

## Health Systems: Policy and Planning I

Chairpersons: M Frederick-James, N Slack-Liburd

### O – 1

**Assessing the impact of the Barbados sugar sweetened beverage tax on grocery store beverage sales: An interrupted time series analysis**

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**Objective:** A 10% excise tax on sugar sweetened beverages (SSBs) was implemented in Barbados in September 2015. We sought to determine whether there has been a change in sales of SSBs following implementation of the tax.

**Methods:** We used electronic point of sales (EPOS) data from a major grocery chain over the period January 2014 to December 2016. We calculated litres sold per week of SSBs and non-SSBs and included vinegars as a non-beverage comparison group. We used an interrupted time series design to assess whether the introduction of the tax was associated with a change in level or trend in sales. We analysed data from the same grocery chain in Trinidad and Tobago to examine overall trends in beverage sales in a Caribbean country without a SSB tax over the same period.

**Results:** The introduction of the SSB tax in Barbados was associated with a decrease in SSBs sold (litres) per week as compared to the estimated counterfactual without the SSB tax. This decrease was significant from four months after implementation. Neither Barbados non-SSBs nor Trinidad SSBs were associated with any statistically significant change following the tax.

**Conclusion:** This analysis suggests that the introduction of the Barbados SSB tax was associated with a decrease in SSB sales in Barbados. No change was observed in sales of SSBs in Trinidad or vinegar or non-SSBs in Barbados over the same period. Additional research is needed to assess possible substitution to non-taxed powdered beverages and syrups.

### O – 2

**Physical and mental health of adolescents in Latin America and the Caribbean: Societal specific context regardless of national wealth — a key consideration**

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**Objective:** Adolescents in the Caribbean and Latin America have experienced dramatic changes in opportunities and constraints over the last decade. Improvements in national incomes were accompanied by an increase in globalised risky exposures (eg fast foods). The objective of this study was to examine the prevalence of suicide-related mental health problems and overweight among adolescents, and also the perspectives of adolescents, teachers, policy-makers and parents on health priorities.

**Methods:** Indices of national incomes and human development were merged to national surveys of adolescent health (2009–2013, aged 13–16 years). Overweight/obesity was objectively measured, and information on suicide ideation, planning and attempts were used to derive a composite suicide behaviour variable. Concept mapping workshops were conducted with adolescents (n = 24, aged 11–16 years) and with teachers, policy-makers and parents (n = 15) in Guyana, one of the poorest countries and with high suicide rates.

**Results:** Generally, as gross domestic product per capita increased, the Human Development Index increased, with

Honduras, Guatemala, Guyana and Bolivia at the lower end and St Kitts and Nevis, Bahamas, Argentina, Trinidad and Tobago and Uruguay at the higher end. Overweight/obesity and suicidal behaviours were not consistently related to these indices. Adolescents' perspectives on health priorities differed by socio-economic context. Among the less advantaged, they cohered more around harmful than protective influences, while among the advantaged, emphasis was placed on protective lifestyle choices and environmental factors. Nutrition resonated with the perspectives of teachers, parents and policy-makers, among whom mental health, and family and school environments were also emphasised.

**Conclusion:** Neither overweight nor suicidal-related behaviours were consistently related to national indices of development. Specific societal contexts may be important drivers. The lack of emphasis on mental health in adolescents' perspectives in Guyana suggests that addressing these issues might be more challenging than dietary habits. Interventions that bridge families and schools could be explored.

### O – 3

#### **Integrated health systems planning as a tool to strengthen health systems in the tropical rainforest interior of Suriname**

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**Objective:** To determine the accessibility of healthcare and its impact on perinatal outcomes and surveillance following health service decentralization and proactive community engagement by the Medical Mission Primary Healthcare Suriname, for the people living in Suriname's tropical rainforest interior.

**Methods:** Medical Mission retrospective data covering five integrated health system time periods (IHSP) were analysed using descriptive statistics for core healthcare accessibility indicators: clinic visits, perinatal outcomes: birth rate, maternal mortality rate (MMR), neonatal mortality rate (NMR), and vaccination coverage; and surveillance findings on: malaria, diarrhoea and respiratory infections. Integrated health system time period 1 was defined as primary healthcare (PHC) pioneer phase (1998–2000), IHSP2: tailored PHC (2001–2005), IHSP3: improving and owning PHC (2006–2008), IHSP4: PHC through community participation (2009–2011), IHSP5: delivery of integrated PHC through collaboration and community participation (2012–2015).

**Results:** Average clinic visit rate ranged from 3.5 (IHSP1) to 1.7 (IHSP5), birth rates decreased from 35.0/1000 (IHSP1) to 24.6/1000 (IHSP5) MMR decreased from 156.3/100.000 (IHSP4) to 42.1/100.000 live births (IHSP5), NMR decreased from 5.4/1000 (IHSP3) to 5.2/1000 live births (IHSP5). Children's vaccination coverage 0–1 year increased from 68.0% (IHSP1) to 86.0% (IHSP5), and remained stable in children aged 1–2 years. Malaria cases decreased significantly from 8121/year (IHSP1) to 33/year (IHSP5), diarrhoea and respiratory infections decreased from 7789 to 5022 and 23 638 to 22 908 cases/year, respectively.

**Conclusion:** Integrated health systems planning resulted in improved healthcare accessibility, positively influenced perinatal outcomes and decreases in high priority infectious diseases. Community engagement is essential to improve integration of PHC in remote areas.

### O – 4

#### **Post-flood disaster impact of perinatal healthcare coverage on birth outcomes in the rainforest interior of Suriname**

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**Objective:** To determine potential differences in the coverage of perinatal care provided by the Medical Mission Primary Healthcare Suriname (MM) for the indigenous population in the tropical rainforest interior of Suriname following the May 2006 flood disaster and the impact on birth outcomes.

**Methods:** Medical Mission perinatal health database was used, comparing 1419 infants born two years post-flood to 1474 infants born two years pre-flood. For areas not affected by the flood within the MM service area, 896 additional post-flood births were compared to 907 pre-flood births. Binary variables measured included coverage of at least four antenatal care (ANC) visits, skilled birth attendant (SBA) at delivery, neonatal data regarding the condition of the child at four weeks, and prevalence of low birthweight, preterm birth, low five-minute interval Apgar score (1–6), stillbirth and neonatal mortality.

**Results:** There were statistically significant increases in ANC coverage (74.1% to 79.5%,  $p = 0.001$ ) and SBA (77.0% to 84.1%,  $p < 0.001$ ) in the post-disaster period. In unaffected areas, there was a decrease in ANC coverage (68.0% to 62.9%,  $p = 0.026$ ) and no significant change in SBA coverage (83.0% to 80.0%,  $p = 0.234$ ). There were no significant changes in poor birth outcome prevalence in both affected and non-affected areas.

**Conclusion:** In the aftermath of the severe flooding in the interior of Suriname that affected 60% of the indigenous population, MM coverage of perinatal healthcare remained high and in some regions improved. These changes did not impact poor birth outcome prevalence.

#### O – 5

##### **Developing a systems model to inform policies for diabetes prevention in the Caribbean: A co-design approach to engage stakeholders in policy development and evaluation**

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**Objective:** Type 2 diabetes is a serious and growing problem in the Caribbean. Progress in implementing effective policies for prevention has been slow. It is proposed that engaging policy-makers in systems thinking, such as in understanding the complex interrelationships between the determinants of diabetes, will lead to more effective policy formulation and implementation. In this paper, we present findings from a group model-building with expert stakeholders in the Caribbean.

**Methods:** In 2016, we held a group model-building workshop with stakeholders from multiple sectors across four countries (Barbados, Belize, Jamaica and St Vincent and the Grenadines). Causal system maps on the determinants in the Caribbean of physical inactivity, poor diet and obesity were developed and potential leverage points amenable to policy interventions were identified.

**Results:** Stakeholders identified social-health determinants, and their interlinkages and feedback loops driving high rates of diabetes. Examples include car-dominated urban planning and transport policies driving physical inactivity, and unhealthy eating connected to low local production of fruits and vegetables, a reliance on food imports and a lack of food sovereignty.

**Conclusion:** The group model-building workshop enabled expert stakeholders to map the systems driving high rates of diabetes in the Caribbean. This demonstrated the interconnectedness of diabetes determinants and the importance of a multi-sectoral response. The system maps form the basis for developing a quantitative system dynamics model, which can be used as a tool by policy-makers to undertake a ‘what if’ analysis of the potential effectiveness of the different types and combinations of interventions and inform decision-making.

#### O – 6

##### **Health determinants and health outcomes for low-income adults living in public housing communities: Focus on obesity, overall health and quality of life**

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**Objective:** To assess the association between select health determinants and health outcomes for low-income adults living in public housing communities in the US Virgin Islands. The specific aims of the study were to: (1) assess the overall health status, quality of life and weight status, and (2) determine the association among key health determinants and health status, quality of life and weight.

**Methods:** A concurrent, mixed-methods design (Creswell, 2009) was used. Quantitative data collection included the 2014 Behaviour Risk Surveillance Survey (developed by the Centres for Disease Control and Prevention), administered to a stratified random sample of adult residents in public housing communities, through a telephone survey. There was an 85% response rate. Quantitative data analysis was conducted using statistical package for the social sciences (SPSS) 25.

**Results:** Females represented 80% of study participants, 52% of households (HHs) were households with no children and 26% of HHs reported having two or more children. Over 60% of participants were 45 years or older; 50% had never been married and 31% were divorced, widowed or separated. Seventy per cent reported their health as ‘excellent’ or ‘very good’; approximately four in 10 reported having poor mental or physical health that kept them from usual activities; seven in 10 reported being overweight or obese. Logistic regression was used to assess the association between health determinants and health outcomes. Health determinants showed significant associations ( $p < 0.05$ ) with the dependent variables of interest.

**Conclusion:** Results have implications for policy-makers and healthcare providers, relative to care of the elderly and women’s health, specifically, obesity.

#### O – 7

##### **Availability of medicines in public sector health facilities of four vulnerable Regions (1, 7, 8 and 9), in Guyana**

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**Objective:** To conduct an assessment on the availability of essential medicines in four vulnerable regions (1, 7, 8 and 9)

of Guyana, during August to October 2017 to provide data to inform pharmaceutical management and services.

**Methods:** A retrospective analysis of 62 health facilities within Regions 1, 7, 8 and 9 was performed. Data were analysed with the statistical package for the social sciences (SPSS) 20.

**Results:** The inventory level for anti-allergic drugs was 94% and analgesic/anti-pyretic/nonsteroidal anti-inflammatory drugs (NSAID) was 76%. Antibacterial tablets were the most frequently out-of-stock medicines, anti-helminthic tablets and antibacterial injections were the medicines available in excess. Approximately, 79% of public health facilities in these four regions had storage facility with over 50% adequate number of shelves and cupboards. A storage ledger was maintained in 76% of the facilities.

**Conclusion:** Strengthening of the public sector availability of medicines is a complex long-term process. It is recommended that the Ministry of Public Health evaluate their procurement system to ensure efficiencies and make necessary reforms to improve availability. The analysis from the present study could be used as a baseline to evaluate the effectiveness of a centralized procurement and decentralized distribution systems for medicines.

## O – 8

### **Geographic information systems vector surveillance capacity building: Results from the Caribbean**

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**Objective:** The aim of the Geographic Information for Vector Surveillance (GIVeS) programme is to improve geographic information systems (GIS) capacity for vector surveillance. The data presented here represent outcomes from the Caribbean.

**Methods:** To assess existing GIS capacity for vector surveillance, the GIVeS team launched the project with a baseline needs assessment. Next, we developed a curriculum focussed on using QGIS, a free and open source software. Two trainings were conducted in July 2017 that included 44 participants from 19 Caribbean countries. Participants were entomologists and key vector surveillance decision-makers. Individual learning was assessed using pre- and post-tests. A quantitative survey of participants was conducted to assess course effectiveness and success. Quantitative data were entered and analysed in Epi info 7.

**Results:** Forty-three participants completed the pre- and post-test assessments. Ten per cent reported being comfortable with GIS software in pre-test compared to 61% post-test. Only 26% of participants reported that they could create maps from entomological surveys before the workshop; nearly all (95%) reported they could do so at post-test. The pre-test assessment revealed that 26% of participants were incapable of accessing/creating spatial data, which dropped to zero after the workshop.

**Conclusion:** The GIVeS programme successfully met its objectives, receiving positive feedback across evaluation metrics. Vector programmes focussed on other diseases may benefit from the adoption of the GIS software. To that end, we intend to develop a second-level training for countries that have already participated in our training and expand our geographic focus outside of the Latin America and the Caribbean Region.