



CODEN [USA]: IAJPBB

ISSN: 2349-7750

INDO AMERICAN JOURNAL OF  
**PHARMACEUTICAL SCIENCES**

Available online at: <http://www.iajps.com>

Research Article

**HEALTH PROMOTION AND PLANETARY HEALTH:  
ADDRESSING ADVERSE HEALTH EFFECTS OF CLIMATE  
CHANGE IN PAKISTAN**

Mirza Jawad Ghazanfar Baig, Aisha Ahmed, Gurpreet Singh Aujla\*

Article Received: June 2019

Accepted: July 2019

Published: August 2019

**Abstract:**

*Planetary health is a new concept that essentially means that human, environmental and animal health are interdependent rather than independent and are interrelated to each other and health of one is dependent upon the other. "Climate change is real" [1], and this change in climate around us is depicted by increased temperatures, changing sea levels. The concept of climate change is not a substance of scientific assumption anymore and is becoming a ground fact. The impact of climate change on human health is not identical around the world but varies depending upon geographical location, environmental condition and the level of economy. Countries in low income groups are expected to suffer more than others in terms of the adverse effects of the climate change on health. Pakistan is a low socio-economic country and is highly susceptible to the adverse effects of climate change. Health promotion can play a vital role in addressing the health effects of the changing climate in many ways. Health promotion practitioners can not only help the population to adept the climate change but also to mitigate these effects and these measures will contribute in a decrease of the greenhouse gas emission and will also aid to reduce the harmful health effects of climate change. Health promotion practitioners can utilize the action areas of the Ottawa Charter for health promotion to effectively address the health impacts of climate change to advise the policy makers, strengthen the community actions and also develop personal skills so that the adverse health effects can be minimized and rectified.*

**Key Words:** Planetary, Climatic, Vulnerability

**Corresponding author:**

**Dr. Gurpreet Singh Aujla,**  
*gurpreetaujla719@gmail.com.*

QR code



*Please cite this article in press Mirza Jawad Ghazanfar Baig et al., Health Promotion and Planetary Health: Addressing Adverse Health Effects Of Climate Change In Pakistan., Indo Am. J. P. Sci, 2019; 06[08].*

**INTRODUCTION:**

Planetary health is a concept introduced recently substituting the concepts of One health and EcoHealth with prominence on the necessity for sustainability centered on natural planetary resources [2]. Planetary health essentially means that human, environmental and animal health are interdependent [3] rather than independent.

Planetary Health identifies that human health and our planet are indistinguishably associated relying on human health, thriving natural structures and resources [4] and that damage to or suffering of one will inevitably damage the other. The concept stresses to look after and promote health, avert disease, eradicate circumstances that threaten wellbeing and nurture pliability and adaptability. But our activities must consider the delicacy of the planet and responsibility to protect the environment in which we coexist. Planetary health is conserving the planet which is a necessity for sustainability and nourishment of the multiplicity of life in existence [5]. The fundamental in the Planetary Health concept is the health of generations is dependent on people, communities and population [6], with focus on fairness in health related to socioeconomic, location and gender [5]. Planetary Health also necessitates sustainability grounded on natural sources and diversity [6].

**Climate change and health:** Climate change poses a main but rather unfamiliar encounter. Climate change can affect health in a number of ways. The effects of climate change on health are expected to be negative and people living in the low income countries or living with a low socio-economic status [7] are the most vulnerable to these effects [8]. 2.4% global diarrhoea and 6% malaria in low-income countries was due to climate change in the year 2000.

The evidence of the impacts of climate change on human health is accruing. Health effects of climate change can occur in three different ways which are direct, indirect, and systemically arbitrated health effects and the extent of these effects is defined to an extent by the conditions of the affected population [9]. The direct effects are usually due to extremes weather which includes short term illness or injuries to mortality, decreased output and interference in routine domestic activities. Indirect health effects are the result of environmental and ecological disturbance that occurs due to climate change like malnutrition because of decreased local agriculture, spread of vector-borne and infectious disease and mental health issues caused. Systemically arbitrated impacts on health include starvation, skirmishes, economic effects and displaced population [10, 11].

Climatic conditions are basis of different vector-borne [12], enteric [13] and water related illness [14]. Disparities in climate and infectious disease are most obvious in vulnerable population and locations with highly variable climate [7]. Infectious disease spread is expected to change as a result of emerging climatic changes. Most of the diarrhoeal illness varies according to season suggestive of relationship to changing climate. Changes in infectious disease transmission patterns are a likely major consequence of climate change [11]. Increased heat waves can raise cardiovascular and respiratory illness resulting in high morbidity and mortality. In Pakistan, a massive increase in Acute conjunctivitis has been noticed due to heavy rainfall and flooding. Also food uncertainty, malnutrition and scarcity of clean water give intensify infectious illness [15].

**Pakistan Vulnerability:** The concept of climate change is not a substance of scientific assumption anymore and is becoming a ground fact. The impact of climate change on human health is not identical around the world but varies depending upon geographical location, environmental condition and the level of economy. Countries with low income suffer more than others.

Pakistan is a developing country with very low health indicators. It is extremely susceptible to the adversative effects of climate change demonstrated by increasing temperature, melting of glaciers and an upsurge in the incidence and intensity of dangerous weather and natural calamities. The high susceptibility of Pakistan to the adverse effects of climate change is due to many issues. Pakistan is extremely reliant on upon rain-fed agriculture for income and food. With water scarcity any variability in rainfall will put stress on agriculture. Lack of appropriate monitoring system to forecast extreme events in time is another issue which not only brings huge economic burden [16] but also poses great health risks. Majority of the people have low socio-economic status missing the ability to cope with the risks related to climate change. Women, children and elderly are the most vulnerable. Almost 40% of the population is highly susceptible to the effects of disaster [17].

The effects of climate change are demonstrated not just by the location of the country but are also not uniform within the country due to massive differences in socio-economic status and available resources in different parts of the country [15]. Pakistan is a tropical region with an expected rise in temperature of 0.4- 4.5 °C by the year 2070 [18]. Plasmodium falciparum, malaria and dengue fever are endemic in the country [19]. Increase in temperature, rain and moisture in Pakistan has been linked to increased incidence of malaria [20]. In

Punjab it has increased five folds linked to increased rainfall [19]. Pakistan like many other countries in the region is experiencing high dengue incidences which are majorly related to changing climate [21] attributed to a rise in the temperature [22].

**Purpose:** Climate change is one of the major threats to global health in the 21<sup>st</sup> century. The threats presented by the increased occurrence and severity of dangerous weather conditions and strain which can be physical, emotional and financial to health of individuals and populations demands careful planning in order to decrease the extent of the harm. Increasing temperatures lead to damaging air contamination and aeroallergens and bigger risk of food borne diseases. The shifting climate affects food and water safety, high risks from vector borne diseases, and psychological effects for populations. Health services are positioned under increased burden during extreme events, pharmaceutical and medical supplies get squeezed, health and emergency professionals are effected personally which limits their capability to act in extreme conditions [23].

The purpose of this report is to highlight the impacts of climate change on health on the population in Pakistan and the possible health promotion strategies that can be adapted in order to mitigate these adverse effects. Pakistan has a majority of population living in low socio-economic conditions, the health system is weak, the country is highly susceptible to the adverse effects of climate change and the resulting health effects due to the geographical location and has been a victim of various natural disasters in recent years. Health promotion can play a very important role in not only addressing the current health issues but also to develop sustainable options for the population to understand and practice more environment friendly options. This will not only have immediate health benefits for the population but will also reduce the environmental burden and will add to the health of the planet adhering to the concept and target of planetary health.

**Role of Health Promotion in addressing health effects of climate change:** WHO climate change and health design has four key aims advocacy and raising awareness, reinforce alliances, improve scientific confirmation and strengthen health system [24]. Health promotion practitioners can play a vital role to tackle the adverse health effects of climate change to the population. The knowledge and adherence [25] of health promotion professionals regarding the Ottawa Charter for health promotion is the key to deal with the health impacts of climate change states “any health promotion strategy should include the protection of the natural environmental and conservation of resources” [26]. The essential

skills of health promotion include the tackling of health effects of climate change [27].

Health promotion can play a very important role in capacity building of the community [28]. Health promotion practitioners are skilled in multidimensional tactics for active and competent action for climate change related health issues through educating the population and leaders regarding the adverse health effects and the associated benefits for the suggested changes, providing evidence for decision making and effectively working with the community [26].

**Health promotion response to the challenge:** According to Ottawa Charter [29] Health promotion is related to physical, communal and mental health of people by giving them control to the factors that affect the health. This can be achieved through the provision of situations and supportive environment, information related to health and appropriate immunisation [30].

It has been suggested that Multi-level approach in the intervention [31], combining communication for community education and moderate transformations have a much superior effect as compared to single approach which only targets individuals.

**Strengthening community action:** Through Health Promotion activities, Community building plans can be established to help the community to adapt to changing climate which will not only protect from existing climatic conditions but will also help to tackle future changes in the climate [11]. This adaptation can include plans from the members of the community and policy makers to decrease the effects of climate change on health. This community build up has to occur at all levels of the community and the authorities to counter the climatic impacts which are largely inter connected to affected population or are geographically region specific [32]. These plans also need to cater the capacity building for the community in terms of better facilities which in turn will decrease the vulnerability of these specific communities [33].

Another concept that health promotion practitioners can use is the social capital which is the individual and group interactions and the importance for the government to provide facilities that can cater this concept. This will help likeminded people to work on the issue of climate change and support the implementation of any measure that can mitigate climate change within the community. The government can support this concept through institutional measures and synergy [34]. Health promotion practitioners can also play a vital role in building resilience of the community which will allow the community to effectively react to any

climate change related calamities and to recuperate from the effects [35]. Social capital and resilience together can effectively reduce the vulnerability of the community against the adverse health effects of climate change [36].

A wide-ranging tactic to health promotion inspires people to accept and retain individual behaviours that avert disease and endorse health, deject harmful behaviours and aid participation in health promoting behaviours. It also aids to eliminate health risks from the physical and social environment and provide a better health promoting environment [37].

**Supportive Environments:** Supportive environments present shield from aspects that can endanger good health. They nurture involvement in healthy activities and provide a chance to populations for development of their competences and self-dependence which is crucial for individual-centred tactic to health. A key feature of supportive environments is to make healthy choices not only available for the population but also making them the easiest choices [38].

The environment shapes the choices that are available for the community for life and also presents risks. It has been recommended to reduce the greenhouse gases, energy efficient places and practices and forestation. Adverse health effects of climate change can be mitigated through changes in transportation, wise use of space and energy efficiency which in turn will reduce the change in climate [39]. Exposure to climate change effects is associated to the environmental condition of the geographical location, socio-economic status and available resources for people [40]. Supportive environment can be created for the vulnerable communities through better housing, availability of parklands, increased public transport and open spaces [40]. The most organized method of dealing with the health and climate change is through a location-based health promotion strategy to develop a healthy city. This approach is provided in collaboration with the government and policy makers and looks upon the better environmental approaches which in turn mitigate climate change [41]. This approach is line with Ottawa charter for health promotion through a complete education related to environment, water efficiency and biodiversity. Creating supportive health promoting environment has numerous aspects including tobacco control policies and legislations, educating communities in vulnerable areas, ensuring impartial access to facilities, involving community in policy making and creating and promoting health at workplaces [38].

**Develop Personal Skills:** Exploration of the impacts of changing climatic conditions on human

health have mainly concentrated on the effects of dangerous weather conditions and infectious disease, with a lack of appropriate and sufficient data available and research into the ancillary effects of the climate change that may affect social, financial and demographic conditions of the human society. To address the effects of climate change, strategies have to be focussed on both mitigation and adaptation to minimize the health effects imposed by the changing climatic conditions. Mitigation should be focussed on the reduction of greenhouse gas emission and adaptation strategies should be able to facilitate human capability to not only decrease but also utilize the existing effects of climate change on health.

Pakistan being grouped into a low-income country which has been recognized to be affected by climate change. Developing personal skills of the population as described earlier will not only decrease the emission of greenhouse gases but will also prepare the population to address the health effects of the climate change with an understating of the existing health effects already affecting the population. Mass education and information needs to be provided to increase energy efficient household approaches which will also help to decrease the financial burden on the population. Efficient water usage also needs to be addressed and personal skills need to be developed to promote water efficient approaches. Knowledge about the beneficial effects of the use of public transport on the climate and the resulting health benefits also need to be promoted. Another very important aspect is to promote the effects of greenspaces both at the household and community levels [42].

**Reorient Health Services:** There is a sheer deficiency of understanding within the health system and professionals about the dangers to health resulting from climate change and the significance of guarding health through effective adaptive measures [23]. One of the vital tactics for shielding health from climate change is to augment awareness of climate change and health amongst health and medical professionals. This involves leadership from the government through the development of policies and programs to cater this drawback and effectively engage health professionals from all areas of the health sector along with other players from the health system to elaborate the health effects of the climate change and also the understanding of these effects [43].

Adaptations to climate change are not part of the actions for most health departments at this stage and that will need support in making a shift to incorporate such activities. Public health nurses are deficient of the knowledge and approaches towards climate change and also lack a comprehensive

understanding of human prompted climate change and its consequences. Refining climate literacy amongst healthcare workers is an important adaptive approach which has been overlooked in health policy. Ongoing professional development courses related to climate change and health are required for the existing healthcare staff and teaching the future healthcare workers must be a precedence [44]. Observing the climatic risks and arranging for them in terms of tracking the health impacts of climate change and evaluate the adaptive procedures available has to be an essential responsibility of the government [23].

**Establishing healthy public policies:** Public health has grown into a leading methodology that condenses principles of both public health and health promotion to improve the health of the whole population through the reduction of health inequalities [45]. The basic principle of public health promotion relies on the concept of social justice and fairness. Though, evidence of the effects of policy on public health are very strong, it has essentially continued to be merely educational and hypothetical, and only insufficient efforts have been made to utilize this evidence to assist policy formulation, which clearly depicts a void between evidence and public health policy preparation and application [46].

Public health methodology outspreads the usual description of health from mere lack of disease to a broader context to include ability to follow goals, obtain education and growth. It also identifies that health is subjective to aspects outside healthcare which may include social, political, financial and environmental factors [45]. There has been a strong imbalance of investment in the provision of treatment and care to patients as compared to preventive activities. Conversely, almost 40 percent of mortality is resultant of behavioural issues which can be altered through preventive interferences [47]. There is a developing concern amongst researchers to apprehend strategy development and application in health promotion. Health policies are supposed to be a perfect instrument to promote healthy way of life but this regularly fails to be true [48]. Public health and health promotion have inclined to be dependent upon outdated knowledge for the guidance and improvement of health policy and programs. Policy change is vital for health promotion as the improvement of health policy is accepted as a foundation for public health and to create facilities and opportunities to reveal the ambitions of the relevant government departments [49]. Carrying out population health policies, therefore, requires policy change through critical collaborations across relevant sectors, as well as partnerships between stakeholders in academia, government, health, and healthcare [45].

Population health promoters need to be extra intelligent politically in addressing the determinants of health [50]. Political actualities and institutional configurations are frequently overlooked while persuading health policies. To make these policies successful, social science approach on policy change has to be assimilated into the population health approach [45].

Policy makers should be involved as significant stakeholders in the process of research and further into the policy change in public health which will successfully create a better understanding of the existing policy complications and an opportunity to devise the appropriate solutions and this process should be undertaken with an understanding of the existing regional boundaries of various institutions and also the decision powers vested in various systems in the country [46]. It is vital to make sure that appropriate people are involved in the process, including those decision makers. On the other hand, it is also imperative to involve people from vulnerable groups with the utmost of the potential benefits and people from the civil society who can push for accomplishment [51]. It is imperious to understand the role of social sciences on policy change and how they could be assimilated into the public health approach to effectively formulate and execute the policies related to public health and have to be pushed and promoted considering this very important and decisive factor [46].

Public health and health promotion professionals have an important role in influencing concepts to develop healthy relationships with the policy makers through emphasis on the existing knowledge and the desired outcomes [46].

### CONCLUSION:

Health promotion encourages individual and communal development through the provision of evidence, education for health, and improving life skills which in turn enhances the existing choices to people in order to exercise additional control over their health and also the surrounding environment making healthy choices. Empowering people to acquire and prepare to handle chronic illness and injuries is crucial. This has to be assisted in school settings, households, workplaces and in the community. Action is essential from all sectors of life including education, professional, commercial and other sectors with a focus not only on the external achievements but within the sectors as well [52].

Climate change poses great concerns and major threats to the health and wellbeing of the population in Pakistan which is a very vulnerable country in terms of its location and due to the prevailing circumstances of the population. Health promotion

approaches towards environmental and health sustainability are vital in order to address this issue. It is imperative that the health promotion activities have to adapt to changing climate and introduce multidimensional approaches [53]. There is a sheer need to develop partnerships by the health promotion practitioners with other stakeholders and application of multi sectoral initiatives [31].

#### REFERENCES:

- Bain, P.G., et al., Promoting pro-environmental action in climate change deniers. *Nature Climate Change*, 2012. 2(8): p. 600.
- Lerner, H. and C. Berg, A comparison of three holistic approaches to health: One health, ecohealth, and planetary health. *Frontiers in veterinary science*, 2017. 4: p. 163.
- Panorama. The health of humanity depends on the health of our planet. Our future depends on strengthening both. 2018 [cited 2018 14/9/2018]; Available from: <http://panoramaglobal.org/planetary-health/>.
- UNFCCC. Planetary Health. 2018 [cited 2018 14/9/2018]; Available from: <https://unfccc.int/climate-action/momentum-for-change/planetary-health>.
- Horton, R., et al., From public to planetary health: a manifesto. *The Lancet*, 2014. 383(9920): p. 847.
- Whitmee, S., et al., Safeguarding human health in the Anthropocene epoch: report of The Rockefeller Foundation–Lancet Commission on planetary health. *The Lancet*, 2015. 386(10007): p. 1973-2028.
- WHO. Special Issue on World Health Day 2008 theme: Protecting Health from Climate Change. 2008 [cited 2018 15/9/2018]; Available from: [http://environmentportal.in/files/Regional\\_Health\\_Forum\\_Volume\\_12\\_No\\_1\\_RHF-vol12.pdf#page=51](http://environmentportal.in/files/Regional_Health_Forum_Volume_12_No_1_RHF-vol12.pdf#page=51).
- Haines, A., et al., Climate change and human health: impacts, vulnerability and public health. *Public health*, 2006. 120(7): p. 585-596.
- Parry, M., et al., Climate change 2007-impacts, adaptation and vulnerability: Working group II contribution to the fourth assessment report of the IPCC. Vol. 4. 2007: Cambridge University Press.
- Kjellstrom, T. and A.J. McMichael, Climate change threats to population health and well-being: the imperative of protective solutions that will last. *Global health action*, 2013. 6(1): p. 20816.
- Organization, W.H., Climate change and human health: risks and responses: summary. 2003.
- Bostan, N., et al., Dengue fever virus in Pakistan: effects of seasonal pattern and temperature change on distribution of vector and virus. *Reviews in medical virology*, 2017. 27(1): p. e1899.
- Patz, J.A., et al., Impact of regional climate change on human health. *Nature*, 2005. 438(7066): p. 310.
- McMichael, A.J., Global climate change and health: an old story writ large. *Climate change and human health: Risks and responses*. Geneva, Switzerland: World Health organization, 2003.
- Malik, S.M., H. Awan, and N. Khan, Mapping vulnerability to climate change and its repercussions on human health in Pakistan. *Globalization and health*, 2012. 8(1): p. 31.
- Aslam, A.Q., et al., Vulnerability and impact assessment of extreme climatic event: a case study of southern Punjab, Pakistan. *Science of the Total Environment*, 2017. 580: p. 468-481.
- Haq, K., Human development in south Asia 2005: Human security in South Asia. Report of the Mahbub ul Haq Human Development Center. 2005, Oxford University Press, Oxford, UK.
- Watson, R.T., M.C. Zinyowera, and R.H. Moss, Climate change 1995. Impacts, adaptations and mitigation of climate change: scientific-technical analyses. 1996.
- Githeko, A.K., et al., Climate change and vector-borne diseases: a regional analysis. *Bulletin of the World Health Organization*, 2000. 78: p. 1136-1147.
- Bouma, M., C. Dye, and H. Van der Kaay, Falciparum malaria and climate change in the northwest frontier province of Pakistan. *The American journal of tropical medicine and hygiene*, 1996. 55(2): p. 131-137.
- Gubler, D.J., Epidemic dengue and dengue hemorrhagic fever: a global public health problem in the 21st century, in *Emerging infections 1*. 1998, American Society of Microbiology. p. 1-14.
- Watts, D.M., et al., Effect of temperature on the vector efficiency of *Aedes aegypti* for dengue 2 virus. *The American journal of tropical medicine and hygiene*, 1987. 36(1): p. 143-152.
- Samet, J., Public health: adapting to climate change. *Issues Brief*, 2010. 10(06).
- WHO. Health policy and climate change. [cited 2019 2/07/2019]; Available from: [https://www.who.int/globalchange/health\\_policy/en/](https://www.who.int/globalchange/health_policy/en/).
- Butler, C.D. and S. Friel, Time to regenerate: ecosystems and health promotion. *PLOS medicine*, 2006. 3(10): p. e394.
- Chastonay, P., et al., Climate change: an opportunity for health promotion practitioners? 2015, Springer.
- Barry, M.M., et al., The Galway Consensus Conference: international collaboration on the development of core competencies for health promotion and health education. 2009. 16(2): p. 05-11.
- Sulda, H., J. Coveney, and M.J.P.h.n. Bentley, An investigation of the ways in which public

- health nutrition policy and practices can address climate change. 2010. 13(3): p. 304-313.
29. Organization, W.H., Ottawa Charter for Health Promotion. Geneva, Switzerland: WHO; 1986. 1986.
  30. Walker, R., et al., Health promotion interventions to address climate change using a primary health care approach: a literature review. *Health Promotion Journal of Australia*, 2011. 22(4): p. 6-12.
  31. A. Smith, J. and A. Capon, Addressing climate change through health promotion in Australia. *Health Promotion Journal of Australia*, 2011. 22(4): p. 3-4.
  32. Ebi, K.L. and J.C. Semenza, Community-based adaptation to the health impacts of climate change. *American journal of preventive medicine*, 2008. 35(5): p. 501-507.
  33. Ayers, J. and T. Forsyth, Community-based adaptation to climate change. *Environment: science and policy for sustainable development*, 2009. 51(4): p. 22-31.
  34. Webb, T. and J. Cary, Social capital and natural resource management: An application to Landcare. *Rural Society*, 2005. 15(2): p. 119-131.
  35. Cutter, S.L., et al., A place-based model for understanding community resilience to natural disasters. *Global environmental change*, 2008. 18(4): p. 598-606.
  36. Ford, J.D., Dangerous climate change and the importance of adaptation for the Arctic's Inuit population. *Environmental Research Letters*, 2009. 4(2): p. 024006.
  37. Brown, E.R., Community action for health promotion: a strategy to empower individuals and communities. *Int J Health Serv*, 1991. 21(3): p. 441-56.
  38. Department of Health and Human Services. Supportive environments. 2019 [cited 2019 14/6/2019]; Available from: [https://www.dhhs.tas.gov.au/wihpw/principles/supportive\\_environments](https://www.dhhs.tas.gov.au/wihpw/principles/supportive_environments).
  39. Younger, M., et al., The built environment, climate change, and health: opportunities for co-benefits. *American journal of preventive medicine*, 2008. 35(5): p. 517-526.
  40. Harlan, S.L., et al., Neighborhood microclimates and vulnerability to heat stress. *Social science & medicine*, 2006. 63(11): p. 2847-2863.
  41. Bentley, M., Healthy cities, local environmental action and climate change. *Health Promotion International*, 2007. 22(3): p. 246-253.
  42. Rowe, R. and A. Thomas, Climate change adaptation: a framework for local action. Southern Grampians and Glenelg Primary Care Partnership (Policy signpost no. 3). Melbourne: The McCaughey Centre, University of Melbourne, 2008.
  43. ACT Government, Community Engagement Strategy on Climate Change, E.a. Planning, Editor. 2014.
  44. Weaver, H.J., et al., Climate change and Australia's healthcare system—risks, research and responses. *Australian Health Review*, 2010. 34(4): p. 441-444.
  45. Lavis, J.N., S.E. Ross, and J.E. Hurley, Examining the role of health services research in public policymaking. *The Milbank Quarterly*, 2002. 80(1): p. 125-154.
  46. Béland, D. and T.R. Katapally, Shaping policy change in population health: policy entrepreneurs, ideas, and institutions. *International journal of health policy and management*, 2018. 7(5): p. 369.
  47. McGinnis, J.M., P. Williams-Russo, and J.R. Knickman, The case for more active policy attention to health promotion. *Health affairs*, 2002. 21(2): p. 78-93.
  48. Rütten, A., P. Gelius, and K. Abu-Omar, Policy development and implementation in health promotion—from theory to practice: the ADEPT model. *Health promotion international*, 2010. 26(3): p. 322-329.
  49. Bryant, T., Role of knowledge in public health and health promotion policy change. *Health Promotion International*, 2002. 17(1): p. 89-98.
  50. Kickbusch, I., The political determinants of health—10 years on. 2015, British Medical Journal Publishing Group.
  51. Krech, R., Healthy public policies: looking ahead. *Health promotion international*, 2011. 26(suppl\_2): p. ii268-ii272.
  52. Mcqueen, D.V. and L. De Salazar, Health promotion, the Ottawa Charter and 'developing personal skills': a compact history of 25 years. *Health promotion international*, 2011. 26(suppl\_2): p. ii194-ii201.
  53. Patrick, R. and J. Kingsley, Exploring Australian health promotion and environmental sustainability initiatives. *Health Promotion Journal of Australia*, 2016. 27(1): p. 36-42.
- 54.