



Cancer risk reduction in the US Affiliated Pacific Islands: Utilizing a novel policy, systems, and environmental (PSE) approach



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ABSTRACT

Background: The Health Directors of the US Affiliated Pacific Islands (USAPI) declared a State of Emergency due to epidemic proportions of lifestyle diseases: cancer, obesity and other non-communicable diseases (NCDs) in 2010. This paper describes the development, implementation, and evaluation of a USAPI policy, system and environment (PSE) approach to address lifestyle behaviors associated with cancer and other NCDs.

Methods: Each of USAPI jurisdictions applied the PSE approach to tobacco and nutrition interventions in a local institution, faith based, or community setting. A participatory community engagement process was utilized to: identify relevant deleterious health behaviors in the population, develop PSE interventions to modify the context in which the behavior occurs in a particular setting, implement the PSE intervention through five specified activities, and evaluate the activities and behavior change associated with the intervention.

Results: PSE interventions have been implemented in all USAPI jurisdictions. Current human and financial resources have been adequate to support the interventions. Process and behavior change evaluations have not been completed and is ongoing. Personnel turnover and maintaining the intervention strategy in response due to shifting community demands has been the biggest challenge in one site.

Conclusion: From 2014 through 2016 the PSE approach has been used to implement PSE interventions in all USAPI jurisdictions. The intervention evaluations have not been completed. The PSE intervention is novel and has the potential to be a scalable methodology to prevent cancer and modify NCD risk in the USAPI and small states.

1. Introduction

In 2010, the Directors of Health of the United States Affiliated Pacific Islands (USAPI) declared a Regional State of Emergency due to epidemic proportions of lifestyle diseases: cancer, obesity, and other non-communicable diseases (NCDs) [1]. The declaration was put forth to mobilize resources and bring greater focus on prevention, screening, and treatment of cancer and NCDs. Between 2010 and 2016, many of the local cancer and NCD programs were reorganized, additional funding was found, the output and performance of the health programs were heavily scrutinized, and new methods to more effectively address the cancer, obesity, and NCD epidemic were sought.

Lifestyle diseases are associated with prolonged exposure to three modifiable lifestyle behaviors: smoking, unhealthy diets, and physical inactivity. In the USAPI, several public health and population health measures have been employed to decrease exposure to unhealthy lifestyle behaviors and to promote healthy behaviors. These include interventions based on the individual (health counseling, clinical

interventions) and health policy interventions (tobacco tax, quality food control, health education in schools). Interventions that address the social determinants of health (poverty, population education achievement, unhealthy environments) have been difficult to implement and were pursued to a much lesser extent.

The USAPI health services in partnership with the University of Hawai'i, and supported by Centers for Disease Control and Prevention (CDC) grants, is developing and evaluating a novel approach to modify lifestyle behaviors and thereby reduce the USAPI population risk for cancer, obesity and NCDs. This paper discusses the USAPI experience with the development and implementation of the policy, systems, and environment (PSE) approach to changing deleterious lifestyle behaviors.

The USAPI are composed of two United States (US) Territories (American Samoa (AS) and Guam), the Commonwealth of the Northern Mariana Islands (CNMI), and three sovereign countries, the Federated States of Micronesia (FSM), Republic of Palau (ROP), and the Republic of the Marshall Islands (RMI). The FSM, ROP, and RMI are freely

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Table 1
Life Expectancy at Birth in the USAPI.

USAPI Jurisdiction	Life expectancy at birth
American Samoa	72.7 (2012)
Commonwealth of the Northern Mariana Islands	76.9 (2010)
Federated States of Micronesia	70 (2010)
Guam	78.5 (2012)
Republic of Palau	64 (2012)
Republic of the Marshall Islands	71.8 (2011)
US	79 (2012)

associated with the US through their respective treaties called Compacts of Free Association (COFA). The COFA describe the political, economic, and military relationship between the US and these three sovereign island nations.

There are over 450,000 people in the USAPI [2]. The USAPI is culturally diverse with at least 12 main languages spoken. The economies and stages of development of the USAPI vary widely. In 2016, the FSM was classified by the World Bank as a low-middle income country; the RMI, ROP, and AS were middle income countries, and the CNMI and Guam are considered high income countries.

Life expectancy at birth in the USAPI are shorter than those living in the US [3]. (Table 1)

The World Health Organization (WHO) estimates that 75% of deaths in the Pacific are caused by NCDs [4]. Notably, cancer is now the second most common cause of death in nearly all USAPI jurisdictions with 37% of cancer patients dying within 5 years of diagnosis [5]. Currently, the top two cancers in the islands are breast and lung/bronchus [2]. In Guam, the lung cancer mortality rate of Micronesians is more than double the US rate.

Approximately 83% of cancers in the USAPI are associated with tobacco or obesity/overweight. Of the top five cancers in the USAPI, three are linked to tobacco use and second hand smoke (lung/bronchus, colorectal, liver) and four cancers are associated with obesity/overweight (breast, prostate, colorectal, liver) [2]. Whereas, the adult tobacco current smoker rates are 18% in the US, the USAPI smoker rates range from 17% to 57% [6]. Youth smoker rates range from 14% of females in American Samoa to 58% of males in the Republic of Palau [7].

In 2014, as noted by the World Health Organization global health statistics, of the top 12 countries with the highest prevalence of obesity among adult males, nine were in the Pacific Region, of which three were part of the USAPI [8]. The adult composite overweight and obesity prevalence range from 60% in Pohnpei to 94% in American Samoa [9–14]. The overweight and obesity prevalence of high school youth range from 26.5% in the Republic of the Marshall Islands to 60.3% in American Samoa [15–22]. Obesity prevention is a crucial issue for cancer control in the USAPI.

2. Policy, system and environment – methods

2.1. Defining the policy, system and environment approach

A policy, systems and environmental (PSE) approach in the USAPI aims to reduce the risk for cancer and other NCDs. The PSE approach is population based and includes: a) identifying a deleterious health behavior that is associated with an increased risk for cancers and NCDs; b) identifying the setting where the behavior is prevalent; c) identifying PSE interventions which are stakeholder developed, community relevant and sustainable to change the behavior; d) implementing the intervention through five specific activities in a particular setting (assessments, garnering community support, training/education programs, media promotion, signage); e) monitoring the progress of the activities through process evaluation metrics; and f) assessing the change in the targeted health behavior in the respective setting. (Table 2)

The setting for the PSE intervention may be the community (geographic, ethnic, faith based, gender based, business); a system (school, health-care complex, institution); or a natural/built environment. A defined PSE intervention is implemented to modify the context in which health behaviors are made, i.e., to make healthy behaviors the default choice, to make healthy choices possible and desirable, and/or to make an unhealthy behavior difficult within the target setting.

The selected PSE intervention is often integrated into an existing infrastructure and is practical, available, and accessible to all community members [23]. Several PSE communities in the US have formed coalitions to advance PSE strategies since 1990 [24]. The PSE concept is drawn from behavior change theory and social ecology models of health [25].

A characteristic of PSE change is that all members of that community or system have equal exposure to the modified environment irrespective of their socio-economic standing, education, or culture. Further, an individual community member would necessarily have to inconvenience themselves to avoid the change created by the intervention.

A PSE intervention may be policy, systems or environmentally focused. Policies may take the form of community or church rules or regulations that define appropriate or inappropriate health behaviors in their respective settings (e.g., no smoking on the church property). Systems level interventions refer to making structural or organizational changes that influence the culture of behavior within a system (e.g., candy machines are banned in the hospital). Environmental interventions are those which change the natural or built environment to make healthy choices possible and practical (e.g., building parks, bikeways, safe walkways). Policy and structural interventions are often linked to affect changes in the desired setting.

2.2. Examples of PSE interventions

Each of the USAPI jurisdictions applied the PSE approach to tobacco and nutrition interventions. The interventions included healthy beverages only (water and coconut only) at faith based gatherings, no salt products on restaurant tables, providing and encouraging exercise time during work hours at government buildings, providing signage and peer monitoring of no smoking zones at public buildings, and developing business policies to increase the amount and location of fresh local produce in local stores.

In Yap State of the Federated States of Micronesia, the government hospital feeding program implemented a healthy food voucher policy. Patients and their caregivers were issued vouchers to purchase fresh local food and produce from the local stores, instead of being provided canned tuna, canned mackerel, and white rice bought from the local stores.

A systems change can be seen in the Republic of Palau when the Ministry of Education provided healthy school lunches for all their public school students.

An environmental change is evident through the poker rooms' compliance to the smoke-free air law on the island of Saipan in the Commonwealth of the Northern Mariana Islands.

2.3. Process and intermediate outcome evaluation

The evaluation for PSE interventions in these jurisdictions aimed to expand the evidence for the effective interventions, such as increased access to healthy beverages at churches and compliance in smoke-free environments. The horizon for PSE interventions and evaluation was two years (2014–2016).

The primary outcomes of interest were: a) whether the respective PSE interventions influenced the desired health behavior change; b) actual use, which is defined by the CDC as the number of people who use an enhanced environment or system to support improved health as intended. [26] Actual use was determined by the number of individuals

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