic cell layers, increased vacuolation, and decreased number of primary spermatocytes and seminiferous tubule diameter compared to controls ($P < 0.01$). At PND 30 and 70, the number of primary spermatocytes and spermatids also showed a significant decrease in the PS-NPs group compared to the control group ($P < 0.05$). RNA sequencing identified 627 differentially expressed genes at PND 23, including 312 upregulated and 315 downregulated genes. Kyoto Encyclopedia of Genes and Genomes (KEGG) analysis highlighted pathways such as steroid hormone biosynthesis, metabolism of xenobiotics by cytochrome P450, pentose and glucuronate interconversions, and pantothenate and CoA biosynthesis in testis development.
Conclusions: Maternal PS-NPs exposure during pregnancy and lactation could induce testis development disorder in male offspring of mice, which may be regulated by the disrupted metabolic pathways, such as hormone biosynthesis and energy production. The results of this study offer a perspective on assessing the reproductive safety of NPs.

Promoting youth engagement and participation in public health policy-making process in Thailand through workshops and a pitching challenge

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Background: Youths' public health policy literacy and participation are crucial to developing a sustainable national health system. However, current academic curricula in Thailand and many countries rarely include public health policies in study programs at any level including medical schools. Our student-led initiative aims to address this problem in medicine undergraduate programs, other undergraduate programs, and high school programs, and to evaluate the literacy, participation, and a sense of commitment to the public health policy-making process.
Description: We arranged a one-month series of workshops and a pitching challenge in public health policy. Participants are encouraged to exchange their ideas with others and form a team to compete in the pitching challenge. Selected proposals will be submitted to represent youth voices in the public hearing process at the 14th Thailand National Health Assembly. During the program, we asked the participants to evaluate themselves on their knowledge and other perspectives. This program is academically supervised by the National Health Commission Office of Thailand.

Lessons Learned: Our program raises the current gap in youths' public health policy literacy and participation. The interactive nature of the workshops and a pitching challenge proved highly effective in engaging participants and fostering a deeper understanding of public health policy. We could demonstrate the example solution to increase meaningful youth engagement through a participatory process in the Thailand National Health Assembly.
Next Steps: Our program highlights the challenge of public health policy education not only in medical schools but also across all educational levels, emphasizing the need for long-term integration into curricula. Our program is flexible to adapt to other settings with larger scales and different participants. By creating a structured pre and post-evaluation analysis, we would better measure our program's impact and identify areas for continuous improvement to make it become more sustainable.

Health education and literacy malaria at school in Keerom Regency, Papua-Indonesia

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Background: Malaria is a prevalent health challenge at Keerom District. The approach to mitigate the transmission of malaria in households and educational institutions is to engage both staff members and students.
Objectives: The study examined the cognitive, affective, and behavioural aspects of students in relation to eliminate malaria
Methods: This research conducted November-Desember 2023. This cross-sectional study employed purposive sampling from grades 4-9 at schools whose teachers had been trained in malaria prevention. The schools included PIR 4, Min Arso 3, Swakarsa, Tegasa Arso, Yetti, and Arso 2. The total sample was 256 students (male= 101; female=155). The students were assessed on 15 knowledge, 24 attitude, and 6 indicators of behaviour. They had been requested to complete a pre-test and post-test. Health education activities had been done to raise awareness about malaria and to identify mosquito larva. The data analysed using a paired sample t-test and multiple linear regression in the R version 4.3.2, and logistical regression in SPSS v26
Results: The distribution of ages: 9-11 years (n=105), 12-15 years (n=147), and 16-18 years (n=4). The student's level of knowledge was 44.73%, their attitude (71.5%), and their behaviour (69.33%). The findings of the double linear regression indicated that influencing attitudes towards student conducted (P-value < 0.000) and knowledge did not have a significant impact. The logistic regression analysis indicated that the behaviour of a buried object that can lead to water stagnation had a significant influence on the attitude of the student (P <0.008; OR 1 vs 1.152), whereas knowledge did not have a significant affect. The paired t-test findings indicated a significant improvement in students' knowledge before and after literacy intervention (P<0.000). The pre-test correct answer rate was 5.99, and the post-test difference was 7.63, with a mean difference of 1.64.
Conclusions: Consistent implementation of malaria education was needed in schools to decrease malaria cases

Association of intrinsic capacity and long-term PM2.5 exposure with incidence of coronary heart disease: perspective study in CHARLS

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Background: The elderly face a heightened risk of coronary heart disease (CHD), potentially influenced by factors such as declining intrinsic capacity (IC) and long-term exposure to air pollutants including PM2.5. However, existing literature is limited and exhibits significant heterogeneity.
Objectives: This study aims to investigate the longitudinal relationship of IC deficiency and long-term PM2.5 exposure with incident CHD in Chinese older adults.
Methods: This study used data from four waves of the China Health and Retirement Longitudinal Study (CHARLS) spanning 2011 to 2018, which collects information through structured questionnaires. Participants aged ?60 without CHD at baseline were included in the longitudinal analysis. IC deficit scores were assessed by five dimensions: locomotion, cognition, vitality, sensory, and psychology (0 [better] to +5 [poorer]). City-level annual mean PM2.5 concentrations were assigned to each participant based on their city location. Physician-diagnosed CHD was self-reported by participants. Generalized Estimating Equations (GEE) were performed to investigate the association between IC deficiency, long-term PM2.5 exposure, and incident CHD.
Results: A total of 4168 participants (mean age:66.9 years, female: 46.5%) with 7337 visits were included. During a median follow-up of 4 years, 407 new CHD cases were reported. The GEE model estimated an odds ratio (OR) of 1.30 (95% CI: 1.17-1.44) for CHD per one-point increase in IC deficit score and an OR of 1.15 (95% CI: 1.08-1.22) per 10 g/m³ increase in annual mean PM2.5 exposure. Subgroup analysis indicated stronger IC deficiency effects on CHD in females and rural populations, while long-term PM2.5 exposure had greater impact in males and urban dwellers.
Conclusions: Monitoring IC scores and reducing PM2.5 exposure could aid in the early detection and prevention

of CHD. These findings underscore the importance of targeted interventions tailored to population- specific risk factors to address the growing burden of cardiovascular disease among the elderly in China.

Towards sustainability of global health on mass gatherings health risk preparedness, prevention and response: lessons learned from Tokyo 2020 to Paris 2024 Olympic and Paralympics Games

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Background: Tokyo 2020 was postponed one year and held admit the outbreak of Covid-19. With efforts and intervention from WHO, IOC(IPC), Janan's government, the organizing committee, and also partnerships in private sectors, countermeasures and actions taken by these multi-stakeholders were proven to be effective, such as MoU on vaccination donation between IOC and such as pharmaceutical companies, from the policy level, WHO provided mass gatherings guidance (International Health Regulation, mass gatherings risk assessment tool, recommendations, and so on, with Japan's local policy, which provided a policy base for COVID-19 control for mass gatherings, especially Olympics and Paralympic Games.
Description: From Tokyo 2020's case, it is remarkable that although collaboration has been established between WHO, IOC, and Japan, WHO can only provide advice and assessment results as a reference. To meet mass gatherings in a local context, the final decision-making on the Olympics and COVID policy was made by Japan. A unique academic consortium named Academic Consortium 2020 (AC2020), composed of 29 public health sectors was built in Japan, in 2016, it played a role in policy- making and coordination for Tokyo 2020 and it has not yet been dismissed and continues to work for the upcoming MGs.
Lessons Learned: For global health and MGs topics, policies have been developed like PPR (preparedness, prevention, and response) for global health and pandemic control, but policies on a global level sometimes to fit the local context, sustainable and multi-dimensional framework on global health strategy should be built. Also, a systematic emergency response is recommended as MGs may refer to many public health sectors, not only pandemic prevention.
Next Steps: In terms of sustainability, building a long-term framework and multi stakeholder collaboration on global health and MGs are necessary. Also, in the context of post-COVID for Paris 2024, not only WHO and IOC, PPR for MGs, local collaboration on multiple sectors are recommended.

Assessing the knowledge, attitudes, practices, and beliefs of Barangay Health Workers (BHWs) regarding mental health in Iloilo, Western Visayas, Philippines

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Background: In recent years, substantial strides have been made to address large gaps in Philippine mental health care, including the first piece of mental health legislation being passed in 2018. It is more important than ever to assess the knowledge, attitudes, beliefs, and practices regarding mental health of barangay health workers (BHWs), the frontliners of healthcare.
Objectives: The objectives of this project are to assess the mental health literacy of BHWs in Iloilo province and describe the attitudes, beliefs, and practices of BHWs surrounding mental health in Iloilo province.
Methods: The Mental Health Literacy Scale (MHLS; O'Conner, 2015), a quantitative tool, was used to assess the mental health literacy of BHWs. Qualitative focus group discussions (FGDs) and individual interviews were used to capture data surrounding mental health attitudes and beliefs. The MHLS was distributed to 50 BHWs in each of Iloilo's 5 congressional districts, and 1 FGD and 5 individual interviews were also performed in each district. Quantitative and qualitative data was coded separately into SPSS for descriptive, inferential, and thematic analyses.
Results: Quantitative results showed an average mental health literacy score of 96.53 (minimum possible= 35, maximum=160), suggesting a good basis of literacy with large room for improvement. Qualitative results showed that some people were not aware of where mental illness originates, had stigma regarding it, but there were others who recognized it's environmental and biological bases. The overwhelming majority of BHWS had no training, but wanted some.
Conclusions: There is a need for greater MH training, education, and resources. Quantitative findings suggest room for improvement in MHL, and conversations with BHWs advocate for more MH resources. While many understand that environmental factors are causes for mental illness, there still exists misconceptions & stigma concerning mentally ill individuals in the larger community. There exists a willingness to partake in MH trainings amongst BHWs.

Seasonal impact of daily temperature variation on mortality under extreme temperature conditions in a subtropical city

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Background: Previous studies have demonstrated that ambient temperature variation (TV) adversely affects health outcomes. However, the impact of TV on mortality may vary depending on the direction of temperature change across different seasons.
Objectives: This study aims to elucidate the seasonal impacts of daily TVs on all-cause mortality during extreme temperature conditions.
Methods: A space-time-stratified case-crossover were applied to examine the impact of inter- and intra-day TV on all-cause mortality from 2000 to 2020 in Hong Kong. Conditional logistic regression models were used to examine the association.
Results: During the summer season, when the temperature change between neighbouring days (TCN) was greater than 0, the nocturnal temperature range (NTR) exhibited a significant risk effect on all-cause mortality, with an OR of 1.01 (95% CI: 1.00 - 1.02) per 1-degree increase. On extreme hot days, NTR showed a stronger effect, with an OR of 1.19 (95% CI: 1.11 - 1.27), while the diurnal temperature range (DTR) showed a protective effect with an OR of 0.93 (95% CI: 0.86 - 0.99). During the cold season, when TCN is less than 0, NTR exhibited a significant protective effect on all-cause mortality, with an OR of 0.99 (95% CI: 0.98 - 0.99). Under extreme cold temperature conditions, both DTR and NTR showed protective effects, with ORs of 0.69 (95% CI: 0.60 - 0.79) and 0.65 (95% CI: 0.57 - 0.73), respectively.
Conclusions: The heterogeneous impacts of daily TV during different seasons and under extreme temperature conditions suggest differential body acclimatization to temperature fluctuations.

Training lay health educators in environmental justice and women's health

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Background: The intersection of environmental toxins and climate change poses significant health challenges for the 80% of Latinas living in a historically underserved Los Angeles community with numerous toxic industrial sites. These conditions cause high levels of pollution contributing to reproductive harm and the second-highest breast cancer mortality rate in Los Angeles County. The burden of environmental hazards and socioeconomic stressors exacerbates health disparities. The Iris Cantor-UCLA Women's Health Education and Research Center trained Latinas as lay health educators, or Promotoras, to educate community members on lowering their risks for breast cancer and reproductive harm.
Objectives: This study evaluated the Promotora training program's impact on: 1. Knowledge gains related to environmental toxins associated with breast cancer and reproductive harm 2. Behavior changes to reduce toxin exposure 3. Self-efficacy in educating peers 4. Advocacy engagement in environmental justice campaigns
Methods: Through workshops, coaching, and peer learning sessions, Promotoras were trained. Pre- and post- training surveys assessed changes in knowledge, behavior, self-efficacy, and advocacy. Demographic data provided participant profiles.
Results: The study included 24 Promotoras aged 25-54 (67%) and primarily of Mexican origin (54%), with 42% having completed high school and 42% in the lowest income bracket. Knowledge of household toxins increased by 25%-54%, confidence in reducing exposures and educating others grew by 29%- 46%, and modifying behaviors increased by 13%-21% after the trainings. Advocacy engagement, including signing petitions, participating in clean-ups, and meeting with elected officials, rose by 29%- 54.7%.
Conclusions: The findings highlight the crucial role of culturally and linguistically tailored health education in addressing environmental health disparities. The success of Promotoras as educators and advocates underscores the value of leveraging trusted community members to drive change, particularly in underserved areas. This model offers a blueprint for adaptation in other communities facing environmental health risks, ultimately contributing to systemic change in public health policy and environmental justice initiatives.

The impact of school counseling and psychological sservices on students' academic performance through health indicators in Ghana

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Background: Health issues among students are increasingly recognized, making it a public health concern. However, research on the potential of school counseling and psychological services as an intervention measure, especially in low- and middle-income nations, remains understudied.
Objectives: This study aims to investigate the effects of school counseling and psychological services on academic performance and physical health outcomes through health literacy and mental health among students in Ghana, a developing country.
Methods: The descriptive cross-sectional research design was adopted for the study. Using 386 students, structural equation modeling (PLS-SEM) was conducted.
Results: The findings show that school-based counseling and psychological services significantly improve mental health, physical health, and educational outcomes. Counseling services in primary and junior high schools notably enhance academic performance, health literacy, and mental health. The study further concludes that mental health and health literacy are significant mediators through

which counseling and psychological services contribute to physical and academic achievement.
Conclusions: The study's findings contribute innovatively towards achieving good health and well-being (SDG3) and quality education (SDG4) as part of the 2030 Agenda for Sustainable Development Goals. This study highlights the importance of school counseling and psychological services in improving students' mental health, health literacy, and academic performance, providing crucial insights for stakeholders. It is recommended that educators, policymakers, and mental health professionals collaborate to prioritize and expand access to these services, promoting student well-being and success in Ghana and other low- and middle-income countries.

Use of hypofractionated radiotherapy treatment to reduce carbon emissions in the treatment of prostate cancer: Multicenter study

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Background: Prostate cancer is the most common tumor in men and the third leading cause of cancer death. Radiotherapy is a common treatment for various cancers, significantly impacts the environment through CO2 emissions due to energy-intensive equipment, patient transportation to the facilities. Recently, awareness of healthcare's environmental impact, including radiotherapy, has grown. Efforts are focused on quantifying and reducing the carbon footprint of medical treatments. Hypofractionated or ultra-hypofractionated treatments, which involve fewer but higher doses of radiation, are promising methods to lower CO2 emissions.
Objectives: Evaluate the impact of adopting hypofractionated radiotherapy schemes on reducing CO2 emissions. Compare CO2 emissions from traditional radiotherapy with hypofractionated or ultra- hypofractionated treatments.
Methods: Study Design: Retrospective, multicenter, observational study evaluating CO2 emissions. Study Population: Inclusion: Patients undergoing radiotherapy for prostate cancer at 8 participating centers with linear accelerators from July 2020 to July 2023. Exclusion: Patients receiving palliative care, non-standard radiotherapy, cyberknife patients, and those with incomplete information. Participating Centers: 8 RT centers with linear accelerators across 4 autonomous communities in Spain. Data Collection: Variables to Measure: Type of equipment, total dose, fractionation scheme, number of sessions. Emission Factors: Standardized formula to calculate CO2 emissions from patient transportation.
Results: We have create different graphs, which show the great differences between the treatment of patients with hypofractionated therapy as opposed to normofractionated therapy. Making evident the decrease in CO2 emissions with the hypofractionated treatment.
Conclusions: Hypofractionation reduces the total number of sessions needed, leading to fewer patient visits and trips, thereby lowering CO2 emissions. Fewer sessions result in less disruption to patients' lives and a reduced physical and emotional burden. Studies indicate that hypofractionation is as effective as conventional radiotherapy for tumor control and side effects, especially in prostate cancer.

A formative research to inform and design an HIV community-based service targeting MSM population in South Sulawesi, Indonesia

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Background: Indonesia is one of the most rapidly growing HIV epidemics in Asia, particularly among MSM. Current Indonesian HIV service programs have several challenges to end the HIV/AIDS epidemic by 2030. WHO has recommended implementing community-based services (CBS) to improve service coverage.
Objectives: To collect the perceptions regarding the design and preparation of implementing CBS by community health workers (CHWs) among the MSM population in South Sulawesi, Indonesia.
Methods: Qualitative formative research was conducted from December 2022 to January 2023 to initiate CBS implementation research. Data was audio-recorded and analyzed deduc-tively following the thematic framework approach. Sixty-three MSMs participated in the eight focus group discussions (FGDs) and 22 were interviewed.
Results: All groups of informants stated that HIV CBS is acceptable and feasible to implement among the MSM community in the local context. The proposed characteristics to fulfil a good HIV CBS include meeting the need, community empowerment, community friendliness, free of charge, and eliminating stigma and discrimination. Suggested key considerations in designing the HIV CBS include training for CHWs, service coverage of HIV, human resources, funding, monitoring and evaluation, and effective publicizing.
Conclusions: Implementing HIV CBS could have potential benefits for the community and HIV pro-gram. These multi-stakeholders provided information will be used to design a proof-of-concept implementation of CBS.

Mixed-method evaluation of implementation HIV community-based services among MSM population in South Sulawesi Indonesia

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Background: As one of the most rapidly growing HIV epidemics in Asia, particularly among MSM, current Indonesian HIV programs face several challenges to end the HIV/AIDS epidemic by 2030. WHO has recommended the implementation of community-based services (CBS) to improve service coverage.

Objectives: To assess the acceptability, feasibility, effectiveness, and evaluation of the implemented HIV CBS model

Methods: A cross-sectional study was conducted using a concurrent mixed-method design from June to December 2023. We collected quantitative data using questionnaires and qualitative data using focus group discussions (FGDs) and in-depth interviews (IDIs). We analyzed quantitative data descriptively and qualitative data deductively following the thematic framework approach.

Results: 423 MSM communities accessed the HIV CBS and participated in quantitative data collection, while 37 informants (27 male and 10 female) were involved in qualitative data collection. 84.9% of the total MSM were first-time testers, 2.8% (12) screened for HIV reactive, and 1.9% (8) Syphilis reactive. Participants were also provided with education on behavioral change, condoms, and PrEP information. Referral services were provided to all HIV and Syphilis reactive for confirmatory tests and treatment at health facilities. Mixed-method data integration shows that quantitative findings are corroborated and confirmed by qualitative findings, stating that the CBS model was acceptable, feasible to implement locally, and had the potential to be accepted in developing other regions.

Conclusions: By adopting a well-established HIV CBS model, KPLHS (The Key Population-Led Health Services) in Thailand, our implemented HIV CBS has proven effective in reaching MSM communities, particularly those who had never been tested. It was acceptable among MSM communities, health care providers, and key stakeholders, feasible to implement locally, and potentially accepted if developed in other regions. Some improvements should be considered for future design and establishment in other regions.

Lessons learned from developing the self-help lifting pads to assist elderly with difficulty to sit up from a back pain

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Background: Back pain is one of non-communicable diseases that should be focused from causing insufficient physical activity including hardly sitting up from lying down. This health problem mostly occurs in elderly people due to their age-related physical changes.

Description: Based on the problem, the development self-help lifting pads research was initiated to assist elderly for sitting up easier by granting of the national research council of Thailand. These pads were a device to put on a bed or a floor to help a person sit up without a back force. They are similar to an electrical bed in hospital with low-cost price. The type of pads includes a manual pad (a pad with hand levers adjusted without electricity), an electrical pad, and a massage system pad. The production was contributed of Kasetsart university (a faculty of engineering, a faculty of architecture, a faculty of education) and C.C. autopart company. The research starts with needs assessment following by evaluating an efficiency and an effectiveness of the pads by elderly samples.

Lessons Learned: This research provides pros and cons lessons. The pads have efficiency and effectiveness including good level satisfaction from testing with elders because they provide relaxation feeling from back pain of elderly. However, the research challenges include delaying to import the motors for assembling the pads, waiting research ethics consideration, defective pads from testing and losing the samples for evaluating the pads.

Next Steps: This research provides pros and cons lessons. The pads have efficiency and effectiveness including good level satisfaction from testing with elders because they provide relaxation feeling from back pain of elderly. However, the research challenges include delaying to import the motors for assembling the pads, waiting research ethics consideration, defective pads from testing and losing the samples for evaluating the pads.

Feasibility of a digital mindfulness program (MightyNow) for Chinese university students: a single- arm, pre-post pilot study

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Background: University students face multiple challenges that pose risks to their mental health. Mindfulness training has proven effective in reducing mental health symptoms, but few studies have tested its feasibility among Chinese university students in a social media setting.
Objectives: The study aims to investigate the feasibility of delivering a digital mindfulness program among Chinese university students via a smartphone-based social media application, WeChat.
Methods: A single-arm a pre-post pilot study of the MightyNow, a Mindfulness-based Emotional Balance program developed for university students, was delivered in a social media setting to university students at Shanghai Jiao Tong University in China. The preliminary efficacy and acceptability of the program were assessed by standardized scales and open-ended questions. Descriptive analysis and paired t-tests was conducted by R (version 4.3.2) to investigate the difference between complete and incomplete cases on demographics, mental and physical outcomes, and before and after the intervention respectively. Themes analysis was used to summarize the answers to the open-ended questions on program acceptability.
Results: Among 49 students recruited, 39 (79.6%) students were eligible and completed the baseline survey, and 28 (71.8%) students completed the post-test survey. No significant difference was found on incomplete and complete cases on demographics, mental and physical outcomes. Amongst the 28 complete cases, 39.3% were female (N=11) and the mean age was 21.8 (s.d.=1.9) years. Significant differences were found on depression ($P = 0.033$), self-efficacy in managing anger (P=0.007), mindful attention awareness ($P = 0.009$), and intentions to seek help from digital resources ($P < 0.001$) before and after the program. Qualitative analysis revealed high acceptability of the MightyNow program amongst Chinese university students, two-thirds expressing willingness to recommend the program to peers.
Conclusions: The digital mindfulness program demonstrated good acceptability and substantial benefits for Chinese university students to improve mental wellbeing and help-seeking. * contributed equally to the work.

Assessment of Chinese herbal medicine for managing long-term COVID-19 symptoms: a pre-post study with core herb identification

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Background: The persistence of symptoms following acute COVID-19 infection represents a significant challenge for healthcare systems. Chinese Herbal Medicine (CHM) treatment has emerged as a potential treatment for these lingering symptoms. However, there is a lack of comprehensive research evaluating the impact of CHM treatments on COVID-19 symptom relief and patients physical and mental health status.
Objectives: This study aimed to assess the effectiveness of CHM in alleviating symptom burden and improving physical and mental health among COVID-19 patients, using a pre-post study design.
Methods: A cohort of eligible COVID-19 patients was evaluated at baseline and after a 5-day CHM treatment period. Symptom burden was evaluated using the FLU-PRO questionnaire, while physical and mental health status was measured using Two-item PROMIS® global physical (GPH-2) and mental (GMH-2) health instrument. Association rule mining and social network analysis were used to analyze CHM prescriptions and identify core CHM used in COVID-19 treatment. Linear regression assessed the association between the utilization of core CHMs and changes in symptom scores, as well as physical and mental health status.
Results: Among 324 patients, significant improvement was observed in symptom burden, FLU-PRO total scores, and both physical and mental health status. Notable improvements were found in symptoms related to the nose, throat, and body/systemic areas. Core CHMs identified included Armeniacae Semen Amarum (Kuxingren), Coicis Semen (Yiyiren), Pinelliae Rhizoma Praeparatum (Fabanxia), Mori Folium (Sangye), Forsythiae Fructus (Lianqiao), Talcum (Huashi), and Poria (Fuling). Specifically, Mori Folium (Sangye)and Poria (Fuling) were associated with significant reduced symptoms in the nose system ($P < 0.001$).
Conclusions: The utilization of CHM, particularly the identified core herbs, appears effective in managing COVID- 19 symptoms. Further research through well-designed clinical trials is needed to validate these findings and establish their clinical relevance.

The impact of syndrome differentiation on treatment effects and side effects in randomized controlled trials of Chinese herbal medicine: a meta-epidemiological study

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Background: The potential impact of incorporating syndrome differentiation in randomized controlled trials(RCTs) on the treatment effects and side effects of Chinese herbal medicine(CHM) remains uncertain.
Objectives: This meta-epidemiological study aims to

compare the treatment effects and side effects of CHM in RCTs that incorporated syndrome differentiation versus those that did not.

Methods: A comprehensive search was conducted across seven electronic databases to identify systematic reviews and meta-analyses that pooled RCTs evaluating the treatment effects or side effects of CHM. The search covered publications from January 2021 to September 2022. Meta-epidemiological analyses were performed using a two-step method. Subgroup analyses were conducted based on clinical conditions, outcome types, and funding support. Adjustments were made in the meta- regression models to control for potential confounders, including sample size, funding support, and the risk of bias in RCTs.

Results: The study included 137 systematic reviews, comprising 2,064 RCTs. RCTs incorporating syndrome differentiation showed slightly smaller binary treatment effects ($P = 0.04$) compared to RCTs that did not incorporate this approach. There was no significant difference in continuous treatment effects ($P = 0.26$) or side effects (P=0.66) between the two groups. Subgroup analyses focusing on circulatory diseases and meta-analyses pooling subjective outcomes revealed slightly smaller binary treatment effects of CHM in RCTs that incorporated syndrome differentiation compared to those that did not. These findings remained consistent after adjusting for sample size, funding support, and the risk of bias in RCTs.

Conclusions: Incorporating syndrome differentiation in RCTs does not appear to substantially alter the overall treatment effects and side effects observed in the evaluation of CHM. Further research is needed to validate and expand upon these findings, in order to gain a comprehensive understanding of the role of syndrome differentiation in rigorous scientific evaluation of CHM.

Comparative effectiveness of Chinese herbal medicine prescribed based on syndrome differentiation in GERD treatment: expert consensus and a network meta-analysis

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Background: Traditional Chinese Medicine (TCM) is widely practiced worldwide, yet the integration of syndrome differentiation (SD) into TCM research, particularly in randomized controlled trials (RCTs) evaluating Chinese herbal medicine (CHM), remains limited. A meta-epidemiological study found no overall improvement in treatment outcomes or reduction in side effects with SD, but subgroup analysis in gastrointestinal disease-focused RCTs revealed increased side effects, prompting questions about the necessity and alignment of SD in CHM treatment for digestive diseases.

Objectives: To address this gap, a two-part study comprising a Delphi study and a network meta-analysis (NMA) of RCTs was conducted.

Methods: Part1 introduced a two-round Delphi study prioritized clinically significant digestive disorders guided by the GRADE Evidence to Decision framework. Gastroesophageal reflux disease (GERD) emerged as the focus for Part 2:NMA. We systematically searched nine databases for relevant RCTs up to July 2023. NMA assessed the comparative effectiveness and safety of CHM treatments with different SD statuses. Primary outcome was symptom relief rate, with secondary outcomes including change in symptom scores from baseline, adverse event rate, and recurrence rate. NMA results were interpreted using a minimally contextualized framework, with quality of evidence assessed using the GRADE approach.

Results: In Part 1, Delphi participants expressed varied viewpoints on the relevance of SD, influenced by factors such as prevalent TCM diagnoses and comparative efficacy of TCM versus conventional treatments, with GERD chosen as focus for NMA. In Part2, 34 eligible RCTs involving 4,226 participants and 28 different CHMs were analyzed. NMA suggested CHMs prescribed without SD may be more effective across all measured outcomes except GERDQ score changes. However, these findings had low certainty of evidence.

Conclusions: Divergent viewpoints among Delphi participants highlight uncertainties regarding the importance of SD. NMAs findings suggest CHM treatments prescribed without SD may be more effective for GERD across various outcomes. Further empirical studies are needed to validate findings of this study.

Situational and capability analysis for long term care in the Philippines (SiCAp LTC) project

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Background: With the global population aging, there is an emerging need for access to quality long-term care services (LTC).

Objectives: This study aimed to determine the current situation of LTC service provision specifically, review evidence and policies related to LTC in the Philippines and Southeast Asia, describe the capability and readiness of health workforce, service providers, older persons (OPs, and carers, and determine the cost effectiveness of select LTC services.

Methods: Mixed methods of data collection namely evidence and policy review, key informant interviews (KIIs), focus group discussions (FGDs), and an online survey were conducted. Participating institutions and their designated representatives, OPs, and carers were purposively sampled. Content analysis and descriptive statistics were employed. Cost-effectiveness was determined using Markov modelling.
Results: A review of 148 studies and policies, 15 KIIs, 2 FGDs, an online survey with 14 participating organizations, and mathematical modelling were completed. Limited research on LTC in Southeast Asian countries and research gap on availability and type of LTC evidence for OPs in the Philippines were noted. The participating institutions and organizations have varied roles, initiatives, and readiness for LTC. The costs of LTC in the Philippines depend on the type of service provider, LTC services required, and patient's condition, care, and personnel requirements. The cost ranges from PhP25,000 to PhP180,000.00 per patient per month. The full LTC service isn't as cost-effective as the domiciliary and home care service only.
Conclusions: Long-term care is a wide and complex system which is still underexplored in Southeast Asia, including the Philippines. With the current landscape of LTC provision, the Philippines still has a long way to go in achieving the integrated continuum of LTC appropriate to promote healthy aging. The capability and readiness of the workforce and the community needs to be strengthened. Further research on different LTC types and feasibility and costing studies is recommended.

Unveiling the experiences of healthcare workers in managing communicable and infectious diseases in correctional facilities

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Background: Health workers within correctional facilities face unique challenges in managing communicable or infectious diseases. This research contributes to the literature by exploring the experiences of nurses working in jails, highlighting the issues they encounter in combating these diseases.
Objectives: Understanding and analyzing these experiences is crucial for improving disease management practices and supporting healthcare workers in correctional settings.
Methods: A phenomenological design with maximum variation sampling was employed, and the researchers interpreted the nurses' experiences using Colaizzi's 7-step process. Two main themes emerged: strategies and management, and challenges and barriers behind bars.
Results: Strategies and Management: This theme includes the necessity for healthcare workers to prioritize physical well-being, utilize telehealth, adhere to protocols, communicate effectively, and engage in compassionate care and teamwork. Challenges and Barriers: This theme reflects the obstacles faced by nurses in providing healthcare within the constraints of the correctional environment.
Conclusions: The findings can inform correctional facilities and jail nurses on improving healthcare for Persons Deprived of Liberty (PDLs). Additionally, the study offers effective strategies for managing diseases in correctional settings, providing insights that can enhance practices across Bureau of Jail Management and Penology (BJMP) offices. The insights from this study support several Sustainable Development Goals (SDGs), including improving healthcare access and outcomes (SDG 3), enriching nursing education (SDG 4), promoting equal healthcare access (SDG 10), improving working conditions (SDG 8), fostering interprofessional collaboration (SDG 17), and promoting equal access to justice (SDG 16).

Enhancing accessibility and affordability of medical commodities in low and middle-income countries: the case of Chinese pharmaceutical and medical companies in the WHO prequalification program for antimalarial medicines and ITNs

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Background: The participation of Chinese pharmaceutical and medical companies in the World Health Organization (WHO) Prequalification Program aims to enhance the accessibility and affordability of antimalarial medicines and insecticide-treated nets (ITNs) in low and middle-income countries (LMICs). This study investigates the impact of this participation on the availability, affordability, and quality of these medical commodities.
Objectives: This research aims to assess the overall impact of Chinese pharmaceutical and medical companies' participation in the WHO Prequalification Program on improving the accessibility, affordability, and quality of antimalarial medicines and ITNs in low and middle-income countries.
Methods: A mixed-methods approach was employed, incorporating quantitative data from qualitative insights from interviews with key stakeholders in Chinese pharmaceutical firms. Statistical analyses were performed to evaluate changes in market prices and accessibility metrics before and after the companies' participation in the WHO Pre-qualification Program.
Results: The study found an increase in the availability of WHO-prequalified antimalarial medicines and ITNs in LMICs. Prices of these commodities decreased, making

them more affordable. Additionally, Chinese pharmaceutical companies improved their production standards and quality control practices, aligning them with international benchmarks. Enhanced distribution networks were also established, leading to better accessibility in remote areas.
Conclusions: Participation in the WHO Prequalification Program by Chinese pharmaceutical and medical companies have markedly improved the availability, affordability, and quality of antimalarial medicines and ITNs in LMICs. These improvements have positively impacted public health outcomes in these regions, suggesting the program's crucial role in global health initiatives.

Feasibility of smartphone-based chatbot intervention to promote influenza and Covid-19 vaccination in South Asians ethnic minorities

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Background: Influenza and COVID-19 share many characteristics, and another wave of COVID-19 is expected to coincide (at least in part) with the spread of seasonal influenza in the coming years. Vaccination is one of the most effective ways to prevent the unnecessary spread of vaccine-preventable diseases. However, vaccination rates among South Asian ethnic minorities remain suboptimal. Smartphone- based chatbot intervention may offer promising opportunities to provide vaccine knowledge and address barriers experienced by ethnic minorities.
Objectives: This pilot trial aimed to evaluate the feasibility and preliminary effects of smartphone-based chatbot intervention on influenza and COVID-19 vaccine uptake, intention to receive vaccination and vaccine hesitancy amongst South Asian ethnic minorities in Hong Kong.
Methods: An assessor-blinded, cluster-randomised, waitlist-controlled trial were conducted. A total of 36 South Asians were recruited from each of the 6 participating ethnic minorities associations. They were randomly allocated to intervention or waitlist control group. The intervention group received the smartphone-based chatbot intervention. The waitlist control group received usual care only. Feasibility parameters such as screening, eligibility, consent, and withdrawal rates during recruitment, and attrition rate were assessed. Outcome measures including the intention and actual uptake of Covid-19 and influenza vaccination were assessed at baseline and immediately post- intervention.
Results: The results demonstrated that the intervention was feasible as evidenced by the high eligibility rate (86%), consent rate (100%) and low withdrawal (0%) and attrition rate (3%). The intervention group showed statistically significant improvements in Covid-19 and influenza vaccination intentions between groups. However, there was no significant difference in vaccination rates.
Conclusions: Findings support the feasibility of smartphone-based chatbot intervention and provide preliminary evidence of its effectiveness on enhancing the vaccination intention. A future study with a larger sample size and longer follow-up period is warranted.

Leveraging digital transformation by introducing a routine birthing experience monitoring tool to strengthen breastfeeding-friendly health systems in Cambodia, Laos, and Vietnam

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Background: Although breastfeeding is crucial for mothers, children, and planetary health, breastfeeding rates remain low globally and in low-middle-income countries such as Cambodia, Laos, and Vietnam. The Baby-Friendly Hospital Initiative (BFHI), established by the World Health Organization and United Nations Children's Fund in 1991, aims to develop breastfeeding-friendly health systems. In 2018, updated BFHI guidelines urged countries to integrate the initiative into their national health systems. However, guidance on achieving integration was not provided, leaving countries to develop their own implementation models.
Description: Alive & Thrive has collaborated with governments and local partners to revise the national BFHI implementation guideline and implement a novel model named Centers of Excellence for Breastfeeding (COE), integrating BFHI into the national systems of Cambodia, Laos, and Vietnam. A notable feature of the model is the Birthing Experience Monitoring Tool, which routinely collects mothers' feedback on the quality of breastfeeding support and early essential newborn care (EENC) they received at the hospital. Digitalizing the tool allows health managers and practitioners to receive real-time feedback from mothers about adherence to the International Code of Marketing of Breast- Milk Substitutes and quality of care during the antenatal, childbirth, and postpartum periods from facility to national level. Since 2019, over 40,000 mothers have shared their experiences using the tool. Ninety-four hospitals in these countries enrolled in the initiative, with 44 designated as COE, benefiting over 250,000 mothers in the Sub-Mekong Region.
Lessons Learned: Key lessons include integrating the initiative into the national health system, ensuring government ownership and leadership, and utilizing feedback from mothers and families to motivate and hold

health providers accountable for delivering quality care services.
Next Steps: Future actions involve linking hospital quality standards with the social health insurance system to incentivize health providers' behavior changes, ensuring universal health coverage for quality breastfeeding and EENC.

Climate-induced health risks and the physical and mental health of Asian migrants: a scoping review
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Background: Climate change is increasingly recognized as a significant driver of migration and as a key determinant of health outcomes for vulnerable populations. International organizations are beginning to recognize and develop policy to address the intersection of climate change, migration, and health. Despite extensive research on the health impacts of climate change on global migrants, there is a notable gap in the literature regarding Asian migrants. This scoping aids will fill this critical gap by synthesizing the available literature and on climate-induced health risks and their effect on the physical and mental health of Asian migrants.
Objectives: To identify and synthesize existing research on the health outcomes of Asian migrants affected by climate change. To highlight gaps in the current literature and provide recommendations for future research and policy development.
Methods: This review follows the PRISMA guidelines for scoping reviews. A comprehensive literature search will be conducted across multiple databases, including PubMed, Scopus, and Web of Science, including peer-reviewed articles as well as grey literature published up to September 2024. The search will utilize keywords and search strategies co-developed with a research librarian and will cover health outcomes (mental health, wellbeing, infectious disease), and climate-related events (floods, typhoons, temperature), migration types (forced displacement, internal, international) among Asian migrants. Studies on occupational hazards unrelated to climate will be excluded.
Results: Preliminary searches revealed that Asian migrants experienced increased mental health burden, a higher incidence of infectious diseases, and overall reduced well-being. The review will uncover significant research gaps, particularly concerning older migrants and long-term health consequences.
Conclusions: This review fills a critical gap in the literature by detailing the health effects of climate change on Asian migrants. Preliminary findings underscore the need for targeted research and culturally sensitive health policies to address this population's unique vulnerabilities, offering key insights to improve migrant-friendly health systems.

Cultural humility and sensitivity in global health education
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Background: Timor Leste, a beautiful young nation that gained independence in 2002, has faced challenges in developing a robust health system. Geographical challenges with isolated communities scattered throughout the country make access to healthcare difficult. Being a newly independent country, healthcare workforce shortage and heavy reliance on foreign aid has brought on concerns of sustainability in healthcare financing.
Description: Project Yangon (PY) is a project based in the National University of Singapore. The project used to serve citizens of Yangon, Myanmar. Political instability made it difficult for students to return to the country to continue health screening efforts. In 2024, PY decided to pilot a new learning project. Together with faculty project mentors and PY student leaders, a 1 week program to learn about Timor Leste was co-created. A week was spent on learning about Timor's struggles during occupation, as well as current challenges faced in their healthcare systems.
Lessons Learned: Through the trip, we learned about hurdles faced in health education in various cultures, where local cultural beliefs which conflict with Western science must be respected and reconciled. Simply overriding their long-held beliefs with a top-down approach can result in resistance from locals who may view us as foreigners with a saviour mindset. We also saw the close ties that healthcare had with other social sectors such as education, politics, landscape and transport infrastructure - especially in resource-limited countries - and discussed with local experts on how resources could be best allocated.
Next Steps: Moving forward, the project wishes to delve even deeper. Other than cultural and historical learning to develop cultural humility and sensitivity, another week will be spent on the ground with local NGOs such as SABEH (Saúde Ba Ema Hotu) to travel to rural towns, helping on the ground with health screening and home visits. We hope this will enhance our learning

The impact of technology on radiology services: an action research study in a Malaysian distract hospital
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Background: Radiology services are essential for disease diagnosis, treatment monitoring, and prognostic assessment. However, despite the introduction of Radiology Information Systems (RIS) and Picture

Archiving and Communication Systems (PACS), many hospitals in Malaysia still rely on manual workflows due to slow digital adoption and economic constraints. These challenges have led to operational inefficiencies, increased workloads, and strained resources, highlighting the need for digital solutions.

Objectives: This study aimed to identify perceived factors contributing to work process inefficiencies in the radiology department and to evaluate the impact of implementing an information system (IS) and PACS in a district hospital.

Methods: Conducted from November 2022 to December 2023 in a district hospital in northern Malaysia, the study utilized a single-cycle Action Research (AR) approach. Data collection involved semi- structured interviews, observations, survey questionnaires, and documentary research. Data analysis included thematic analysis to identify underlying inefficiencies, while process mapping, descriptive statistics for survey data, and expense comparisons were used to assess the effectiveness of the intervention.

Results: Work process automation through IS implementation significantly reduced bottlenecks, resulting in a 63% decrease in estimated patient waiting times and a 79.4% reduction in operational costs in 2023 compared to the previous year. Survey results revealed high user satisfaction, with 73.9% of respondents acknowledging improved workflow efficiency (mean = 3.86), 73.2% expressing confidence in using the system (mean = 3.87), 69.8% reporting a positive impact on patient care (mean = 3.98), and 70.6% recommending the continued use of the IS (mean = 3.97).

Conclusions: The implementation of RIS and PACS significantly enhanced the operational efficiency of the radiology department, underscoring the importance of digital integration in healthcare. This study offers a scalable and cost-effective model for other public hospitals in Malaysia, demonstrating that leveraging existing infrastructure and adopting a user-centered approach can facilitate digital transformation even in the face of financial constraints.

Effects of immersive virtual reality intervention for alleviating anxiety and nausea among paediatric cancer patients undergoing chemotherapy: a randomised controlled trial

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Background: Children with cancer often experience high levels of anxiety and nausea, especially during their first chemotherapy treatment. These distressing symptoms can negatively impact their overall well-being and treatment outcomes. Recently, immersive virtual reality (IVR) has emerged as a promising tool in healthcare, providing an immersive experience that can distract children during painful and invasive procedures. However, the effects of IVR intervention on anxiety and nausea levels in paediatric cancer patients receiving chemotherapy has not been extensively investigated.

Objectives: This randomised controlled trial investigated the effects of an IVR intervention in reducing anxiety and nausea in paediatric cancer patients undergoing chemotherapy for the first time.

Methods: A randomised controlled trial was conducted. Paediatric cancer patients aged 6 to 12 years who had not previously received chemotherapy and were scheduled to receive their first chemotherapy were recruited from a public hospital. Participants were randomly assigned to an intervention or control group. The intervention group received three IVR intervention sessions, while the control group received only standard care. Patients' anxiety and nausea levels were assessed using the short form of the Chinese version of the State Anxiety Scale for Children and the Visual Analogue Scale, respectively.

Results: A total of 96 children were recruited. Data analysis showed that the anxiety and nausea scores of participants in the intervention group were significantly lower than those in the control group. There was no significant difference in number of vomiting episodes.

Conclusions: This trial demonstrates the effects of a IVR intervention in reducing anxiety and nausea levels in paediatric cancer patients undergoing chemotherapy. The results will lay the foundation for future research and clinical application of IVR.

Better health starts with her: a community-led women's health initiative in Kibera, Kenya

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Background: Gender disparities and inequities in low and middle-income countries, including Kenya, pose substantial barriers to women's health. In Kibera, an informal settlement in Nairobi, young women and girls face heightened risks of teenage pregnancies, sexually transmitted infections, and gender- based violence due to a lack of access to reproductive health, family planning, and menstrual hygiene services.

Objectives: Despite efforts to support women and girls, significant research and intervention gaps remain. To address this, youth public health ambassadors will gather data that identifies and describes women's health-related knowledge and behaviors, environmental factors that contribute to local health challenges, and the existing

community assets and resources that can be mobilized to improve women's health throughout the communities.
Methods: This study consisted of a cross sectional community health assessment. Research was conducted in six of the thirteen geographical sub-locations or villages of the Kibera and included 100 survey participants and 3-5 health care facilities per village. Data was collected using paper questionnaires. Frequencies, percentages, and other descriptive and graphical statistics will be calculated to understand knowledge, attitudes, and beliefs relating to women's health issues as well as barriers to health promoting behaviors. Logistic regression analysis will be used to assess predictors of specific health behaviors with a level of significance set at $P < 0.05$.
Results: Initial research findings have indicated stigmatized beliefs regarding women's reproductive health and early pregnancy. Preliminary qualitative findings also suggest that there are moderate to low levels of health literacy regarding the transmission of sexually transmitted infections, methods of contraception and healthy pregnancy. These findings suggest a desire for more sexual and reproductive health education and resources.
Conclusions: The data highlights a need for women's health interventions in villages in Kibera. The results reveal gaps in services, access, and knowledge in pregnancy, poverty, and health-related behavior which should be addressed in future interventions.

AI-driven discovery of a novel T cell origin as effective immunotherapy for lung cancer

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Background: T cell-based immunotherapies are effective for blood cancers but show low efficiency in solid tumors.
Objectives: Single-cell RNA-sequencing (scRNA-seq) can retrospectively capture the dynamics of T cells at the transcriptome level, allowing us to better understand their development in solid tumor.
Methods: By using transformer-based artificial intelligence (AI) tools, we analyzed scRNA-seq data by converting gene expression information into gene set tokens to identify cell types and developmental trajectories.
Results: Surprisingly, we discovered a novel T cell population in non-small-cell lung carcinoma (NSCLC), which is absent in leukemia and positively associated with better survival of solid cancer patients. Advanced bioinformatics and fate-mapping studies experimentally further confirmed this T cell type originated from a novel origin. This novel T cell type showed strong anti-tumor activity against syngeneic lung cancer LLC and melanoma B16F10 in vivo and in vitro, highlighting their clinical potential for solid tumor immunotherapy. Mechanistically, we identified a conserved pathway for blocking their development in tumor, which can be targeted by pharmaceutical inhibition in vivo.
Conclusions: Most importantly, we successfully engineered and mass-produced this new T cell type from human peripheral blood in vitro which effectively blocked human NSCLC progression in vivo, representing a novel and effective immunotherapy for solid tumors.
Acknowledgement: This study was supported by Research Grants Council of Hong Kong (14111720, 24102723, 14107624); RGC Postdoctoral Fellowship Scheme (PDFS2122-4S06); Health and Medical Research Fund (10210726, 11220576); Innovation and Technology Fund (ITS/177/22FP, ITS/016/23MS), CU Medicine Passion for Perfection Scheme (PFP202210-004) and Faculty Innovation Award 2019 (4620528), CUHK Strategic Seed Funding for Collaborative Research Scheme (178896941), Direct Grant for Research (2024.090), and Postdoctoral Fellowship Scheme (NL/LT/PDFS2022/0360/22lt, WW/PDFS2023/0640/23en)

AI-driven discovery of a novel neuroimmune axis in non-small cell lung cancer

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Background: Tumor innervation is increasingly recognized as a clinically interesting phenomenon relevant to cancer progression, but its therapeutic target in solid tumors remains largely unclear. Recently, we discovered a novel neurogenic pathway of tumor innervation, "Macrophage to Neuron-like cell Transition"(MNT), in which tumor-associated macrophages can differentiate into neurons in non- small cell lung cancer (NSCLC).
Objectives: A better understanding of the regulatory mechanisms of MNT may lead to effective tumor denervation treatment strategies in the clinic. However. traditional cellular deconvolution approaches fall short of providing the detailed resolution required for single-cell-level analyses.
Methods: We introduce an innovative computational framework, 'Compound AI System', that marries several deep generative models with active learning strategies, empowering refined cellular analyses.
Results: Surprisingly, we discovered a macrophage marker

was specifically expressed in tumor-associated neurons. GO terms of its upregulated genes showed a significant relationship with the nervous system development, revealing a potential role of this macrophage marker in neurogenesis. Fate- mapping studies found that this marker is highly expressed in the MNT-derived neurons, whereas other macrophage characteristics are absent after transformation, representing an ideal biomarker for tracking MNT-driven tumor innervation. Encouragingly, gene silencing of this marker effectively blocked MNT, tumor innervation, and cancer progression in mice bearing syngeneic lung cancer tumor LLC or human NSCLC xenograft A549, highlighting its translational potential for clinical cancer therapy.

Conclusions: Thus, we successfully discovered a novel neuroimmune axis in macrophages for driving tumor innervation, which may represent a safe and effective therapeutic target for clinical NSCLC. Acknowledgement: This study was supported by Research Grants Council of Hong Kong(14111720,24102723,14107624); RGCPostdoctoral Fellowship Scheme(PDFS2122-4S06); Health and Medical Research Fund(10210726, 11220576); Innovation and Technology Fund(ITS/177/22FP,ITS/016/23MS), CU Medicine Passion for Perfection Scheme (PFP202210-004) and Faculty Innovation Award 2019(4620528), CUHK Strategic Seed Funding for Collaborative Research Scheme(178896941), Direct Grant for Research(2024.090), and Postdoctoral Fellowship Scheme(NL/LT/PDFS2022/0360/22lt,WW/PDFS2023/0640/23en)

Strengthening health systems and financing one district at a time: success of the Konsula Primary Benefit Package Demonstration in Agdao District, Davao City

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Background: The Philippines' Universal Health Care (UHC) Law aims to provide equitable access to quality healthcare for all. One of its intended outcomes is strengthening the country's health systems, with efficient and sustainable primary care systems at its core.

Description: USAID's ProtectHealth assisted Davao City in their efforts to accelerate and scale up the implementation of PhilHealth's Konsulta Benefit Package, which aims to provide all Filipinos with access to a comprehensive package of high-quality primary care services without causing financial hardships, with a focus on vulnerable populations. The project employed a multi-faceted demonstration study approach encompassing comprehensive assessment, stakeholder engagement, capacity building of primary care navigators, process streamlining, and robust monitoring and evaluation. As a result, Konsulta beneficiaries surged from 403 in June 2022 to 261,724 by July 2023, with first patient encounters increasing from zero to 18,323 within the same period.

Lessons Learned: This study demonstrates the feasibility of scaling up primary care services for UHC implementation, mainly through the following: 1. Comprehensive assessment of the local health systems via systems approach 2. Continuous collaboration with all the stakeholders 3. Community-based primary care navigation 4. Streamlining processes in the primary care facility 5. Conduct of supportive supervision of local Konsulta implementers 6. Continuous policy and operational resolution

Next Steps: Davao City aims to continue scaling up the interventions through the lessons learned during the demonstration study in the context of the six building blocks of health systems: service delivery, financing, governance, human resources, information systems, and access to medicines.

Equity in health financing towards universal health coverage in China

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Background: Equity in health financing is essential for achieving universal health coverage (UHC). Assessing and decomposing the progressivity of the health financing system could identify the sources of inequity within the system and inform evidence-based policy improvements.

Objectives: This study aims to assess the equity of China's health financing system by evaluating the distribution of the benefits and burdens across socioeconomic groups before and after the 2009 healthcare reform.

Methods: Nationally representative household survey data from the Chinese Household Income Project (2007- 2018) were utilized to conduct financing incidence analysis and benefit incidence analysis. The progressivity of the overall financing system and each financing source was measured with the concentration index and the Kakwani index (KI). The distribution of benefits from utilizing publicly funded health services across health need was evaluated using the concentration curve and the concentration index. Data were aggregated to household-level and adjusted by adult equivalence.Sensitivity analyses using different household ability-to-pay measures were also performed.

Results: The overall health financing system transitioned from slightly progressive in 2007 (KI 0.005, 95% CI 0.004 to 0.006) to moderately regressive in 2013 (KI -0.063) and 2018 (KI -0.087). Direct tax payments and out-of-pocket payments remained progressive, while indirect tax

payments and social health insurance premiums contribute to regressivity. The distribution of benefits from public funding did not align with healthcare needs. The wealthiest 20% of the households bore only 11.8% of the health burden but received 52.9% of the benefits in 2007. Equity improved by 2018, but the results remained unequal. Significant urban-rural disparities were also found in both health financing burdens and benefits.
Conclusions: This study underscores the need for policy adjustments to enhance the equity of China's health financing system, also providing insights for other developing nations pursuing UHC.

University students' perceptions for healthy ageing in the Asia-Pacific: a content analysis
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Background: Population ageing is a global phenomenon. The WHO's Decade of Healthy Ageing, known as the Decade, underscores the value of building age-friendly environments, combatting ageism, and improving care for older adults.
Objectives: We aimed to explore university student-created insights of how aging is perceived in the Asia-Pacific and the Americas, and define strategies that may successfully engage youths in promoting healthy aging, now and in the future.
Methods: Twenty-eight teams of students from ten Asia-Pacific economies participated in the APRU Global Health Case Competition, which focused on improving older adult care. We performed a content analysis of video proposals, applying the Decade's four key action areas as a novel way to examine student perceptions of healthy ageing.
Results: Regarding the Decade, most proposals addressed integrated healthcare and age-friendly environments, but few addressed long-term care and/or ageism. Social isolation was a priority, with proposals commonly featuring technological tools and socially supportive spaces for older adults and carers as solutions.
Conclusions: Students valued technology-based strategies and socially connected environments to promote mental health and active ageing as critical components of healthy ageing. The results demonstrated the need for programs that counter ageism.

Strengthening integrated heath care system for older people in Indonesia: case study in Depok city. Development of a transitional care model for Geriatric Patients based on family care
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Background: Indonesia's older people population currently reaches 11.75% of the total population. This proportion has brought Indonesia into the category of an aging society. The aging process causes the elderly to experience a decrease in functional capacity which has an impact on the emergence of various health problems, causing the elderly to experience various diseases and even become dependent and require long-term care. With the occurrence of an aging population, the nature of health care has been affected.
Objectives: Long-term care services for older people have become an absolute necessity in the health care system. However, not all care facilities have practiced this health service system. This study intended to identify the integrated care system model for older people.
Methods: This study used a qualitative approach with exploratory case studies in Depok City West Java Indonesia. This study gathered the initial evidence using a report with In-depth interviews and focus group discussions carried out to understand the health care system and the model of transitional care for the elderly.
Results: The results indicate that family-based care is a suitable model for transitional care services for geriatric patients. It's supported by the role of all service systems in Depok City which includes the role of the Hospital through a home care program with good discharge planning, the role of the Health Office in Primary Service Integration, the role of Public Health Service through life cycle posyandu, the role of National health insurance through the Referral Program, the role of the Social Service for neglected elderly, the role of elderly family development program from the National Population and Family Planning Agency, the role of religious leaders in fostering elderly families, and the role of NGOs program.
Conclusions: This model is expected to be an initial form that needs further testing to get a more integrated system.

Nanoparticle technology to enhance HIV ART drug-delivery
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Background: The emergence of drug-resistant and the long-term use of HIV ART is also often associated with systemic toxicity, leading to adverse effects on organs such as the liver, kidneys, and cardiovascular system. The persistence of latent reservoirs, primarily located in CD4+ T cells and macrophages, harbor replication-competent HIV that can evade immune detection and remain unaffected by antiretroviral therapy.
Description: This project focuses on leveraging nanoparticle drug delivery systems to improve the efficacy and safety of ART. Nanoparticle technologies such as liposomes, dendrimers, and polymeric nanoparticles, are each engineered with specific physicochemical properties

to enhance drug delivery to the virus's cellular reservoirs including CD4+ T cells and macrophages. PEG conjugation, a surface modification technique, extends the circulation time of nanoparticles by reducing their recognition and clearance by the immune system, thus increasing the likelihood of reaching the target cells. Ligand-receptor targeting involves attaching specific ligands to the nanoparticle surface that bind to receptors over-expressed on HIV-infected cells, such as CD4 or CCR5. This targeted delivery ensures that antiretroviral drugs are efficiently transported to infected cells, thereby improving therapeutic efficacy while minimizing off-target effects. The embedding of CRISPR/Cas9 gene-editing technology within these nano-carriers allows for the precise targeting and excision of latent viral DNA integrated into host genomes.

Lessons Learned: Nanoparticle-based systems improved pharmacokinetic profiles by increasing their bioavailability and sustaining drug release, achieving 3.5-fold higher drug concentrations at infection sites. Optimization of physicochemical properties, such as size and surface charge, improved targeting of CD4+ T cells and macrophages. Integration with CRISPR/Cas9 demonstrated a 60% reduction in latent viral reservoirs, directly intervening in the host genome to remove proviral DNA.

Next Steps: The focus will be on the safety of nanoparticle constructs, with initial clinical trials assessing their pharmacological and toxicological profiles in human subjects, including biocompatibility and dosage to avoid toxicity.

Happy CP gloves: innovative and sustainable solutions for alleviating hand spasticity in children with cerebral palsy

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Background: Cerebral palsy (CP) is a group of lifelong movement disorders caused by brain damage from birth asphyxia, significantly affecting muscle coordination, tone, and sensory development in early childhood. Addressing the unique challenges faced by children with CP, "Happy CP Gloves" were developed as innovative medical devices that also serve as instruments of hope, happiness, and developmental support for children and their caregivers.

Description: Happy CP Gloves aim to alleviate hand and wrist spasticity in children with cerebral palsy. Developed through collaboration with medical experts and toy specialists, these gloves combine therapeutic benefits with playful engagement. The design includes a turtle doll that emits sound and releases eggs in response to spasticity, offering tactile feedback for caregivers. Since August 2023, 2,000 sets have been distributed, funded by donations via Taejai.com.

Lessons Learned: User feedback surveys, with 69 participants including parents, physical therapists, and caregivers, revealed high satisfaction rates: - 75% of respondents were highly satisfied with the gloves' overall functionality. - 55% noted a significant reduction in hand and wrist spasticity. - 74% agreed that the gloves were comfortable for children. - 83% found the gloves easy to put on and take off. - 88% praised the gloves' engaging design as highly interesting for children. These results highlight the importance of integrating therapeutic benefits with playful engagement to foster happiness, learning, and positive caregiver-child relationships.

Next Steps: Based on positive feedback, we will collaborate with private sectors to produce Happy CP Gloves using sustainable practices, including reusing cloth, and recycling plastic. We will refine the design for improved functionality and comfort, offer different sizes, and develop more engaging designs. Continued consultations with caregivers and medical experts will ensure high standards of effectiveness and user satisfaction. Our goal is to expand the impact of this solution, spreading joy and hope to more families globally.

Mascot magic or sporting spectacle?: an interrupted time series analysis with social listening tools to assess the effects of social events, Butterbear and Euro 2024, on Thailand's mental wellbeing in the digital era

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Background: Mental health is a major public health issue in Thailand. In June and July 2024, Butterbear (a popular commercial mascot in the Thai society) and Euro-2024 (European football tournament) were top trends.

Objectives: By leveraging social listening tools to analyze online entertainment target population, this study aimed to assess the gender, age-specific and geographic exposure of both the Butterbear and Euro 2024 and evaluated possible effects on mental wellbeing in Thailand.

Methods: We applied observational quasi-experimental design with interrupted time series analysis (ITSA) to compare mental wellbeing impacts across gender, age, and regions. Data from the Mental Health Check-in (MHCI),

during January 2020 - July 2024, were analyzed for stress, depression, and suicide risk. Google Trends and social media analytics (Wisesight Trend) provided engagement data. SARIMAX models, incorporating socioeconomic indicators, were used for ITSA.

Results: Totally, 5,499,170 responses were recorded in MHCI. High stress, depression, depression, and suicide risk were reported by 7.76%, 5.17%, and 9.11% of respondents. Butterbear and Euro-2024 keywords were searched 631,414 and 1,975,759 times, with an upward **trend** since June 2024. Significant female engagement for Butterbear, and male engagement for Euro-2024 in aged 18-34 years were observed (61.54% of entertainments). With social events, ITSA showed improvement of mental wellbeing indicators among females in Bangkok aged 18-34 years: stress (-17.98%), depression risk (-22.76%), and suicide risk (-18.04%), compared to predicted values.

Conclusions: The study trends suggested global mental health impacts from social events, influenced by media consumption. Leveraging popular phenomena like Butterbear and Euro 2024 could enhance mental wellbeing and could be utilized as part of health promotion campaigns.

Enhancing digital disease surveillance in Thailand using information technology, data engineering, data science, and artificial intelligence

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Background: Recent advancements in information technology, data engineering, and data science have revolutionized disease surveillance systems globally.

Objectives: This study examines the implementation of these advancements in Thailand, highlighting strategies, technologies, and challenges in enhancing public health monitoring and response capabilities.

Methods: We integrated these advancements to enhance the four key steps of public health surveillance: data collection, data analysis, data interpretation, and data dissemination. We expanded data collection to include data environment and integration, designing systems to manage multiple sources and facilitating seamless integration. To support analysis and interpretation, we adopted design thinking approach and developed intuitive tools for exploring magnitude and distribution. For data dissemination, we identified target users and described data distribution mechanism.

Results: We integrated three major surveillance systems: digital disease surveillance connecting data from 2,674 facilities via application programming interface, syndromic surveillance, and event-based surveillance. Data environments were divided into clusters for extraction, integration, and data mart for specific use cases. Automated hourly extract-transform-load processes using Apache Airflow facilitated real-time data integration, ensuring seamless data management and timely updates. Data analysis solutions, included automated validation algorithms and business intelligence tools with user-friendly interfaces, were developed according to findings from design thinking workshop using Python and Tableau. For dissemination, we developed open (for everyone) and closed data systems (for officers), with open data published on dashboards and closed data managed through the authenticated Digital Export System. Data anonymization was ensured through deletion, encryption, and aggregation. Early warning systems, namely D.alert, established a notification of outbreak to public health authorities via LINE application. Lastly, large language model with retrieval augmented generation and text2SQL were implemented to develop chatbot to enhance public communication.

Conclusions: The integration of IT, data engineering, and data science has significantly enhanced Thailand's disease surveillance, improving data collection, analysis, interpretation, and dissemination, leading to more efficient public health responses.

A comprehensive analysis on colorectal cancer burden associated with diet low in milk, 1990- 2021

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Background: Colorectal cancer is one of the most common types of cancer which starts in the colon or rectum. A balanced diet with specific vitamins and minerals might lower the risk of cancer, and milk is one of the critical sources of essential vitamins and minerals. Understanding the relationship between a low- milk diet and colorectal cancer

burden can guide policy-making, enhance health outcomes, and reduce cancer burden.

Objectives: This study aims to investigate the trend of milk consumption rates, as well as the disease burden of colorectal cancer attributable to diet low in milk.

Methods: The data was obtained from the Global Burden of Disease dataset. We analyzed and visualized the milk consumption rate, the number and rate of deaths, and DALYs due to the risk factor - a diet low in milk for two genders, 204 counties, and territories during 1990–2021.

Results: Between 1990 and 2002, milk consumption rose slightly before significantly dropping to 80.79 g/day by 2021. The age-standardized DALYs rate of colorectal cancer due to diet low in milk decreased from 1990 to 2021, dropping from 51.52 (95% UI 14.33–84.17) to 42.99 (95% UI 11.73–71.23) per 100,000 people in 2021 with total DALYs increasing. Females consistently had higher DALYs rates than males. Countries with higher SDI had higher DALYs rates, with high-middle SDI countries having the highest in 2021.

Conclusions: The decreasing age-standardized DALYs rate reflects a declining trend of colorectal cancer burden, indicating the improvement of health outcomes. This study illustrates the association between a diet low in milk and cancer burdens across different genders and countries, studying the underlying reasons. By informing public health organizations and policy-makers of the recommended daily milk consumption for colorectal cancer patients across various genders, countries, and territories, this information can effectively reduce the colorectal cancer

The global burden of lung cancer attributable to ambient particulate matter pollution: a comprehensive analysis from the Global Burden of Disease Study 2021

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Background: Exposure to particulate matter pollution leading to respiratory cancer continues to be a global health concern. The ongoing impacts of climate change, as well as rapid industrialization and urbanization are worsening current air conditions, leading to increased concentrations of PM2.5, and decreased overall air quality.

Objectives: Evaluations of these burdens can help better understand socioeconomic and environmental factors to better improve policy and advocacy for environmental and public health.

Methods: The Global Burden of Disease (GBD) Study 2021 was used to assess the burden of tracheal, bronchus and lung (TBL) cancer. Analysis on the risk factor of PM2.5 in different socio-demographic regions, sex differences, age groups, deaths, and disability-adjusted life years (DALYs) were examined from 1990 to 2021.

Results: Globally, PM2.5 contributed to an estimated 374.2 thousand (95% UI [236.4 – 520.3 thousand]) cancer deaths and 8.9 million (95% UI [5.7 – 12.4 million]) cancer DALYs in 2021. TBL cancer specifically, was highest in high-middle SDI regions, with 124.5 thousand (95% UI [79.1 – 176.6 thousand]) deaths and 2.9 million (95% UI [1.8 – 4.1 million]) DALYs in 2021; however, the age- standardized death and DALY rates declined from 1990 to 2021, decreasing by 32% and 40% respectively. Across all SDI regions, males experienced greater deaths and DALYs than females. Globally, males had age-standardized rates of 6.37 (95% UI [3.97 – 9.03]) deaths per 100,000 persons and 146.93 (95% UI [91.82 – 207.58]) DALYs per 100,000 persons in 2021. Comparatively to females, with 2.63 (95% UI [1.64 – 3.64]) deaths per 100,000 persons and 62.00 (95% UI [39.07 – 86.08]) DALYs.

Conclusions: Particulate matter pollution has contributed considerably to TBL cancer, evidently threatening human health. Specifically, in high-middle income countries, males, and ages 65-74. This poses the urgency for prevention policies in both ecosystem and public health campaigns.

The Global Burden of cancer attributable to high fasting plasma glucose: a comprehensive analysis of distributions and trends from 1990 to 2021

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Background: High fasting plasma glucose (HFPG) is rapidly emerging as a public health concern globally through a mix of factors such as urbanization, unhealthy diets, aging, and sedentary lifestyles. Previous studies have pointed towards an association between HFPG and cancers.
Objectives: This study aims to assess the trends and burden of cancer attributable to high fasting plasma glucose.
Methods: This study utilized data from the Global Burden of Disease (GBD) 2021 study to obtain data regarding cancer-related deaths and disability-adjusted life years (DALYs) attributable to HFPG from 1990 to 2021 for 204 countries.
Results: In 2021, there were an estimated 328,308 (95% UI: 35,241 to 629,883) deaths and 7,051,196 DALYs (707,114 to 13,622,171) attributable to cancer associated with HFPG. Males experience a slightly higher burden of cancer due to HFPG than females with 172,793 (23,021 to 327,552) deaths and 3,766,200 (521,980 to 7,137,681) DALYs compared to females with 155,515 (12,391 to 302,095) deaths and 3,284,995 (187,142 to 6,475,538) DALYs in 2021. DALYs have increased steadily for all age groups since 1990 with the highest rates of DALYs found in older age groups, the age group with the highest rate in 2021 is 80-84, followed by 75-79 and 70-74 age groups. Pancreatic cancer has been the most commonly associated type of cancer with HFPG since 1990 and accounted for 26.31% (3.03% to 49.86%) and 24.32% (2.81% to 46.10%) of age-standardized deaths and DALYs respectively in 2021.
Conclusions: The study reveals a rising burden of cancers attributable to high fasting plasma glucose (HFPG). Our findings indicate that this burden is particularly pronounced among males, older populations, and countries with a high SDI, with pancreatic cancer being the most common manifestation. Consequently, it is imperative for policymakers and healthcare authorities to urgently intensify efforts to prevent and manage HFPG to curb this growing health challenge.

A comprehensive analysis of epidemiological trends of mental disorder health burden attributed to bullying victimization

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Background: Bullying victimization affects children and adolescents aged 5-19 with experiences of physical, verbal, relational, and cyberbullying, posing increasing risk of mental disorders, with lasting impacts beyond adulthood. Despite being a pressing public health concern, the epidemiological trends are still not yet fully understood.
Objectives: This study therefore investigates mental disorders due to bullying victimization prevalence worldwide and their corresponding implications, aiming to identify pain points for prevention and intervention measures.
Methods: The burden of mental disorders attributable to bullying victimization was assessed through the Global Burden of Disease Study. We compared the sex, age, and regional specific burden from 1990 to 2021.
Results: The global rates of bullying victimization-induced mental disorders show an overall increasing trend, from 64.66 (95% UI [26.42–128.27]) in 1990 to 79.44 (95% UI [34.80–152.77]) in 2021. Furthermore, higher male DALYs rates are also consistently observed. Among different age groups, individuals of 20-24 years old are found with a DALYs rate of 213.36 (95% UI [91.20–414.16]. Additional SDI country analysis shows the highest DALYs rates in High SDI countries at 107.71 (95% UI [47.72–202.36]) and the lowest DALYs rates for Middle SDI countries at 68.71 (95% UI [28.37–136.86) in 2021. Moreover, further country-specific analysis reveals that Greenland has the highest rates of bullying victimization-induced mental disorders, with a DALYs rate of 255.93 (95% UI [155.22–450.91]).
Conclusions: It is evident that there is a global rise in mental disorders attributed to bullying victimization, with prominent DALYs rate in males and the age group of 20-24 years old. The potential factors include work-related stress, environmental changes, social isolation challenges and stigma, etc. This study therefore examines the epidemiological trends of bullying victimization-induced mental disorders, providing insights to assist in the development of prevention and intervention policies.

The global burden of depression attributable to childhood sexual abuse: evidence from the Global Burden of Disease 2021

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Background: Childhood sexual abuse is a significant risk factor for depression and other mental health issues. As childhood sexual abuse (CSA) becomes more prevalent, the associated risk of developing depression increases. However, the health losses from this condition remains understudied, hindering proper treatment and intervention.
Objectives: The current study aims to assess the global burden of depression due to CSA.
Methods: From 1990 to 2021, the study used data on disability-adjusted life years (DALYs) from the Global Burden of Disease (GBD) databases. We compared temporal trends across sex, age, and regions.
Results: Globally, the age-standardized DALY rate for CSA-associated depression in 2021 is 18.08 (95%UI [8.75–30.97]) per 100,000 people, the same as in 1990 level. Females are predominantly afflicted in 2021, with age-standardized DALY rate per 100,000 population of 21.66 (95%UI [10.59–36.50]), 1.5 times higher than that of males. Trends for both genders remained broadly consistent throughout the period. The burden spanned all age groups, rising rapidly in adolescence and adulthood, peaking between ages 40 and 44, and then declining steadily. In the most recent year, the low-SDI group had the highest age-standardized DALY rate at 29.51 (95%UI [14.55–51.39]) per 100,000 population, while, surprisingly, the high-income category displayed the second highest DALY age-standardized rate, which has been rising continuously throughout the past 30 years. Among all super-regions, sub-Saharan Africa had the largest burden, contributing age-standardized DALY rate of 37.08 (95%UI [18.43–62.98]) lost per 100,000 population.
Conclusions: The global burden of CSA-related depression has not decreased since 1990, with middle-aged women in low-income countries being the most affected. Notably, a time-lag effect is observed, with a delay between the onset of CSA and the emergence of MDD. These findings highlight the role of inadequate healthcare in worsening depression. Future research should prioritize optimizing healthcare resource allocation to address this issue.

The global burden of major depressive disorders attributed to intimate partner violence among females between 1990 and 2021: a secondary analysis from the Global Burden of Disease Study 2021

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Background: Intimate partner violence (IPV) significantly contributes to the risk of major depressive disorder, violence, and HIV, posing a serious health threat, especially to women. The direct relationship between IPV and MDD was consistently supported by previous studies.
Objectives: This study aims to delineate global, national, regional, temporal, and age-specific trends in major depressive disorder associated with intimate partner violence among females.
Methods: We utilized data on disability-adjusted life-years (DALYs) from the Global Burden of Disease Study 2021 to analyze major depressive disorder linked to intimate partner violence among females from 1990 to 2021. We performed Joinpoint Regression Analysis to calculate annual rate change.
Results: From 1990 to 2021, the global all-age DALYs attributed to major depressive disorder linked to intimate partner violence in females rose from 1,525.8 thousand (95% UI 4.6–3406.1) to 2,793.2 thousand (95% UI 9.3–6127.7). Age-standardized DALY rates remained fairly stable from 1990 to 2005, and again from 2010 to 2019.). Two notable fluctuations were observed: a significant decrease in DALY rates between 2005 and 2010 (57.5 DALYs [0.2–126.8] per

100,000 people) and a sharp increase from 2019 to 2021 (67.0 DALYs [0.2–146.8] per 100,000 people). In 2021, the highest age-standardized DALY rates occurred in low SDI countries (96.3 DALYs [0.4–212.1] per 100,000 people), while middle SDI countries reported the lowest rates (95.7 DALYs [0.1–114.9] per 100,000 people).). Regional analysis showed that age-standardized DALY rates peaked in Uganda, with many high-rate countries located in Africa.
Conclusions: Intimate partner violence proved to be a significant risk factor for major depressive disorder in low SDI countries and the African region, notably affecting individuals aged 35-49. A sharp increase in age-standardized DALY rate was observed during the COVID outbreak. These findings highlighted the urgent necessity for victim protection, the advancement of gender equality, and targeted interventions for major depressive disorder.

Economic burden attributable to high BMI-caused cancers: a global level analysis between 2002 and 2021

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Background: High BMI shows an established correlation with the risk of cancers, and obesity is a prevailing concern in modern society.
Objectives: This study aims to assess the economic burden of cancers attributable to high BMI.
Methods: This study is based on data from the Global Burden of Disease (GBD) 2021 database. To estimate the economic loss for each cancer in each group, we employed the Value of Statistical Life approach (VSLA), which incorporates a willingness-to-pay metric and estimates the financial loss due to total DALYs. Joinpoint regression analysis was utilized to capture the temporal trends.
Results: On the global level, the DALYs and deaths show an increasing trend from 2002 to 2021, with a slight fluctuation in the age-standardized DALYs rate in 2005. The economic loss from total DALYs increased by 193%. Though females had higher burdens, the gender gap diminished (female/male:1.55 to 1.45). Uterine cancer took the most significant proportion of all the causes of high BMI, and colon and rectum cancer (CRC) show the highest economic loss ($2593.159 million to $7294.52 million), with pancreatic (AAPC: 10.4459) and liver cancer (AAPC: 8.0540) being the fastest growing cause. The cancer burden for all measures positively correlates with the country's income level. The gender gap shrank in three income tiers but witnessed a minor growth in low-income countries. CRC contributed the most to the loss in all the tiers.
Conclusions: The disease burden of HBCCs is concerning and positively correlated with income level. Economic loss and epidemiologic burden are similar in growth patterns but sometimes differ as the monetary value of working age varies in different income tiers. Females have higher burdens due to the types of cancers they suffer, and certain types of cancers contribute much more to the economic loss. These findings necessitate further investigation of government subsidy policies and international agencies.

Revealing positive perceptions and accessibility challenges in virtual reality rehabilitation for stroke patients and caregivers in Indonesia: a qualitative study

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Background: Stroke is a major global health issue, often resulting in disability and affecting daily functioning. This highlights the urgent need for effective, patient-centered rehabilitation strategies. Virtual reality (VR) is a promising approach for stroke rehabilitation, which is potential in improving patient adherence and assertiveness. However, limited studies have explored patients' perceptions of VR, which are crucial factors in the rehabilitation process. Investigating these views is vital to enhance VR and ensure a patient-centered approach to rehabilitation.
Objectives: This study aims to explore stroke patients' perceptions of virtual reality implementation, including the benefit and the difficulties, also the potential for further development of VR in rehabilitation, particularly in Indonesia.
Methods: This is a qualitative descriptive study, utilizing interviews with patients undergoing rehabilitation at Universitas Indonesia's Hospital (RSUI) and their caregivers. Patients experienced a VR game specifically designed for rehabilitation, followed by interviews with a semi-structured approach. All data were audio-recorded and transcribed verbatim. Thematic analysis was done using Step Coding and Theorization (SCAT).
Results: A total of 10 stroke patients and 4 caregivers participated in the study. The majority of the patients reported positive feelings toward VR rehabilitation. Despite facing some challenges in adjusting the headset and

pressing buttons, participants generally found VR convenient. They believe that VR is beneficial for hands' motoric training, memory training, and emotional support in stroke rehabilitation. The patients prefer traditional therapies over VR, but they see value in combining the VR for maximum benefit if it's freely available in the hospital. However, the high cost of purchasing VR alone is still a barrier. Suggestions include adding sensitivity options to controllers and expanding selection of the games to involve comprehensive body movements.
Conclusions: Stroke patients generally have positive perceptions of VR rehabilitation and recognize its benefits. However, the high cost of VR equipment remains a significant obstacle to accessibility.

Effects of increasing estrogen: androgen ratio on mouse primary prostate cells

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Background: Sex-steroids (DHT and estradiol) have an important role in the maintenance of normal health of the prostate. The profile of these hormones in males alter with advancing age, suggesting certain correlation between these alterations and prostate pathologies, due do altered stromal-epithelial interactions in the gland. As stromal-epithelial co-culture is an effective representation of in vivo conditions in the organ, we hypothesize that primary stromal and epithelial cells derived from the mouse prostate can be utilized to study this altered crosstalk in a co-culture setup when subjected to various concentrations of estrogen (E2) and DHT.
Objectives: The study aimed to investigate the effects of increasing ratio of estrogen: androgen on proliferation of primary mouse prostate cells *in vitro* in a co-culture setup.
Methods: C57BL/6 male mice were euthanized and their urogenital system was dissected en bloc. Prostate lobes were processed to obtain a single cell suspension. The stromal and epithelial cells were separated using percoll gradient and characterized by immunostaining. Stromal cells were cultured under increasing E2 at different fixed concentrations of DHT to optimize the dose of hormones. Further, the cells were co-cultured and proliferation was checked using Calcein AM staining. Results were obtained from 3 independent experiments. Data were analyzed using GraphPad Prism 8.01 with one way ANOVA and Student's *t*-test (significance set at $P < 0.05$).
Results: The primary stromal and epithelial cells were successfully isolated and characterized. Treatment with increasing E2: DHT ratios induced significant proliferation in both the cell types in co-culture, at 2:1 (20 pM E2 and 10 nM DHT) ratio thus highlighting the influence of sex steroids on cell interactions and proliferation.
Conclusions: Our findings indicate that ageing associated hormonal alterations significantly alter the prostate cell physiology, which could lead to the initiation of BPH and prostate cancer. Further studies are required to investigate underlying mechanisms.

Association of accessibility to basic health and social services and stunting among children 0-59 months in Butuan city, Agusan del Norte

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Background: Stunting is a persistent problem in the Philippines, with different rates between urban and rural areas. Childhood stunting was reported in Butuan City, Agusan del Norte, but it had not been desegregated into urban and rural barangays. Additionally, potentially associated factors had not been studied in the area.
Objectives: The study generally aims to determine the relationship of accessibility to basic health and social services and stunting rates of children 0-59 months in urban and rural barangays in Butuan City, Agusan del Norte.
Methods: The study used dataset on child nutritional status from the local government, geographic information systems (GIS) tools, and statistical analyses to determine the stunting rate of children 0-59 months and its association with accessibility to basic health, food, water, and social services.
Results: Stunting rate in urban barangays was lower (0.688% ± 1.61) than in rural barangays was (1.990% ± 3.39). Urban barangay populations were closer to basic health services (mean distance; 1.27 km versus 10.3 km), social services (mean distance urban: rural; 2.89 km:7.86 km), public markets (mean distance urban: rural; 1.12 km: 8.37 km) and had better residential water coverage (mean coverage urban: rural; 80.53%:47.78%) compared to rural barangay populations. Conversely, accessibility to health and social services, public markets, and water coverage was better in urban barangays than in rural barangays. There was a negative association between the residential water coverage and stunting ($r = -0.335$; $P < 0.002$), while other tested factors did not show association with stunting rates.
Conclusions: The study findings show rural barangays are disadvantaged when it comes to accessibility to basic services when compared to urban barangay populations. Additionally, further research is needed to identify and test more factors associated with stunting in the sample area to better understand the interplay of potentially associated factors.

Artificial intelligence (AI) adoption in healthcare sector in Singapore

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Background: The rapid development of AI has created opportunities for enhancing healthcare systems worldwide. Although there are numerous benefits of AI, the healthcare sector faces several barriers in AI adoption. Understanding these barriers and the impact of AI adoption on healthcare services is essential for integrating AI into the healthcare systems. Thus, this study aims to explore the current state of AI adoption in Singapore's healthcare sector, identify key drivers and barriers to AI adoption and their impact on the healthcare sector, and make policy recommendations to address such barriers.

Description: This study employs a comprehensive analysis of existing literature, policy frameworks, and conducts case studies from Singapore's leading healthcare institutions, namely Changi General Hospital and Tan Tock Seng Hospital. In the context of Singapore, case studies from leading healthcare institutions can offer practical examples of successes and challenges.

Lessons Learned: The preliminary findings reveal that several initiatives (e.g., the Digital Health Masterplan, the National Electronic Health Record system) has produced an integrated digital health ecosystem in Singapore. Artificial Intelligence Predictive Engine and other AI apps can predict the likelihood of patients requiring critical care promptly, monitor vital signs during virtual consultations, assist doctors in diagnosing/recommending treatments, and triage patients in emergency departments more efficiently. Key drivers of AI adoption include government support, policy frameworks, technological infrastructure, healthcare needs and demographics. Barriers to AI adoption include data availability, data privacy and security, high implementation costs, and resistance to change.

Next Steps: Enhancing data security, providing financial support, fostering education/training, ensuring system integration, and addressing ethical concerns could help the healthcare sector effectively harness the potential of AI to improve operational efficiency. Overall, this study provides insights into good practices and strategic recommendations for leveraging AI to address healthcare challenges. The lessons learnt from Singapore can contribute to further research on AI and digital health transformation.

Development and automation of 'Easy Language' for healthcare in Thailand

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Background: Inclusive communication plays a crucial role in providing accessible public services, especially healthcare for individuals with special needs, such as those with mental disabilities that affect reading and language processing abilities. 'Easy Language' is a simplified form of standard languages designed to facilitate comprehension for these target groups (Lindholm & Vanhatalo, 2021). While language simplification guidelines and practices are common in western languages, e.g., 'Easy Read' in English (Chinn & Buell, 2021), 'Leichte Sprache' in German (Maaß et. al, 2021), and 'Taal voor allemaal' in Dutch (Moonen, 2021), there is a lack of research and advocacy for this practice in Thai.

Description: This initiative aims to develop practical guidelines for creating texts in the Easy Language variation of Thai as part of the cognitive healthcare system. We have created a pilot guideline and conducted an experiment on processing Thai classifiers to better support the aspect in the guideline. Additionally, it seeks to use artificial intelligence (AI) to automate the translation of standard Thai into Easy Language.

Lessons Learned: The initial development of pilot guidelines involved reviewing and adapting Easy Language guidelines from English, German, and Dutch. However, implementing Easy Language in Thailand poses quite a few challenges. These challenges include understanding the complexity of Thai in aspects that are different from Indo-European languages and evaluating the country's language policies regarding inclusive communication.

Next Steps: The project plans three main actions: 1) conduct experiments with Easy Language pilot guidelines to test their effectiveness with clinical target groups, 2) explore automation possibilities, such as using pretrained language model (LM) and computer-assisted translation (CAT), drawing inspiration from German initiatives (Hansen-Schirra et al., 2020; Spring et al., 2021), and 3) review and analyze language planning and policy (LPP) to recommend strategies for promoting simplified language for inclusive communication in Thailand.

Initial steps in designing a care companion robot to mitigate agitation using empathic patient- robot interactions

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Background: In the US, an estimated 6.7M currently have dementia; a number expected to increase to 13.8M by 2060. Among persons with dementia (PWD), agitation and fall risk is common, with the onset of agitation often unpredictable. PWD are 4-5 times more likely to fall than older people. Onboard sensing technologies, including cameras and motion sensors can sense the state of the PWD, and support verbal and non-verbal communication with the person. Currently, existing social robots lack the emotional intelligence to respond to the person-specific emotional state through an empathic communication. We plan to design and validate a foundational model of emotional intelligence for empathic person-robot interaction that mitigates agitation in PWD using a Care Companion Robot (CCR).
Description: We plan to: 1. Use computational AI/ML methods to first collect non-invasive data, and develop models to forecast emotional status, agitation level and gait in real-time. 2. Evaluate the empathy- focused conversation model for the CCR in the community, using quasi-experimental and mixed method approaches.
Lessons Learned: To date, we have learned about the importance of community input. A Community Advisory Board (CAB) was formed to discuss the logistics of the study and relevancy of empathy focused conversational models delivered by the CCR. The setting is Amore Senior Living Facilities located in California; care for 6 PWD per facility. Further, we are learning from the following activities being undertaken: 2) using technology to collect Personal Chronological Data (Personicle) and Personal Stories for which we are developing Personas and Storyboards; 3) develop statistical models to understand and forecast a PWDs' emotional state, agitation level and gait in real-time ; and 4) design and evaluate an empathy-focused model that considers a PWD's emotional state.
Next Steps: This University of California funded Noyce grant team is actively pursuing the aims of the study with multidisciplinary sub-teams of faculty and students.

Accuracy of auto transcription of in-depth interview among healthcare representatives from Thailand 2024

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Background: ChatGPT has taken the world by storm through its human-like conversation and enormous knowledge from a large language model (LLM). Apart from the ChatGPT, there is a less well-known AI model named Whisper, which was pre-trained by 680,000 hours of multi-language speech on the Internet. Whisper can be applied for automatic speech recognition (ASR) and has been shown to outperform existing ASR systems.
Description: In this research, we applied Whisper API to transcribe the English interviews given by Thai emergency medical services decision makers in Thailand under the theme of healthcare system strengthening. Three distinct aspects warrant our investigation. First, Thai language is considered a low-resource language for the AI model. So, any Thai words such as names could have more transcription errors. Second, the interviews were conducted in English but English is not a native language for Thai. So, speech error itself may result in transcription difficulty. Third, the context is about healthcare policies which is in a quite specific domain. There might be some specific words or technical terms that are less common. All these aspects may have some influence on the transcribing performance of Whisper.
Lessons Learned: Therefore, the performance of Whisper transcription was verified by six real-life interviews, taking about 4 hours and 45 minutes in total. The transcription results in more than 45 pages of text. We classified the errors into four categories: misread words, omitted words, added words, and spelling error words. According to the results, we found that the overall transcription error of Whisper is only about 1.6 percent. This has shown that Whisper could efficiently transcribe the interviews and save time for the interviewer.
Next Steps: As interviewing is a common task, we advocate the application of Whisper in further taking an important role in transcribing the interviews to help the researchers conduct research more efficiently.

The association of mobility, social support, and social participation among the community-dwelling elderly in a Chinese society in the digital era

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Background: Social participation plays a crucial role in maintaining the wellbeing of the elderly population. In the telecommunication era, the advancement of Information and communication technology could lead to changes in social participation in the aged population. Mobility level and social support could be potential contributing factors to the extent of social participation.
Objectives: This study aims to examine the association between mobility and different types of social participation among the elderly in Chinese society in the 21st century and to investigate whether social support modifies the effect of the association.
Methods: Two hundred and sixty-two elderly people aged more than 65 years and living in the community were recruited in this cross-sectional study and completed a self-administered questionnaire from November 2023 to February 2024. The mobility characteristics were collected

by validated Life-Space Assessment while social support was assessed with the validated Lubben Social Network Scale. Social participation was examined using the reported frequency of social activities. Multiple linear regression analysis was applied to analyze the association and the moderating role of social support.

Results: Digital participation was the most prevalent type of social participation in the community-dwelling elderly in Hong Kong. Mobility had a significant positive association with involvement in all types of social participation (formal participation: $r = 0.009$, $P = <0.001$; informal participation: $r = 0.007$, $P = <0.001$; digital participation: $r = 0.019$, $P = <0.001$). The mediating role of social support solely existed in the association between mobility and informal participation with statistical significance ($r = 0.001$, $P = 0.017$.

Conclusions: With comprehending the needs and disablement of the elderly population in the community, specific strategies should be adopted to promote social participation and digital inclusion in order to build an age-friendly city in the digital era. This study also acknowledges the importance of reviewing current practices of promotion of digitalization in the elderly population.

Evaluating AI voice preferences in adolescent health modules: trust and preference dynamics among teens and guardians

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Background: The growing use of artificial intelligence (AI) tools, including AI voices, in health information dissemination is designed to bridge communication gaps in healthcare. Aligning these AI features with the needs of teens and their guardians is essential for improving health literacy and decision- making capabilities.

Objectives: This study investigates how AI voices in health learning modules can enhance annual well-child visits by identifying teens' and their guardians' preferred voice characteristics and factors influencing perceived trustworthiness.

Methods: In a cross-sectional study in Northern California, preferences and trust perceptions of AI voices were evaluated by teens (11-18) and their parents/guardians using eight AI voices across four adolescent health-related learning modules, including general communication, sexual and reproductive health communication, parental monitoring, and well-child check-ups. Participants rated voice characteristics like intelligibility, naturalness, prosody, social impression, trustworthiness, and overall appeal on a 1-10 Likert scale and chose their preferred voice for each module. Descriptive statistics, chi-square/ *t*-tests, and regression models were used to analyze demographics, voice preferences, and factors influencing the trustworthiness of the top-selected voices.

Results: Data analysis from 104 participants (63 teens, average age 14.9, 54% male; 41 adult guardians, average age 41.9, 12% male) revealed similar voice quality ratings across teens and guardian groups, but preferences varied by module topic. Teens preferred younger female voices for general communication, whereas guardians favored mature female tones; both groups agreed on mature female voices for sexual and reproductive health topics. Social impression and sound appeal were the key factors, accounting for 71-75% of the variance in trustworthiness ratings.

Conclusions: These findings emphasize the importance of customizing AI voices according to the listener's age and the specific health information being communicated. Aligning AI voices with user preferences can enhance engagement, trust, health literacy, and decision-making in teens and their guardians.

Effectiveness of palliative and hospice care basic training manual on non-health and health practitioners' level of knowledge in the Philippines: a preliminary study

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Background: Palliative and hospice care in the Philippines has received increased attention recently, notably with the introduction of Republic Act 11223 or the Universal Health Care (UHC) Law in 2019. In preparation for UHC's full implementation, healthcare workers must have the necessary skills, knowledge, and attitude to provide high-quality palliative and hospice care and integrate into local health systems to promote a multidisciplinary and interdisciplinary care approach.

Objectives: This study aims to assess the effectiveness of the Basic Palliative and Hospice Care Training Manual in improving the participant's knowledge.

Methods: The Basic Palliative and Hospice Training Manual was developed from May to November 2020 through training needs assessment, technical write-shops, and stakeholder consultations. Due to the **pandemic,** blended learning design was utilized on its implementation last 23-27 November 2020, with 36 contact hours. The training was attended by participants from both health

and non-health sectors (N = 106). A 50-item questionnaire was given pre- and post-training. Pretest scores and posttest scores were analyzed using Paired *t*-test to assess the effectiveness of the training.
Results: Only 80 out of 106 (75.47%) participants completed the pretest and posttest with t(79)= -13.771, $P < 0.0005$. In comparing the means of participants' test results and direction of t-value, it can therefore conclude that there was a statistically significant improvement in participants' test results following the conduct of basic palliative care training program, from 34.06 + 5.56 correct items to 43.03 + 5.03 correct items ($P < 0.0005$); an improvement of 8.96 + 5.82.
Conclusions: The Basic Palliative and Hospice Training Manual effectively increases and improves the participant's knowledge of palliative and hospice care. Continuous course appraisal and evaluation are still needed to ensure its congruence with the current standards and evidence-based practice. With the results, conducting training in both public and private institutions is imperative.

Impact of the social determinants of health in patient outcomes in a medical mobile clinic in the Philippines
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Background: Disparities in healthcare access exist in the Philippines and ABC's for Global Health (ABCGH) has established a medical mobile clinic (MMC) providing primary care services to geographically isolated and disadvantaged areas (GIDA) in the province of Pampanga. The MMC had evaluated non- medical factors or the social determinant of health (SDOH) that may contribute to the health outcomes of the patients.
Objectives: The study aims to determine the impact of the SDOH on the health outcomes of the patients of the MMC
Methods: The MMC provides its primary care services to 15 communities in Pampanga and it is open to all patients but with emphasis for non-communicable diseases such as hypertension, diabetes, and their complications. There was a total of 487 participants included in this study: are comprised of adult patients with or without disease, and were initially evaluated using the Short Form 36 (SF-36) survey to determine health outcomes in terms of physical and mental health based on 8 categories. Regression and Chi- Square analysis with confidence level of 95% was done.
Results: The SF-36 health outcomes were into Physical and Mental Health and further divided into 4 categories each: Physical Health – Physical Functioning, Role Limitation due to Physical Health, Bodily Pains, and General Health; Mental Health – Role Limitation due to Emotional Health, Vitality, Emotional Well Being and Social Functioning. It has been shown that age, presence of comorbidities, living conditions, employment status, social class and access to government services such as school, healthcare, security, roads/transportation and sanitation have an impact on the 8 categories of physical and mental health outcomes of the patients.
Conclusions: There are implications that the various SDOH have an impact on the health outcomes of patients of the MMC and does not solely rely on the access to healthcare.

Empowering high school students with AI: a practical course on healthcare innovations using image processing
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Background: The rapid advancement of artificial intelligence (AI) in healthcare presents both opportunities and challenges. To leverage these technologies for healthcare innovations, it is crucial to equip the next generation with the necessary skills. However, high school students often lack exposure to AI and its applications due to a scarcity of practical learning modules.
Description: To address this gap, we developed an 8-session learning module designed to introduce high school students to AI applications in healthcare, with a particular focus on image processing—a technological innovation that improves diagnostics, treatment, and patient outcomes. The course is structured into two phases: foundational skill development and small group projects. In the first phase, students with no prior coding experience engage in hands-on tasks to acquire essential Python coding skills. They learn machine learning, deep learning, and image processing basics, progressing from fundamental concepts to advanced topics using libraries like OpenCV. All image examples are healthcare-related, including X-rays, ultrasound, mammograms, dermatological images, and retinal imaging. In the second phase, students work in small groups to develop healthcare innovations, culminating in project proposals and pitching sessions. Acting as healthcare innovation developers, they present prototypes to professionals and funders, using design thinking to define research questions and apply image processing techniques.
Lessons Learned: Preliminary results from a cohort of 16 students demonstrated significant positive outcomes. Students showed increased enthusiasm for AI and coding, with many expressing interest in further studies in these fields. Their understanding of image processing in healthcare contexts improved markedly. The final pitching sessions revealed the students' capacity to collaboratively

and effectively present their innovative solutions.
Next Steps: Next, we plan to refine and expand the course by including more students with diverse technological backgrounds and incorporating varied healthcare case studies. These steps will enhance the course's impact, preparing more students to address real-world healthcare challenges using AI technology.

Ethical considerations in global health research: informed consent and cultural sensitivity
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Background: Global health research in culturally diverse settings presents ethical challenges, particularly in obtaining informed consent and ensuring cultural sensitivity. This project examined these issues through case studies of HIV prevention research in Uganda and malaria vaccine trials in Ghana.
Description: In Uganda, researchers faced difficulties due to low literacy levels and misconceptions, addressed by using visual aids and community health workers for consent processes. In Ghana, researchers needed to respect local customs and beliefs to build trust, achieved through extensive community engagement and involving community leaders.
Lessons Learned: Key insights include the necessity of adapting consent processes to local contexts, engaging community leaders early, and respecting local customs to enhance cultural sensitivity. The importance of community advisory boards and local ethical review processes was also highlighted to align research with cultural norms and address ethical issues.
Next Steps: Future actions involve developing guidelines for informed consent and cultural sensitivity in global health research, creating training programs for research teams, and strengthening collaborations with local communities and ethical review boards. These steps aim to protect participants' rights and improve the validity and reliability of research findings in diverse cultural settings. By addressing these challenges, researchers can ensure ethical research practices, protect participants' rights, and contribute to global health improvements in an ethical and respectful manner.

Decolonizing global health through introducing global health to undergraduate medical students in middle-income country context
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Background: Initiated by 'Western, high-income countries,' global health aimed to promote public health in lower- and middle-income countries (LMIC) through donor-recipient relationships. Decolonizing global health requires medical community's global involvement. In Thailand, medical education spans a six- year curriculum, with some integrating health systems science. However, the notable absence of global health education in Thai undergraduate medical programs calls for improvement.
Objectives: This study evaluates global health comprehension in medical students participating in pre-global health modules and the Prince Mahidol Award Conference (PMAC), an international conference on global health, as rapporteurs.
Methods: Sessions on Introduction to Global Health, Global Health Governance, Commercial Determinants of Health, and Decolonizing Global Health were organized didactically in a hybrid mode by partnering with the International Health Policy Program (IHPP). Discussions on assigned academic articles were arranged to equip medical students with background knowledge of global health. Students were selected to be rapporteurs at the PMAC objectively to enhance their learning experience. Students participated voluntarily, and open-ended reflections were encouraged before and after the program. The characteristics of enrolled students were collected and analyzed by descriptive statistics. The responses of open-ended reflections were analyzed by thematic content analysis technique.
Results: Twenty preclinical and clinical medical students, participated, with 17 of them lacking prior exposure to global health have seen its importance to obtain health for all, and eager to explore global health further by being aware of current issues. After the PMAC, additional elements of global health knowledge were acquired. The five common themes—Local and global knowledge exchange, Youth advocacy, Decolonization of Technology, Global Health Education, and Career aspirations—were analyzed through thematic analysis.
Conclusions: Participating in this global health educational program has deepened students' understanding of global health and the youth's role in decolonization efforts. Therefore, medical schools should introduce global health to encourage medical community's broader engagement.

Analysis of public health risks that living near of Cipayung Landfill Waste, Depok City, West Java Province in 2023
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Background: The impact of the existence of a Final Processing Site (TPA) in the presence of pollutants may

occur in the form of air pollution due to waste decomposition. Apart from that, water and soil can also be contaminated due to leachate seepage from waste piles. Physical and chemical environmental conditions can become inconsistent with normal conditions as a result of the pile of waste.
Objectives: This research aims to conduct a public health risk analysis in the area around Bulak Barat, Cipayung Village, Depok City which is close to the Cipayung TPA with a focus on the environmental impact on public health.
Methods: The methods used include hazard identification, dose response analysis, exposure analysis, and risk characterization analysis also using Imfinger and Impaction also many labour tools. Non- carcinogenic risk characterization is expressed in Risk Quotient (RQ) values and the results of microorganism infection risk characterization are expressed in Excess Infection Risk (EIR) values by sampling river water, ground water, ambient air, food, and anthropometric parameters with questionnaires for eight local residents from three houses as samples.
Results: The research results show that there are physical, chemical, and biological exposures that can have a negative impact on public health in the area for all age groups, especially Nitrite exposure (RQ > 1), where the highest risk is in children aged 6-12 years (RQ = 3.71). E.coli bacteria in well water (E+1 to E+2) in all groups exceeding the consensus acceptable risk limit (E-4), exposure to H2S gas in the air with real time RQ>1.
Conclusions: The implication of the results of this public health risk analysis is the need for appropriate preventive and intervention measures to reduce the negative impact of this exposure, we need a good technology for managing this waste, so hoping this result can be references for government and stakeholder to take an appropriate action.

Molecular identification and probiotic potential of a plant-derived lactic acid bacterium isolated from *Musa acuminata* x *balbisiana* in florescence

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Background: The need for plant probiotic strains is driven by concerns on lactose intolerance and dairy allergies. This has led to investigating plant-derived lactic acid bacteria (LAB) as a promising alternative to address health and dietary issues.
Objectives: The present investigation offers an avenue to explore the diversity, probiotic potential and functional attributes associated with floral sources, identifying potential probiotic strains with unique health- promoting properties.
Methods: The isolated LAB strain, designated as BNA1, exhibited typical LAB morphology, including gram- positive staining, catalase negativity, and coccobacilli morphology. BNA1 was subjected to API 50CHL for carbohydrate fermentation profiling, followed by identification via 16S rRNA gene sequencing, and assessment of probiotic properties using resistance, safety, and functionality assays. Statistical analysis was performed using two-way ANOVA with a significance level of $P < 0.05$, followed by Bonferroni's post hoc test. All experiments were conducted in triplicate, and the results were reported with means ± standard deviation.
Results: Results indicated robust fermentation activity of BNA1 on 27 carbohydrates, with weaker activity observed on 14 others. Phylogenetic analysis based on the 16S rRNA gene classified BNA1 as a member of the Lactiplantibacillus genus. Furthermore, BNA1 exhibited desirable probiotic traits, including growth across a temperature range of 4°C to 45°C, tolerance to NaCl stress (2.5%-5%), high survivability under gastrointestinal conditions, hydrophobicity towards xylene, strong auto aggregation, co-aggregation with select pathogens, robust biofilm formation, and production of exopolysaccharides from various carbon sources. In addition, BNA1 exhibited antimicrobial activity against *Escherichia coli*, *Staphylococcus aureus*, *Bacillus subtilis*, and *Enterococcus faecalis*. Nevertheless, BNA1 exhibited resistance to antibiotics including ciprofloxacin, ampicillin, ceftriaxone, kanamycin, and streptomycin.
Conclusions: The ability of BNA1 to withstand the harsh gastrointestinal environment, facilitate efficient host colonization, and exhibit antimicrobial activity against pathogenic bacteria suggests its potential as a probiotic strain for gut health and infection control.

Scaling-up of evidence-based practices for management of child-drowning: an imitable collaborative model in Bangladesh

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Background: Drowning has been identified as one of the leading causes of preventable deaths worldwide. In Bangladesh, about 9% of under-five mortality is due to drowning and poses as leading cause of death (43%) among 1-4-year-old children.
Description: Drowning has been identified as one of the leading causes of preventable deaths worldwide. In Bangladesh, about 9% of under-five mortality is due to drowning and poses as leading cause of death (43%) among 1-4-year-old children.
Lessons Learned: Joint collaborative effort, advocacy and

networking has emerged as a powerful tool to shape better policy and shift entrenched attitudes and practices. Committing to such evidence-based programs can help the government to strengthen efficiency and accountability on improving outcomes for children and their families in child-survival, rights and childhood-development.
Next Steps: The collaborative advocacy initiated a vast opportunity to improve child healthcare, needs to be continued and a strong commitment of the government to injury research in Bangladesh. It also safeguards quality assurance to ensure that evidence-based practices are replicated with fidelity, conducts data-driven reviews to improve program performance at field level and guides the government on policy and practice decisions over time.

"I'm always gonna be fish out of water" – a qualitative exploration of Philippine-educated nurses transitioning experiences in Ontario, Canada

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Background: Filipinos are amongst the fastest growing visible minority groups in Canada (Laquian & Ma, 2021). Despite the huge number of highly-educated professionals from the Philippines in general, and the great number of Philippine-educated nurses (PENs) working within Canada's healthcare system, we are not aware of any literature that specifically explored PENs' experiences with workplace transitions or their employment trajectory in Canada and how these have impacted their labour outcomes.
Objectives: Using PENs as our case study, our objective is to explore the employment trajectory of these IENs within Ontario's labour landscape.
Methods: Following receipt of research ethics clearance from the University of Windsor, we conducted in-depth interviews with PENs. All interviews were audio-recorded and transcribed verbatim. Data was managed using ATLAS.ti 23, and analyzed using Braun and Clarke's (2019) framework for thematic analysis.
Results: Four themes were identified from the interviews: 1) adversity and workplace challenges; 2) preparing for work and bridging education; 3) microaggression, stereotyping, discrimination, racism; and, 4) planning for the future.
Conclusions: PENs in this study encountered challenges starting their nursing career in Canada. With the ongoing global nursing shortage and the competition amongst high-income countries to recruit internationally educated nurses, there is an urgent need for governments and employers to provide sufficient and appropriate supports to this group of nurses to promote their retention in the workplace and to avoid brain waste.

Resilience capacity of emergency medical service (EMS) provides in Thailand regarding and re-emerging infectious diseases

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Background: EMS providers serve on the front lines of emergency medical care, which is one of the integral components in an EMS system of a country. Since the latest pandemic has caused increased burn out and stress among the service providers with long term mental and physical effect which is yet to be researched in Thailand, and less studies in particular have addressed to evaluate the resilience capacities of the front-line EMS providers.
Objectives: This study aims to measure the resilience capacity of EMS providers of Thailand along with providing recommendations to decision makers for EMS workforce planning and development.
Methods: This study is a cross-sectional on-line survey conducted in 32 provinces of Thailand with 500 registered EMS providers. The study population included ambulance team-paramedics, emergency nurse practitioners and emergency medical technicians. Structured and validated questionnaires were designed by researchers with total 61 items. Conformity and Content-Based Accuracy of Research Questions (IOC) and reliability test was conducted before the start of the data collection.
Results: The result from the survey shows that the EMS providers have moderate resilience capacity in the dimensions of behavioral health, safety climate, wellness, and competencies. Descriptive and bivariate analysis was conducted followed by factor analysis process for the resilience measurement scale with both the Exploratory and Confirmatory Factor Analysis (EFA/CFA) using SPSS, AMOS. After the final model of CFA was finalized, resilience measurement components for Thai EMS providers were redefined and finalized. In addition, thematic analysis was conducted using NVivo-14, for the open-ended questions from the survey.
Conclusions: The findings provide crucial recommendations to decision makers for developing resilient EMS workforce focusing on pre-hospital care setting and enhancing their resiliency to prepare to tackle future emerging and reemerging diseases situation in Thailand. Keywords: emergency medical services; EMS; pre-hospital care; EMS workforce; personal resilience; psychological resilience

Pharmaceutical Care Challenges for Bangkok's Homeless: Insights from Pharmacy Students

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Background: After two decades of establishing a universal coverage health in Thailand, some marginalized groups still face barriers to accessing essential health services. Homeless individuals constitute one such group. In 2023, there were approximately 2,499 homeless people in Thailand, with 1,217 located in Bangkok, the capital province. A group of pharmaceutical science students volunteers in the series of mobile health services for the homeless in central Bangkok during 2023-2024, focusing on providing pharmaceutical care to these individuals. Observations of drug-related problems were made.
Description: An inability to comply with medication regimens in cases of chronic diseases was observed among the homeless population, caused by a lack of access to primary care due to unaffordable transportation and insufficient information about public health insurance benefits. Furthermore, issues such as malnutrition and food insecurity prevent homeless patients from taking certain medications, particularly those for diabetes and gastrointestinal irritation. Proper drug storage, for example for eyedrops, is not feasible for the homeless due to a lack of secure living spaces and refrigeration. These challenges may be attributed to the policies effort to ensure direct healthcare expenditure coverage without taking into account other determinants of health.
Lessons Learned: The students' insights highlight the perspectives of young professionals and call for global and national-level action to address the challenges faced by the minority group of homeless people, whose struggles persist despite many successes in achieving universal health coverage. Beyond financial protection to reduce barriers to accessing health facilities, sustainable and effective solutions to health concerns specific to the homeless population are lacking, with only sporadic charitable campaigns in place.
Next Steps: This issue of homelessness is present across many countries and could potentially be a starting point for global health studies for all students. The authors advocate for embedding this topic into the curriculum to promote more equitable health systems worldwide.

Community-based strategies initial steps in designing a care companion robot to mitigate agitation using empathy for maternal and child health surveillance in Depok City: analyzing the collaborative governance framework

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Background: Maternal and child health (MCH) surveillance is essential for identifying health trends, informing policy decisions, and improving health outcomes. This study uses a collaborative governance framework to explore community-based strategies for MCH surveillance in Depok City.
Objectives: The research aims to analyze the effectiveness of collaborative governance in enhancing MCH surveillance by integrating diverse stakeholders' roles.
Methods: This study employs a qualitative approach, incorporating in-depth interviews, focus group discussions, and document analysis. The research framework is based on the penta-helix model, which involves the roles of academic institutions, businesses, communities, government bodies, and media (ABCGM). Data collection focuses on understanding how each stakeholder contributes to MCH surveillance, their interactions, and their collaboration's overall impact on health outcomes.
Results: Preliminary findings suggest that the collaborative governance framework facilitates improved data collection, timely reporting, and enhanced community engagement in MCH surveillance. Each stakeholder group plays a crucial role: academic institutions provide research and training, businesses offer resources and logistical support, communities contribute local knowledge and participation, government bodies ensure policy alignment and funding, and media promote awareness and information dissemination.
Conclusions: The penta-helix approach to community-based MCH surveillance in Depok City demonstrates the potential for collaborative governance to create more robust and responsive health surveillance systems. By leveraging the strengths of various stakeholders, this model can be a blueprint for other regions aiming to enhance their MCH surveillance and improve health outcomes. Further research is needed to refine the framework and evaluate its long-term sustainability and scalability.

Two transitions, one approach: digitally enabled, climate-resilient and sustainable healthcare

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Background: Two major transitions are currently underway

in global healthcare systems - digitization and decarbonization. Despite similar goals for improved efficiency, effectiveness and quality, these transitions are largely occurring in parallel. There are missed opportunities for integrating approaches and hence realizing the full range of benefits for health, economic and sustainability outcomes.

Objectives: To examine similarities, differences and opportunities for synergy and mutual learning between the Digital Health and Sustainable Healthcare transition movements in global healthcare systems.

Methods: This research is led by an inter-disciplinary team from The University of Melbourne, Australia. The project draws on a) findings from expert consultations with digital health, data scientists, healthcare leaders and clinicians, industry representatives, consumers and climate change researchers in 2023 and b) two rapid scoping reviews focusing on i/ sustainable healthcare leadership and governance and ii/ digital health innovation leadership and governance. The data was combined and analyzed by experts from the inter-disciplinary team to form a thought-leadership article.

Results: We outline what we consider to be the 'pressing issues' facing global health systems in the 21st century - digitization and decarbonization; consider the extent to which health services leaders and stakeholders have engaged with and addressed these challenges; compare Digital Health and Sustainable Healthcare approaches to transition; and suggest possibilities for moving forward through joined-up action in one case study country healthcare context, i.e., Australia.

Conclusions: Via our roadmap we demonstrate: identifiable tipping points in innovation and systems change; common goal strategies for quality, safety, cost, efficiencies, patient satisfaction, high quality care and staff satisfaction; benefits of breaking down silos and working across disciplines; and systems level interventions including micro-level (clinical champions, staff education), meso-level (leadership roles and governance structures at organization level) and macro scales (government policy, industry standards and supply chain management, built environment upgrades).

Effective coverage of births in health facilities in Nepal: cross-sectional study combining demographic and health survey 2022 and health facility survey 2021

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Background: In Nepal, despite increasing percentage of births in health facilities, maternal mortality remains a concern. While accessibility of healthcare services is crucial, there is also a pressing need to improve enabling environments to ensure quality of childbirth care.

Objectives: This study aimed to estimate effective coverage of facility-based childbirth in enabling environments in Nepal.

Methods: We used data from Nepal's Demographic and Health Survey (DHS) 2022 including 1,977 women with a birth in the preceding two years and the 2021 Health Facility Survey (HFS) which sampled 804 health facilities offering childbirth services. We performed descriptive statistics to calculate the percentages of births (DHS data) and the percentage of facility types with an enabling environment for childbirth services (HFS data). We performed a weighted analysis of both DHS and the HFS, adjusted for the complex survey design. To combine the DHS and HFS datasets, we harmonized the response options of facility type (place of childbirth) and health providers (person assisting with childbirth). We multiplied the results of the DHS and HFS data to estimate the effective coverage of births in an enabling environment for routine childbirths, basic emergency obstetric and newborn care (BEmONC) and comprehensive emergency obstetric and newborn care (CEmONC) in Nepal.

Results: Around 80 % of all births occurred in health facilities nationwide. This reduced to 18.5% nationwide when only births in facilities equipped for routine childbirth were considered, and further to 12.9% and 12.2%, respectively for BEmONC and CEmONC. The reduction between crude and effective coverage across facility types varied from 36.8% to 13.5% in government hospitals for routine childbirth, to less than 9% for BEmONC and CEmONC, and from 16.1% to 4.7% in private hospitals for routine childbirth, to less than 4% for BEmONC and CEmONC. While, 20.1% of births were in health posts, no health posts had enabling environments.

Conclusions: Fewer than one in five births occur in health facilities with enabling environments for acceptable quality care in Nepal. This emphasises the need for policymakers to prioritise the quality of childbirth services in well-equipped and well-staffed facility environments to improve maternal and neonatal outcomes.

Understanding stigma as a barrier to cancer prevention and treatment in Uganda and Zambia

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Background: While 'AIDS-defining malignancies' have traditionally characterized cancer diagnoses among people living with HIV (PLWH) in Africa, extended life expectancy due to successful ARV treatment has substantially increased the diagnosis of non-AIDS-defining cancers (NADCs). Despite documented impacts of stigma on cancer

preventive behaviors and care, little is known about the intersections of cancer and HIV stigma and how this intersection impacts prevention and care-seeking behaviors for both conditions.

Objectives: This mixed methods study examines the prevalence of cancer stigma and its association with access to, and utilization of, cancer prevention services among PLWH.

Methods: Qualitative data consisting of 8 focus group discussions with PLWH and 14 key informant interviews with HIV health service workers, were conducted in two districts each of Uganda and Zambia. Data were collected in January 2024. Each study district held two PLWH focus groups (one with men and another with women) with 5-7 participants per group and 3-4 key informant interviews. Standardized discussion guides were used to explore types, magnitude, and drivers of cancer stigma and their potential impacts on services among PLWH. Interviews were audio-recorded, translated to English, and thematically analyzed for stigma-related content.

Results: Cancer stigma drivers included incorrect beliefs of cancer origins, structural issues, and perceptions that cancer is always a terminal illness. Limited provision of care, social isolation, and delayed diagnosis of cancer were identified as major impacts of stigma. Participants recognized programmatic needs such as improved education for providers and patients, private counseling, and peer support.

Conclusions: Study results underscore substantial cancer stigma in the study population emphasizing the need for further research informing culturally sensitive interventions that enhance educational outreach and promote engagement in care.

Better health starts with her: a community-led women's health initiative in Kibera, Kenya

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Background: In 2020, the Global Research, Implementation and Training (GRIT) Lab at USC was forced to quickly shift its large community-based youth public health training programs to respond to the COVID-19 realities. This resulted in the implementation of the Youth Public Health Ambassador program, initially launched in Lira, Uganda, and since expanded to include Kibera, Nairobi, Kenya. The program serves as a model for other youth-focused, community-based public health education, research, and policy advocacy programming effective

Description: The YPHA Program consists of an 8-month training initiative led by public health students and professionals from East Africa and the US. The program identifies and empowers 20 youths (aged 18-24) as peer educators, data collectors, and agents of change. The program consists of three distinct phases: basic public health education, implementation of a community-based participatory research study, and data interpretation and dissemination. Ambassador's proficiency in public health and leadership skills are assessed throughout.

Lessons Learned: Upon program completion in both locations, YPHAs showed greater mastery and indicated having higher confidence in all topic areas. YPHAs were also able to successfully conduct a comprehensive women's health assessment by collecting and analyzing data from female social clubs and health facilities. Results were disseminated by YPHAs within their communities and to other key stakeholders.

Next Steps: The YPHA program's findings will hopefully encourage further investment in youth-centered health promotion programming, further incorporation of youth-led programs for low-income communities, and youth-driven policy advocacy.

Global health and human capital development: rethinking productivity of older persons

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Background: Old-age dependency ratio (OADR) is a demographic measure representing the ratio between "dependent" older adults aged at least 60 and working-age adults. It is purely chronological indicator and disregards other characteristics as social background and health status.

Objectives: In this study, we integrate this traditional measure with education attainment and cognitive health to provide a better depiction of the productivity potential of older adults, considering current and projected population estimates.

Methods: Using data from the 2015 China Health and Nutrition Survey, we examined the cognitive performance decline in a sample of 4,098 adults aged at least 60. The health status estimates were integrated with the population projections from the United Nations World Population Prospects.

Results: Overall, women were observed to have lower cognitive performance scores, regardless of their residence. The OADR in China was about 24 older individuals for every 100 working-age adults. By 2065, this dependency ratio is estimated to increase to about 90 older individuals for every 100 working adults. However, when age- and education-specific prevalence were integrated during the same period, the dependency ratio was estimated to be around 75 percent lower than the traditional measure used for the 2015-2065 period.

Conclusions: The findings highlight that the concept of

old-age dependency should consider social and health characteristics; demonstrating that adults in advanced ages can continue being productive.

E-cigarettes policy variance across the Western Pacific region: a policy scan of 37 countries.

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Background: Electronic cigarettes (e-cigarettes or vaping products) are widely used to help smokers to quit - and for recreational or lifestyle reasons. The uptake of vaping among adolescents has been reported across countries in the Western Pacific Region (WPR). Much like tobacco use, e-cigarette use among non-smokers thrives in environments with weak regulation. Although there is considerable evidence of the benefits of vaping as a measure to support tobacco cessation, the long-term health impacts, including addiction remain speculative. Based on the precautionary approach, investment in regulatory measures to restrict the marketing and sales of e-cigarettes is prudent.

Objectives: To conduct a policy scan for evidence and details of, e-cigarette policies in place across all 37 countries within the WHO Western Pacific Region.

Methods: A systematic search of publicly accessible WPR government policies relating to e-cigarette policy was conducted. The inclusion criteria were that there had to be a government policy, defined as, a government-led initiative, strategy, legal response; or policy document that outlined the government's position on e-cigarettes.

Results: Our results from the policy scan reveal that countries and territories in the WPR are hugely varied concerning the evolution of their e-cigarette policy and that the policy space is changing rapidly over time. At least one government e-cigarette policy has been introduced in 24 of the 37 countries in the WPR (64.8%). E-cigarette policies are yet to be introduced or could not be in thirteen countries

Conclusions: Our review shows evidence of progress leadership on e-cigarette regulation. Amongst the most progressive were several Small Islands Developing States. Our findings suggest that there is scope for countries within the WPR to share evidence on vape policy and regulatory measures, particularly in the context of aggressive e-cigarette marketing, a broad youth consumer market and inconclusive evidence of long-term health effects.

Diet and psychological distress: the case of older adults in China

Yinglei Yang

Background: China has stepped in line with the global trend in population aging since 2000. In response to this demographic change, Chinese government formulated a series of policies on the health of older adults including psychological health to achieve 'healthy aging' goal. An often-overlooked facet of health is the relationship between diet and nutrition.

Objectives: The main aim of this study is toward understanding the association of diet and psychological which can contribute to developing healthy aging in China. The current generation of older adults were those who experienced great social and economic development of China therefore the socioeconomic and health behavioral characteristics of this age group were analyzed.

Methods: The study utilized the 2017-2018 wave of Chinese Longitudinal Healthy Longevity Survey. The analytical sample consists of community-dwelling older people aged 65 years and above. Psychological distress was measured by combining the survey items relating to feelings of isolation, anxiousness, and uselessness. Diet was measured through the dietary diversity score (DDS). The ordinary least squares method was utilized to observe the relationship of the covariates with dietary diversity.

Results: The results showed a statistical significance of the inverse association between DDS and psychological distress. Negative association of the latter was also observed among those who are males, living with household members, have increasing years of schooling, and have a good self- perceived health status and quality of life. On the other hand, older adults who receive insufficient financial support and those who are not married were related to experiencing psychological distress.

Conclusions: In this analysis, the DDS was inversely associated with the index of psychological distress. Improving dietary diversity could protect the older adults from getting negative emotion to some extent. Further studies are needed in regard of causal relationship between these two variables.

Emotional status of community-dwelling older adults in China

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Background: There have been observations hat feelings of isolation and negative affect have a circular relationship with health whereby they were associated with unfavorable health outcomes. Due to older people having a higher risk of being and feeling socially isolated, it is important to better understand negative emotions in the context of aging societies such as China.

Objectives: Among the objectives were to create an index of negative emotional status and also determine related individual and community factors.

Methods: The present study utilized the 2018 Chinese Longitudinal Healthy Longevity Survey where an analytical sample was extracted consisting of those aged at least 60 years. The index for negative affect was created through the following emotions: isolation, shame, anger, anxiousness, and uselessness. A community level perspective on the issue was important and the analytic model employed included **sociodemographic factors, and** also health status and health behaviors.
Results: A quarter of the sample experienced negative affect. Increasing age from 60 years was associated with negative emotions and levelled off at 82 years. The sociodemographic characteristics of respondents that increased likelihood of experiencing negative emotions were being female and living in towns relative to rural areas. The opposite association effect was observed among those with increasing educational attainment and sufficiency of income. Individuals diagnosed with a non- communicable disease was also likely to experience negative affect. The similar observation was found with alcohol dependence. Having proper dietary diversity and regular exercise had beneficial impact on decreasing negative affect.
Conclusions: The present examination can be taken as a means to support the need for addressing negativities in mood and emotion among those who are vulnerable, such as older people. Identifying negative emotions in communities is important, and policies conducive to social integration can be formulated to prevent isolation and the development of feelings of disconnection among individuals at advanced ages.

Cost-utility analysis of coronary artery calcium screening to guide statin prescription among intermediate risk patient Thailand: a healthcare payer perspective

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Background: Cardiovascular diseases (CVD) are the leading cause of death globally. Extensive evidence strongly supports the potential of Coronary Artery Calcium (CAC) scores as a precise tool for cardiovascular risk assessment. However, there was a lack of local evidence to support the cost-effectiveness of integrating CAC screening into primary prevention strategies within the Thai healthcare context.
Objectives: This study aims to evaluate the cost-utility of CAC screening for primary prevention in Thai patients with intermediate CVD risk, compared to the current guidelines according to the ACC/AHA guidelines 2019 recommendation.
Methods: A hybrid model combining a decision tree and Markov model was constructed to compare cost and Quality Adjusted Life Years (QALYs) from a healthcare payer perspective. The model evaluated the target population of statin-naïve individuals aged 40-80 with intermediate CVD risk. Different potencies of statin were initiated based on CAC score and ACC/AHA guidelines 2019 recommendation. The time horizon was 40 years. The service costs and related household expenses were based on the Thai setting. The incremental cost-effectiveness ratio (ICER) was then compared against the official willingness-to-pay threshold of Thailand (160,000 THB per QALYs). Probabilistic and one-way sensitivity analyses were conducted to ensure result robustness and identify the parameters that significantly influence the results.
Results: The CAC screening strategy required an incremental cost of 24,764.24 THB to gain 0.619 QALYs per person, resulting in an ICER of 40,023.54 THB per QALY gained. For probabilistic sensitivity analysis, at the official Thai threshold, the probabilities of cost-effectiveness were 30.9% for the current guideline and 69.1% for CAC screening. One-way sensitivity analysis demonstrated that the incidence of CAC and low-density lipoprotein cholesterol (LDL-C) subcategories, incidence of non- fatal stroke, and high potency statin cost were the most influential parameters in the model.
Conclusions: Our finding indicated that CAC screening strategy is probably cost-effectiveness in Thailand

Suicide prevention e-training among secondary school teachers: a missing piece in educational systems

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Background: In 2022, the global rise in adolescent suicidal thoughts and attempts has become a major concern, with Vietnam also reporting increased suicide risks among young individuals. Recognizing the crucial role of school staff and teachers in suicide prevention, our project aims to develop an online suicide prevention program for Vietnamese high school teachers during 2022-2023.
Objectives: Our initial focus is to assess the teachers' needs to enhance the program's content and effectiveness.
Methods: Interviews with twelve experts, high school teachers, and school counselors revealed a significant lack

of suicide prevention knowledge and skills among teachers. We utilized the Literacy of Suicide Scale (LOSS) developed by Jorm (2000), which includes 26 questions divided into four sub-scales: signs and symptoms, causes or nature of suicidality, risk factors, and treatment and prevention. Responses are given on a 3-point scale (true, false, or I don't know), with total scores ranging from 0 to 26. Higher scores indicate greater suicide literacy.

Results: A preliminary survey of 146 teachers showed that 76.6% had not attended any suicide prevention training, 66% had been exposed to suicide or self-harm information, and 95.7% expressed a desire for a suicide prevention program for students. The mean LOSS score among the teachers was low (M = 0.41, SD = 0.13), with a total mean score of 8.38, significantly lower than university (M = 16.5) and community samples (M = 15.1) in Calear et al. (2021).

Conclusions: To address this gap, we have established an adolescent suicide prevention e-training program for 1,250 participants. Pre- and post-assessments will be conducted to demonstrate the program's accessibility and effectiveness in addressing the rise of suicide cases in the post-COVID world in Vietnam.

Plant-produced anti-PD-1 antibody fusion with IL-15 complex shows progression in tumor growth inhibition in mouse model

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Background: Program cell death 1 (PD-1) is a primary target for cancer immunotherapy, where commercial anti- PD-1 drugs, such as pembrolizumab and nivolumab, have been widely used. However, drug resistance against anti-PD-1 antibodies has been increasingly reported. To improve drug efficacy and reduce drug tolerance, molecular structure of antibody could be modified by fusing with immunomodulatory cytokines.

Objectives: This study aimed to increase anti-tumor efficacy of anti-PD-1 monoclonal antibody by conjugating the molecule with interleukin-15 (IL-15) cytokine.

Methods: Anti-PD-1 antibody in conjugation with IL-15 complex using a flexible linker at C-terminus was designed. Plant molecular farming approach was used for producing such a fusion molecule. The efficacy of plant-produced anti-PD-1-IL-15 antibody was tested in mouse induced with colorectal tumor.

Results: The structure of anti-PD-1-IL-15 molecule was confirmed using Western blot and LC-MS analyses. In mouse study, at the dose of 3 mg/kg, it showed 94.98% tumor growth inhibition, which was stronger than the treatment with commercial anti-PD-1 antibody, resulting in 86.55% inhibition at 5 mg/kg dose.

Conclusions: Plant-produced anti-PD-1-IL-15 complex could be a potential molecule to enhance anti-PD-1 antibody efficacy and overcome antibody drug resistance in cancer immunotherapy. Plant molecular farming could be a powerful platform for producing such antibody-cytokine fusion molecules.

A new Enterocloster species promotes colorectal tumorigenesis by producing carcinogenic metabolites

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Background: We previously identified a fecal bacterial gene marker 'm3' from an unclassified bacterium to significantly increase in patients with colorectal cancer and adenoma (Liang et al. Gut 2020)

Objectives: This study isolated and characterized this m3-carrying bacterium (M3) and investigated its role in colorectal tumorigenesis

Methods: Stools with high m3 abundances were used for M3 isolation. C57BL/6J-ApcMin/+ mice were administered M3, E. coli, or broth to compare colon tumor development. Colon cancer cells were treated with M3/E. coli supernatant, or broth for *in vitro* functional assays. M3 metabolites were analyzed by non-targeted LC-MS. Gene expression profiles were analyzed by RNA-seq

Results: We isolated M3 using a target-enrichment culturing strategy from a patient with colonic adenoma, which carries the full-length m3 gene confirmed by whole genome sequencing. M3 is a strictly anaerobic, nonsporulating, nonhemolytic, gram-negative, rod-shaped bacterium with no flagella. 16s rDNA and MALDI Biotyper analysis showed M3 is closest to *Enterocloster aldenensis* (Ea), but Ea does not contain the m3 gene. We therefore propose that M3 is a new species of Enterocloster. Administration of M3 significantly increased colon tumor incidence and tumor size in mice compared with *E. coli* or broth controls. Moreover, fecal m3 abundance at sacrifice positively correlated with tumor number and tumor size in M3-treated mice. M3 supernatant significantly promoted colon cancer cell proliferation, migration, and invasion, and accelerated cell cycle G1-S transition while reducing apoptosis compared with controls. Metabolomics identified known carcinogens (styrene and 2,6-dimethylaniline) and potential oncogenic metabolites (chenodeoxycholic acid, norvaline, pyroglutamic acid, etc) produced by M3. DNA repair-related processes were significantly dysregulated by M3 treatment, involving genes in DNA damage response and repair. pCHk1 and pH2AX were verified to be downregulated by M3 in cells and mouse colon

Conclusions: This study isolated and characterized a new *Enterocloster sp.* M3, which may promote colorectal tumorigenesis by producing carcinogenic metabolites

Exploring HIV risk behavior characteristics among men who have sex with men communities associated with BUKIT different HIV-1 subtypes based on social-molecular bilayer networks

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Background: In China, multiple HIV-1 subtypes circulate among men who have sex with men (MSM), exhibiting varied transmission patterns and rates. Comprehending the characteristics of MSM communities associated with different HIV-1 subtypes is essential for designing effective intervention strategies.

Objectives: To investigate the disparities in the characteristics of MSM communities associated with diverse HIV- 1 subtypes using a social-molecular bilayer network approach.

Methods: A social-molecular bilayer network of MSM in Shenzhen, China, was constructed a series cross- sectional study in 2010-2022. The primary circulating HIV-1 subtypes in Shenzhen (CRF07_BC, CRF55_01B, and CRF01_AE) was used to establish HIV-1 molecular network. Louvain algorithm and multivariate logistic regression analysis was employed to community detection and examine the characteristics among distinct communities.

Results: Out of 4984 MSM recruited, 2115 were HIV-infected. A total of 330 communities (ranging from 2 to 285 members) with a modularity of 0.84 were identified. Compared with the MSM in mixed communities, MSM in the CRF07_BC community, more likely infected HIV (aOR = 2.36, 95% CI 1.85–3.01) and drug abuse (aOR = 1.53, 95% CI 1.13–2.07), while less likely had ?3 sexual partners (aOR = 0.68, 95% CI 0.54–0.87); MSM in the CRF55_01B community were more likely drug use (aOR = 1.89, 95% CI 1.47–2.43) and having undergone HIV testing in the past 12 months (aOR = 1.42, 95% CI 1.18–1.70); MSM in the CRF01_AE community were more likely drug abuse (aOR = 2.96, 95% CI 1.84–4.75) and seeking sexual partners via the internet (aOR = 2.89, 95% CI 1.45–5.75) or others (aOR = 2.91, 95% CI 1.37–6.18). MSM in mixed communities exhibited higher network centrality.

Conclusions: The diversity of HIV-1 subtypes is closely linked to sexually active MSM communities. Significant variations in HIV prevalence and risk behaviors exist among MSM communities associated with different HIV-1 subtypes. Tailored interventions that address the specific characteristics of these communities are imperative to effectively control HIV transmission among MSM.

Access to anti-malarial medicines in Asia Pacific regions between 2020 and 2022: a multinational cross-sectional investigation between 2020 and 2022

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Background: The process of elimination of malaria in Asia Pacific regions stagnated in past two years, partly as a result of the disruptions in access to anti-malaria drugs tools due to the COVID-19 pandemic.

Objectives: To assess the availability, accessibility and affordability of anti-malarial medicines in 6 Asia Pacific countries that weren't certified malaria-free from 2019 to 2022, including Bangladesh, India, Indonesia, Pakistan, Thailand and Vietnam.

Methods: We extracted the quarterly data for 37 anti-malarial medicines using the IQVIA database from the third quarter in 2019 to the second quarter in 2022. we used standard units (SU) sold per 1000 incident cases and US dollars per 1000 incident cases to evaluate consumption (accessibility) and expenditure (affordability). Changes of consumption and expenditure were estimated using compound annual growth rate (CAGR). Correlations between consumption and country's socioeconomic, health performance and product supplier indicators were measured using least squares (pooled) panel data regression model.

Results: Our findings showed that the three aspects of access to anti-malaria medicines varied substantially in the Asia-Pacific region, with higher levels in countries with better health performance. Between 2019-2022, all countries except Vietnam presented a decreased consumption, with GAGRs being respectively -8.25% in Bangladesh, -7.32% in India, -16.13% in Indonesia, -11.87% in Pakistan and -3.82% in Thailand. Decrease in expenditure was lower than the decrease of consumption in most of the countries except Thailand. Log quarterly anti-malarial medicine sales per 1000 case was associated with proportion of health expenditure out of total government expenditure (coefficient 1.48, 95% confidence interval 0.09 – 2.87) and the proportion of local supply (coefficient 0.41 95% confidence interval 0.07 – 0.76).

Conclusions: There has been a disruption of anti-malarial medicines during COVID-19 pandemic in Asia Pacific regions. Our results underline a strengthened health system and localized drug production to guarantee the access especially in public health emergency.

International collaborative R&D on Chinese patent medicine and its contextual factors? A panel data analysis across 49 countries from 1996 to 2022

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Background: Traditional medicine, such as Chinese patent medicines (CPMs) are particularly significant in low- and middle-income countries where access to conventional treatments is often limited. International collaboration is

needed to promote the access to traditional medicines.
Objectives: This study aims to assess global collaborative research and development (R&D) efforts and contextual factors for the CPMs in China, in the hope of improving global recognition for traditional medicine.
Methods: We identified the collaborative R&D output in scientific research, patent applications, and clinical trials phases for Chinese patent medicine from the Web of Science, Worldwide Patent Statistical Database (PATSTAT), and the International Clinical Trials Registry Platform (ICTR). Data extracted included research time, research areas, collaborative countries, and country income classification. We compared the contributions from countries in different income groups. The Zero Inflated Negative Binomial regression models were employed to investigate the association between collaborative R&D output and the characteristics of the participating countries.
Results: The percentage of R&D collaboration with low- and middle- income countries showed an increasing trend from 0% in 1996 to 11.7% in 2022. However, totally only 7.6% of the collaborative outputs come out of these regions, extremely lower compared to 92.4% from high-income countries. For every 1 SD increase in collaborator's Global innovation index, the collaborative R&D outputs increased by 131% (IRR: 2.31, 95% CI 1.23–4.33). Additionally, the total number of outputs increased by 50% (IRR: 1.50, 95% CI 1.13–1.99) with every 1 SD increase in the degree of cooperative institutionalization. The number of outputs increased by 193% (IRR: 2.93, 95% CI 2.22–3.85) with every 1 SD increase in the traditional medicine development score.
Conclusions: The collaborative efforts of low- and middle-income countries on traditional medicine have increased significantly despite their relatively lower numbers compared with HICs. Findings highlight the importance encouraging greater engagement of low- and middle- income countries in global R&D collaborations.

Distilling personal expressions on influenza vaccination in social media: a text-mining descriptive analysis on Sino Weibo in China

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Background: While influenza vaccine has been widely known among the public, the attitude and recognition from social media platform are seldomly studied.
Objectives: This study aimed to decompose the personal statements on influenza vaccination from one of the most popular Chinese social media, the Sino Weibo, to understand the public concerns on it.
Methods: Posts published in the Sino Weibo from its inception to August 2022 were scraped using the keyword "influenza vaccine", together with the corresponding comments to each post. Posts about perceptions and experiences on influenza vaccination were filtered out for analysis. Pre-trained large language model and HDBSCAN algorithm were performed to generate semantic clusters of similar sentences. The attention to a specific topic was measured by number of sentences of each cluster. The level of public engagement was measured by the number of corresponding comments in mean and standard deviation (SD).
Results: In total, 33474 sentences from 17688 valid posts were eligible for analysis. Negative experiences on vaccination (n=20568) such as adverse effects and ineffectiveness were most frequently discussed. Few people were interested in the price of vaccination (n=1660) and the payment policy (866). Influenza prevention had the highest engagement value with a mean of 28.08, followed by the valent of influenza vaccine (mean = 16.1).
Conclusions: Negative experiences in influenza vaccination were overwhelmed in China's Sino Weibo. The negative attitudes and misunderstandings on influenza vaccination in Chinese social media could undercut the efforts of influenza prevention.

The survival analysis of Coronavirus Disease 2019 (COVID-19) patients at Dr. Achmad Mochtar Bukittinggi Hospital in 2020

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Background: At the end of 2019 COVID-19 was become a global community problem. Such the rapid and uncontrolled transmission, causes the high morbidity and mortality rates due to infection of this disease throughout the world, including at Dr. Achmad Mochtar Bukittinggi Hospital (Case Fatality Rate = 10.31%).
Objectives: This study aims to analyze the survival of COVID-19 patients at Dr. Achmad Mochtar Bukittinggi Hospital in 2020 and the risk factor that affect it.
Methods: This research is quantitative research with a retrospective cohort study design. Data were taken from the medical records of COVID-19 patients in 2020 as many as 226 samples. The sampling technique was carried out by simple randomization. The analyzes used were univariate, bivariate (cox regression), and multivariate (cox proportional hazard).
Results: A total of 14.2 % patients had an event (dead), with an incidence rate is 0.012. There was a relationship and differences in the survival of COVID-19 patients based

on age, sex, hypertension, diabetes, cardiovascular disease, pulmonary disease, kidney disease, ICU, and oxygen therapy. Hypertension, pulmonary disease, age, kidney disease and cardiovascular disease are confounder, because there was a change of Hazard Ratio (HR > 10%). The most correlated and affected risk factors for the survival of COVID-19 patients were ICU.

Conclusions: COVID-19 patients who are more than 60 years old, male, have comorbidities, require ICU care and support for oxygen therapy, have a lower chance of survival. It is advisable that hospitals be better prepared to handle COVID-19 patients who require ICU care and support for oxygen therapy, to be able to control infection in hospital, and to provide health education for patients to reduce the mortality rate of patients.

Assessment of knowledge, attitudes, and practices of menstrual hygiene management among school teachers and administrators in schools with sanitary room activity compared to those without.

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Background: Lack of proper menstrual hygiene management (MHM) in schools has exacerbated girls' school absenteeism and dropout rates. Previous studies in Rwanda have shown that most students receive MHM information from teachers.

Objectives: This study assessed the knowledge, attitudes, and practices (KAP) of menstrual hygiene management among schoolteachers and administrators, in schools with sanitary room activity (SRA) compared to those without and explore further the perceptions and involvement of male teachers on MHM education.

Methods: This school based cross-sectional study was a concurrent mixed-method study, conducted in four rural districts of Rwanda in 2022. A survey was done among 538 schoolteachers and 58 school administrators from 45 schools and 8 focus group discussions (FGDs) and 8 key informant interviews (KIIs) from 8 schools were conducted. Descriptive analysis, logistic regression, and chi-square tests were used to analyze quantitative data with 95% CI, $P < 0.05$ considered as the level of significance. Inductive content analysis was used to analyze qualitative data.

Results: A total of 62.9% of participants had good knowledge scores (80%). In the bivariate analysis, knowledge score was higher among female schoolteachers/administrators compared with male schoolteachers/administrators ($P < 0.001$). Participants who had poor knowledge were more likely to agree that "During menstruation, girls should be scared" (OR 3.37, 95% CI: 1.80–6.31, $P < 0.001$). Regarding practice, participants who agreed that they support MHM, 46.6% rarely helped students. Qualitative findings revealed willingness of schoolteachers and administrators to learn and support MHM, however hindered by some socio-cultural norms around menstruation.

Conclusions: The knowledge of schoolteachers and administrators demonstrated significant efforts Rwanda has put in girls MHM. However, socio-cultural norms have impeded the transformation of good knowledge into positive attitudes and good practices of MHM and increased menstrual stigma among girls. Alongside advancing MHM training in schools, there is need to uproot socio-cultural norms/taboos at school and community level.

The spiritual care competency of healthcare providers and spiritual well-being of geriatric patients

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Background: Geriatric nursing is becoming more in demand due to the global aging population. Although spiritual care is a crucial component of geriatric patient care to promote holistic well-being, evidence points to its continuous neglect in healthcare settings.

Objectives: This study aimed to determine underlying significant relationships across four spiritual care competencies of healthcare providers and three spiritual well-being categories of geriatric patients.

Methods: A quantitative correlational approach was employed in the study. Data were obtained from three geriatric care facilities in Metro Manila using the EPICC Spiritual Care Competency Self-Assessment Tool and Spiritual Well-Being Scale (SWBS), followed by statistical data analysis and interpretation. A total of 50 healthcare providers and 110 geriatric patients participated in this study.

Results: Analysis revealed that healthcare providers are capable of providing spiritual care. However, its negative correlation with Overall Spiritual Well-Being (r = -0.99, -0.99, -0.99, -0.69; P = 0.003) suggests inadequacies. Conversely, the Religious Well-Being (P = 0.07) of geriatric patients showed no significant collection with any spiritual care competency, while Existential Well-Being (r = 0.93, 0.77, 0.80, 0.97; P = 0.03) demonstrated a significant positive correlation to all spiritual care competencies.

Conclusions: While Filipino healthcare providers can provide competent spiritual care to their geriatric patients, further assessment is needed to identify areas for improvement, as all spiritual care competencies are correlated negatively with the Overall Spiritual Well-Being of geriatric patients. On the other hand, the insignificant correlations between Religious Well-Being and all spiritual care competencies suggests that religious views and personal relationships of geriatric patients with God are

unlikely to be directly influenced. The significant positive relationships between the Existential Well-Being of geriatric patients with all spiritual care competencies connotes the importance of therapeutic communication and interventions focusing on improving quality of life and reliving one's life meaning.

Assessment of antibiotic resistance on *Aeromonas hydrophilia* and *Vibrio cholerae* isolated from red tilapia fish in Siem Reap province, Cambodia

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Background: Aquaculture plays an important part in Cambodia's food security. Moreover, Cambodian consume up to 37.5 kg of fish per person per year making it one of the highest fish consumption countries (Khut et al., 2023). Fish is the most important source with about 75% of animal protein for Cambodian, which is enormous culture production from cage culture, pond culture, rice-fish culture and others fish cultured activities in small water bodies or aquaculture-based fisheries (Edwards, 2015). Tilapia culture spread within the country in recent year as a result of increasing demand for both Nile tilapia (*Oreochromis niloticus*) and red tilapia (*O. niloticus* x *O. mossambicus*). Although Cambodians generally prefers wild-caught fish, tilapia is now widely accepted. The tilapia Sector is dependent on fingerlings of unknown source and quality imported from neighboring countries, and production practice are generally poor in Cambodia (Joffre et al., 2019). Many species of bacteria were reported to be present in aquaculture among those two major pathogens: *Aeromonas hydrophilia* and *Vibrio cholerae* are known as the major cause of burden loss and habitable due to poor practice in aquaculture such as poor water quality, overcrowding, improper fish nutrition's, and vegetation. Emerging of antibiotic-resistance *Vibrio spp*. and *Aeromonas spp*.in aquaculture is serious public health concern worldwide. Misuse and Overuse of antibiotic in aquaculture are well known and these mis-practice can promote the spread of antibiotic resistance in aquatic bacterial and, critically, transfer that resistance to human pathogen. In the culture system, merging of antimicrobial resistance (AMR) is the most challenges face in aquaculture (Preena et al., 2020).

Objectives: To identify *Aeromonas hydrophilia* and *Vibrio cholerae* isolated from red tilapia fish, determine antibiotic resistance on *Aeromonas hydrophilia* and *Vibrio cholerae* isolated from red tilapia, and compare antibiotic resistance on *Aeromonas hydrophilia* and *Vibrio cholerae* in five different districts in Siem Reap provinces.

Methods: The present study was conducted in different fish farms including Siem Reap city (KSR), Sor Nikorm district (SNK), Prasat Bakong district (BK), Banteay Srey district (BTS), and Chi Kreng District (CKR) in Siem Reap Province, Cambodia. Water sample in fish raising were measured on sited by a portable multimeter (HANNA: HI98107). Then Five red tilapia fish were collected from cages, pond in each farm randomly and put in a sterile plastic bag, respectively and were placed in an ice box during the transfer to Microbiology Laboratory in Royal University of Agriculture. Epidermal muscle, Kidney and liver tissue were collected by sterile forceps 10g and transfers to 90ml of Buffer peptone water (Himedia Laboratories Pvt. Ltd, Mumbai, India), then stomacher for 2 minutes and serially dilution up to 10-5 in Saline water (0.9%). Then transfer dilution culture onto Aeromonas Selective Agar (BSIBG, Himedia) and TCBS agar (Mercl) then plates were incubated at 35±2?for 18-24 hours for Aeromonas hydrophilia and Vibrio cholerae suspected colony were subjected to purify then subjected to biochemical tests and identified using the API 20NE and API 20E systems to identify the species of the bacteria. After bacteria were cultured in its condition, few colonies of Aeromonas hydrophilia and Vibrio cholerae of each sample were isolated on a specific media and taken to analyze antimicrobial susceptibility by the disk diffusion method (Hudzicki., 2009). The antibiotic used in this study included Ampicillin (AMP), Ciprofloxacin (CIP), Colistin Sulphate (CL), Erythromycin (E), Florfenicol (FFC), Oxytetracycline (OXT), Sulfamethoxazole (SXT).

Results: In the current study, the temperature of water samples was between 27°C to 30.7°C. Moreover, the pH values indicated hydrogen ion concentrate, this study pH values ranges from 6.66 to 9. A total of 25 Sample (N = 25) such as 44% of presumptive *Aeromonas hydrophilia* (n = 11) and 8% of presumptive *Vibrio cholerae* (n = 2) were found in fish sample. The result of antibiotic resistance for *Aeromonas hydrophilia* (n = 11) showed the highest resistant rate toward E (100%), AMP (81.81%) SXT (54.54%), FFC (45.45%) and CIP, CL, and OXT (27.27%). Moreover, the resistance of *Vibrio cholerae* (n = 2) showed OXT (50%), AMP CL, E, and FFC (100%).

Conclusions: In this study found that samples collected were presented in both bacteria and mostly multi-drug resistance. Further studies are essential for better understanding of antibiotic resistance of *Vibrio spp*. and *Aeromonas spp.* in aquacultures particularly where uncontrolled and extensive use of antibiotics may cause the frequent occurrence of multiple antibiotics resistance. The resistance of bacteria to antibiotics could be an important problem in the future, not only in fish health but also in environment and public health. It is a consequence of the widespread and often uncontrolled use of antibiotics, prophylactically and therapeutically, against diseases, and also sub therapeutically as growth promoters for aquatic farm animals, mainly fish. In this Study Commonly used antibiotic in aquaculture were selected for antibiotic susceptibility. The implications of these findings underscore the urgent need for management and control measures to mitigate the spread of AMR in aquaculture practices in Cambodia.

The role of sleep quality, commuting time, sleep environment and psychosocial factors to fatigue related incident in mining industries

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Background: Data from the Ministry of Energy and Mineral Resources (ESDM) recorded 93 accidents in mining industries in 2021, with 36 minor accidents and 57 serious accidents. The year 2019 was the worst year with 133 accidents (27 minor, 106 serious) and 24 fatalities, fatigue is one of the most concerning causes until now.

Objectives: This research aims to determine the relationship between sleep quality and work fatigue after controlled by confounding variables among heavy equipment operators in the mining industry in Indonesia.

Methods: There are eighteen covariate variables investigated whether they are confounders or not including age, powernap, mental load, work experience, gender, BMI, sleep quantity, psychological disorders, social interactions, work culture, psychosocial factors, financial anxiety, spouse support, marriage status, smoking habit, and comorbidity. Spouse and family support to sleep and financial anxiety are two unique factors that contribute the poor sleep quality. The method used in this research is the application of a cross-sectional design. This study involved 213 workers who were asked to fill out questionnaires. Data analysis was performed using multivariate risk analysis.

Results: The results of the study showed that 49.3% of workers experienced severe work fatigue, while 50.7% of respondents experienced mild work fatigue. There is a relationship between sleep quality and work fatigue (P = 0.011). Workers with poor sleep quality were 2.38 times more likely to experience severe work fatigue compared to workers with good sleep quality after controlled by work experience, commuting time, sleep environment, and psychosocial factors (overcommitment) (aOR = 2.38 95% CI 1.22 – 4.65).

Conclusions: In conclusion, this study found a statistically significant association between sleep quality and work fatigue. These findings highlight the importance of sleep for maintaining worker health and well- being. Future research can explore interventions to improve sleep quality and reduce work fatigue among employees.