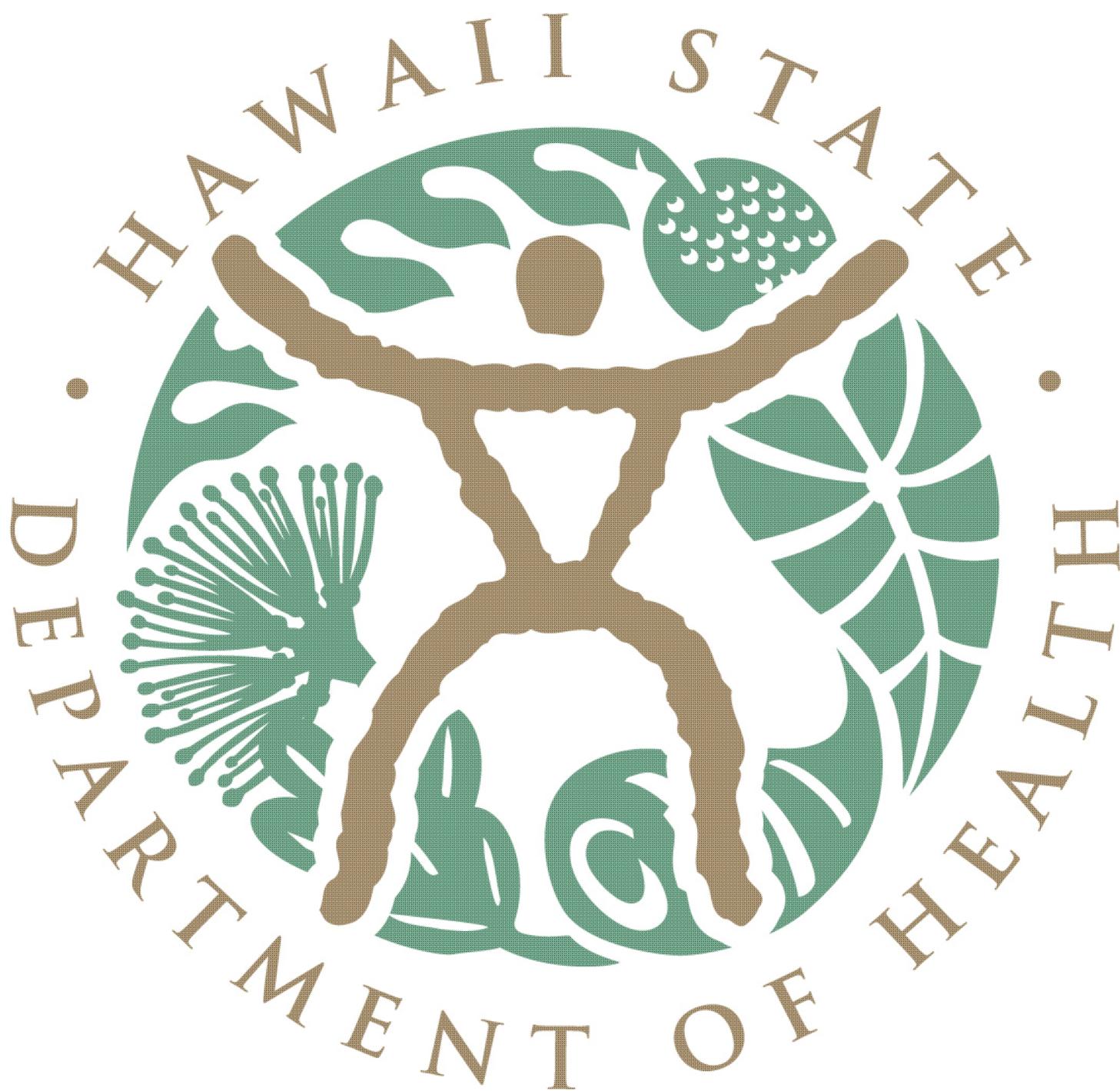
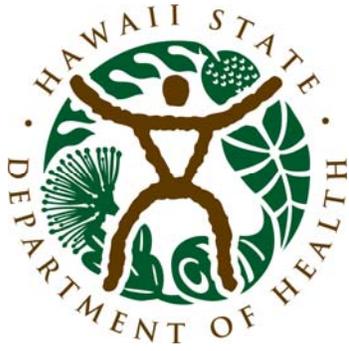


# Hawaii Journal of Public Health





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# A Multi-Level Interactional Analysis of the Impact of Macro-Structural Forces & Micro-Situational Events on Health Outcomes for Racialized Groups

Ingrid Waldron

## Abstract

**Objective:** This conceptual paper addresses the failure of studies on health disparities and outcomes in Canada, the US and Britain to examine health as an outcome of multiple structural, institutional and everyday forces and events. It offers an analytical approach for examining health disparities and health outcomes for racialized groups as products of *both* macro-structural forces (structural and institutional inequalities and discrimination) and micro-situational events (everyday inequalities and discrimination).

**Methods:** This theoretical and conceptual paper presents an analytical approach for understanding the interactional relationship between macro-structural inequality and micro-situational discriminatory events by reviewing and critiquing independent analyses on these issues in the existing literature.

**Results:** In reviewing existing studies on the social determinants of health, health outcomes and health disparities, the author found that the focus on *either* macro-structural inequalities *or* micro-situational inequities is limited in its understanding of the complex ways in which discrimination impacts on health. Consequently, the author of this paper proposes an interactional analytical approach as a corrective to these analyses.

**Conclusions:** The paper concludes by arguing that decreasing health disparities and increasing health access for racialized groups require a multi-pronged approach that acknowledges how health outcomes and disparities result from the interactional relationship between macro-structural forces and micro-situational events. This approach must also address the social, health, educational, economic, political and environmental inequalities that exist in modern-day societies.

**Implications:** This paper offers suggestions for how healthcare services and policies could better reflect and address the challenges and barriers experienced by racialized clients. Some of these suggestions include making race and racism central in the delivery of services and treatment and acknowledging the diverse health belief systems of culturally and racially diverse groups.

**Keywords:** Inequality; Discrimination; Health; Macro-Structural Forces; Micro-Situational Events; Race

## **Impact of Discrimination on Health Outcomes & Disparities**

In Canada, the US and Britain, racialized, immigrant and refugee groups are most at risk for experiencing the negative health effects that result from persistent health disparities because race, socio-economic status, poverty, citizenship status and other social determinants expose them to macro-structural and micro-situational inequalities that produce poor health outcomes. Several studies show that the main determinants of health are not rooted in medical or behavioral factors, but, rather, in a host of social and economic barriers (1, 41). This paper uses a “social determinants of health” approach to examine how inequality and discrimination shape health outcomes and produce health disparities between more and less advantaged groups. A “social determinants of health” approach is useful for pinpointing the social, environmental, economic, and political factors that compromise the health status and well being of marginalized groups, communities and jurisdictions. Raphael (40) identifies the following main social determinants of health: 1) health status and health services; 2) early life; 3) education; 4) employment and working conditions; 5) food security; 6) income and income distribution; 7) social exclusion; 8) social safety net; 9) unemployment; 10) employment insecurity; and 11) poor quality housing.

A report by Access Alliance Multicultural Community Health Center (1) identifies the following social determinants as compromising health and well-being: 1) lack of

access to services and transportation; 2) lack of formal or informal child care; 3) exposure to violence; 4) criminalization and 5) racial profiling; 6) educational streaming; 7) racial/cultural stereotyping; 8) unequal access to information; and 9) concentration in racially segregated neighbourhoods. Several studies (1, 48) also traced some of the most common health and mental health problems to structural inequalities. These health and mental health problems include anxiety; alcoholism; drug dependency; depression; suicide; and homicides.

Discrimination is one of the most important health and mental health issues affecting the lives of racialized groups. It occurs when ideologies of superiority and inferiority are put into practice in ways that exclude perceived inferior groups from accessing resources and participating in the social, economic and political processes in any given society. When we look at its implications for health, we find that discrimination often produces the psycho-social stressors that lead to health problems and is a major barrier to access or utilization of health services. The significant barriers that racialized communities face in accessing appropriate health services are often due to systemic discrimination. Discriminatory practices are key factors -- perhaps the most important ones -- in producing health disparities and poor health outcomes for racialized groups, in determining the place where members of these groups receive diagnosis and treatment and

in determining the quality of clinical services. Several studies (13, 25, 28) found that racial discrimination, in particular, is a significant determinant of health for Canadian immigrants because it determines socio-economic mobility and access to institutional resources, including health services.

It is also important to consider how gender intersects with race to expose racialized women to a host of health and mental health problems. An understanding of health and illness for racialized women must acknowledge their history as a racialized group (slavery, genocide, relocation), the existence of gender inequalities that accord them secondary status in the social, legal, economic and political institutions of society (e.g. discrimination in employment, housing and society; unequal protection under the law) and their complex relationships to their own communities that simultaneously buffer them from the hard edge of discrimination and subjects them to lingering internal problems due to a legacy of oppression that is inherent to racialized communities. Thomas Barnard (45) found that for Black Nova Scotian women, the cumulative effect of systemic racism in their lives puts them at an increased risk for a host of chronic diseases and other health and mental health problems, including depression and suicide; fear; mistrust; despair; alienation; loss of control; damaged self-esteem; drug and alcohol abuse; violence; high stress and stress related diseases; short lifespan; poor pediatric care; hypertension;

cardiovascular disease; high blood pressure; stroke; psychological stress; diabetes; breast cancer; and lupus.

#### Cultural Normativity of Whiteness: Implications for Health

A discussion on discrimination, and racism specifically would not be complete without an acknowledgement of how white privilege and the hegemonic character of Euro-Western thought come to be enmeshed within the process and practices of modern-day institutions and manifested in the everyday mistreatment of racialized individuals. Moreover, an analysis on race as a pre-determining factor for poor health outcomes and disparities lends itself to a focus on the ways that white domination as a historical process and as a social and ideological construct gets configured and re-configured with each generation as central within discursive and institutional spaces. Whiteness as a culturally normative space is manifested within health services and plays a role in producing and reproducing health disparities and poor health outcomes for non-white groups. It can be argued that the cultural normativity of whiteness accords white privilege and Euro-Western thought a kind of invisibility because they are exercised from a hidden and unmarked space that allows for their ongoing re-generation within the social structures, institutional practices and ideologies. In this way, whiteness extends beyond mere skin colour to the discursive spaces and practices that sustain the

privilege, power and dominance of Euro-Western thought within a variety of social institutions, including health. This “cultural embeddedness of whiteness” within discursive spaces and practices means that the dominance of Euro-Western thought remains unconscious,, standard, universal, “common-sense” and consequently, the yardstick with which non-white groups are judged. The “common-sense” knowledge in every society includes those ideologies, beliefs, and traditions that constitute the moral fabric of that society. In Euro-Western and non-Euro-Western societies, this “common-sense” knowledge is often considered to be those ideologies, traditions, practices that emanate from a Euro-Western frame of reference predicated on European cultural traditions, ideologies, and values. Ideologies, traditions and practices often become “common-sense” when they are presented and perceived by dominant and marginalized groups as natural, obvious, and normal.

It is the unquestioning of so-called “common-sense” knowledge within healthcare that is of concern in this paper, particularly with respect to how health disparities and outcomes can be traced directly to structural, institutional and everyday inequalities that are premised on race-based privileges and disadvantages. Interrogating the hegemonic and imperial character of Euro-Western thought within medical knowledge is important if we are to understand the health disadvantages experienced by racialized groups. Assessments, diagnoses and treatment within health services are

shaped, for the most part, by Euro-Western health belief systems that are often at odds with the health beliefs of culturally and racially diverse groups. Conceptualizations of illness and health are rooted in the “common-sense” knowledge of the society in which they operate because the actions, beliefs and motives that provide the basis for understanding al illness are conceptualized in unique ways depending on the society. When the health system presents Euro-Western health approaches as standard and universal, the consequence is the denunciation, devaluation and marginalization of the cultural belief systems and traditions that shape the health ideologies of culturally and racially diverse groups. Consequently, racially and culturally diverse groups are often less satisfied with the quality of care they receive or hesitant to access health services, which may result in under-diagnoses of illness, lack of health care and poor health outcomes.

### **Analyses of Inequality: Macro & Micro Level Interactions**

This paper argues that a truly critical analysis of health disparities between more and less advantaged groups in society is one that acknowledges differences in health outcomes and access to health services as a product of the convergence of macro-structural inequalities *and* the micro-situational inequities. It offers a multi-level analysis of discrimination by drawing connections between micro-situational analyses of everyday

inequities and macro-structural analyses of inequality.

A macro-analysis of inequality examines inequality as a product of historical and present-day processes and practices that are embedded and couched within social structures, permeate the institutions of modern-day society and that limit opportunities and access to social, economic and political resources. It is important here to acknowledge the subtle distinctions between structural and institutional inequality. Structural inequality refers to the cumulative and persistent inequalities that operate through the laws, norms and rules of governance in every society. It is an outcome of the interactive operationalization of historical discriminatory practices, individual discriminatory actions and unequal institutional policies and processes. For example, the denial of home ownership to racialized people in the United States, as well as the existence of racially segregated neighbourhoods today in that country can be traced to the National Housing Act of 1934, which subsidized home mortgages for whites and created racially homogeneous and unequal neighbourhoods. Institutional inequality, on the other hand, is manifested and embedded in the processes, practices and policies within institutions that refer to ideologies about race, gender, sexual orientation and other social dimensions in order to accord privileges to certain groups and subject other groups to disadvantages. For example, hiring practices that use race-based

ideologies to deny racialized individuals access to jobs and promotion are examples of embedded institutional inequality.

A micro-analysis of inequality, on the other hand, examines inequality as a product of intentional or unintentional practices committed by individual persons acting alone and is concerned with the everyday injustices and incidents of unfair treatment that occur in interpersonal relationships and daily interactions between individuals. It expresses itself in gestures, behaviours, glances, forms of speech and physical movements that are not always consciously experienced by its perpetrators, but that are experienced in negative ways by its victims. Several studies (38, 43) use the term “micro-aggressions” to refer to both overt and covert forms of everyday racism that exist in everyday interactions and arise out of unconscious attitudes held by Whites which hold Black people and other racialized groups in little regard. They include verbal or nonverbal insults that are automatically or unconsciously directed toward racialized individuals and which often result in diminished mortality and decreased confidence and self-esteem for victims. These researchers argue that these ideologies and interactions are created, actualized, reinforced and sustained through the continual socialization and learning of racism.

Similarly, Feagin and Eckberg (18) use the term “isolate discrimination” to refer to individual acts of everyday discriminatory behavior, but,

although they state that these behaviours are committed by one dominant group member against a subordinate group member, they perceive everyday acts of discrimination as independent of institutional processes, an approach that is at odds with the arguments made in this paper. The failure to acknowledge experiences of discrimination as a product of the interactional relationship between everyday practices (micro-situational perspective) and structural and institutional processes and practices (macro-structural perspective) obscures and negates how macro-structural forces provide the context for everyday injustices to play out and be reproduced across generations. Moreover, it is difficult to argue, as Feagin and Eckberg did, that everyday acts of discrimination play out independent of institutional processes when the injustices experienced by racialized groups within the social institutions of society (education, health, employment etc.) can be traced to the everyday acts of injustice and unfair treatment committed by dominant groups against racialized groups that exclude them from accessing resources and opportunities. For example, when an employer makes a decision after an interview to not hire a job applicant because of race, culture or religion, she or he commits this everyday act of injustice within the institution in which he is located (employment) and plays a role in the reproduction of discriminatory employment ideologies, processes and practices that, ultimately, becomes embedded and justified within that institution.

In a later study, Feagin (17) seemed to acknowledge the interactional relationship between the macro and micro:

The micro-level events of public accommodations and public streets are not just rare and isolated encounters by individuals; they are recurring events reflecting an invasion of the micro-world by the macro-world of historical racial subordination (p. 115).

Likewise, Essed (16) argues for an understanding of discrimination that articulates the convergence between macro-structural forces and micro-situational events by defining everyday racism in the following way:

[A process that] is routinely created and reinforced through everyday practices [and] connects the structural forces of racism with routine situations in everyday life. It links ideological dimensions of with daily attitudes and interprets the reproduction of racism in terms of the experience of it in everyday life. (p. 2).

Although neither Feagin (17) nor Essed (16) focus specifically on the impact of discrimination on health, this paper draws on their arguments to examine health of racialized groups as an outcome of multiple levels of inequality. Despite an increasing interest in multi-level analyses, few researchers have examined the simultaneous and

interactional effects of macro-structural forces of inequality (structural and institutional discrimination) and micro-situational inequities (everyday discrimination). This paper addresses these limitations by arguing for an analysis that characterizes inequality in its circuitous, contextual, and multidimensional form and by examining health outcomes and disparities as the product of the convergence between the macro-structural forces of discrimination that often occur within societal institutions and structures and the micro-situational discriminatory events that occur between individuals in everyday life.

### **An Interactional Analysis for Understanding Health Disparities & Health Outcomes for Racialized Groups**

#### Independent Analyses of Macro-Structural Forces and Micro-Situational Events

The influence of macro-structural forces and micro-situational events on health outcomes and disparities between various racial groups are issues that have largely been analyzed independently in the literature. Many studies have largely failed to examine how poor health among racialized groups and health disparities between dominant and subordinate groups result from the convergence of structural, institutional and everyday inequalities and inequities. For example, Williams (49) focuses mainly on macro-structural forces in

his examination of the influence of race and socioeconomic status on health outcomes. He argues that racial disparities in health are caused by disparities in socioeconomic status and that racial disparities in health persist even when people of diverse races are of similar socioeconomic status. Williams suggests that socioeconomic status is part of the causal pathway through which race impacts health. He identifies the multiple ways in which racism affects health, including: 1) residence in poor neighbourhoods; 2) racial bias in medical care; 3) stress resulting from experiences of discrimination; and 4) the acceptance of the societal stigma of inferiority. Macro-structural forces are also identified as the source of disparities in rates of mental illness between whites and Blacks in several British studies. These studies (11, 36) attribute higher rates of psychotic illness for African Caribbean people than indigenous Whites in Britain to adverse environmental factors, such as racism and discrimination in housing, employment, social and health care and the legal system. Other studies (22, 27) found that rates for psychotic illness are not similarly raised in the Caribbean, where racism is not as salient an issue as it is in white-dominant societies. In fact, the study by Gilvarry et al. (22) found that second-generation African Caribbean people (born in the UK) experience higher rates of psychosis than their Caribbean-born counterparts, suggesting that mental health is negatively impacted by structural, systemic and institutional

injustices experienced by racialized peoples in white-dominant societies.

Various studies (4, 24, 29, 51) on the “healthy immigrant” effect also provide evidence for the negative health effects of structural and institutional inequalities experienced by immigrant and refugee groups. These studies show that the health advantage that recently arrived immigrants and refugee groups experience compared to longer-term residents and Canadian-born people gradually erodes over successive generations. This “healthy immigrant” effect highlights the role that various social determinants (marginalization, social inequality and discrimination, the migrant experience and poverty) play in putting immigrants and refugee groups at risk for developing chronic diseases and other health problems over several generations. Other studies (21, 24, 26) also point to structural and institutional factors as health determinants for Canadian immigrants, including age, length of residence in Canada, self-selection in the immigration process and the socio-economic factors (educational and occupational opportunities).

Similar to studies conducted on the health impact of macro-structural forces, studies on the health impact of micro-situational discriminatory events obscure and negate the interactional relationship between everyday discrimination and structural and institutional discrimination. For example, Karlsen and Nazroo (30) examine race-based physical and verbal abuse and vandalism as forms of everyday

acts of discrimination impacting on health by focusing on how violence and vandalism impact on the health of Indian, Pakistani, Chinese, and Caribbean groups in Britain. They found that participants who were victims of racially motivated physical attacks and vandalism were 100% more likely to report fair or poor health than respondents who were not victims of such attacks. Respondents who were victims of racist verbal abuse were 50% more likely than those who were not victims to describe their health as fair or poor. Finally, respondents who experienced verbal abuse had an 85% increased risk of developing respiratory illness and a 150% increased risk of developing psychosis and depression than those who were not victims of verbal abuse.

Deitch et al. (15) report on three studies that used secondary data from three different samples of Black and white respondents to examine the occurrence of everyday mistreatment in the workplace, as well as its impact on health and well-being. Study 1 looked at the experience of everyday mistreatment of Blacks in a civilian sample, as well as the impact on job-specific well-being. Studies 2 & 3 use military samples in order to constructively replicate the findings of Study 1, by using a different measure of everyday racism and broader set of outcome variables including measures of context-free well being. The findings from Study 1 indicate that the indirect effect of race on job satisfaction through mistreatment was significant, with Blacks

experiencing lower job satisfaction. Race was significantly related to mistreatment, particularly among Blacks who reported significantly more mistreatment on the job. Studies 2 & 3 comprised of samples of respondents from the United States Navy and the United States Army, respectively and, similar to Study 1, the results show that race was significantly associated with mistreatment and that the consequences for job satisfaction of those victimized is statistically significant. Results also showed that mistreatment was strongly negatively related to emotional well-being and that Blacks reported significantly worse physical well-being due to on the job than Whites. Studies have emerged in recent years that attempt to address the limitations of these and other studies that obscure and negate the interactional relationship between macro-structural forces and micro-situational events. However, it is important to point out that while these studies have sought to examine the links between these constructs, they have largely failed to articulate their interactional relationship.

#### Making the Connection: Linking Macro-Structural Forces and Micro-Situational Events in the Literature

Although a few studies (31, 44) examining health disparities and negative health outcomes for racialized groups as a product of both macro-structural forces and micro-situational discriminatory events are emerging gradually, their

presentation of these issues as separate and independent phenomena impinging on health fails to articulate their *interactional* relationship. For example, a study conducted by Karlsen, Nazroo, McKenzie, Bhui, & Weich (31) on the relationship between race, ethnicity, gender, age and socio-economic status and common mental disorders (CMD) and psychosis for Caribbean, Indian, Bangladeshi, Pakistani and Irish people in England found that there was an increased risk of CMD and psychosis due to racially motivated verbal abuse or physical assault in the combined gender and ethnic minority group multivariate models. The study also found that the experience of overt, everyday discrimination (verbal abuse, physical assault) and institutional and systemic discrimination (workplace discrimination, perception of racism in British society) are independently associated with CMD and psychosis.

Schulz, Williams, Israel, Becker, Parker, James & Jackson (44) examine the cumulative effects of multiple stressors on women's health, by race and area of residence by focusing on the cumulative effects of socioeconomic status, experiences of unfair treatment and acute life events by race and residential location on the health status of African American and White women living within the city of Detroit and in the surrounding metropolitan area. The authors found that African American women (regardless of whether they live inside or outside the city) report more frequent experiences with

everyday unfair treatment than White women. They also found that African American women residing in the city reported a greater number of acute life events than White women residing outside the city. African Americans are also more likely to experience stressful conditions and are more negatively affected by these stressors than higher status groups. Schulz et al. also found that, overall, African American women reported less favourable general health status than did White women and that African American women, regardless of where they lived, reported significantly poorer health status than White women living outside the city limits. In general, the results show that the relationship between race and general health status is partly accounted for by disparities in unfair treatment and life events.

The failure of existing studies (5, 7, 8, 14, 37) to specify whether discrimination is rooted in structural, systemic and institutional forces and/or everyday occurrences leaves untouched the multilayered and multi-level ways in which negative health outcomes and disparities manifest. For example, while the finding by the American College of Physicians (5) that African Americans were 50% less likely than White Americans to have an angioplasty and coronary bypass surgery (despite the fact that the mortality rate for heart disease among African Americans was about 50% higher) suggests that there are racial disparities in treatment, it fails to specify whether these disparities result from differential treatment that

are systemic to health institutions and that privilege the health concerns of non-racialized and other advantaged groups or/and everyday actions and practices by health professionals that exclude African Americans from life-saving surgery. Similarly, while other studies (7, 8, 14, 37) show that lower health status and higher mortality rates among “minorities” are due to disparities in care, they fail to reveal whether these disparities are due to institutional or everyday inequalities in health care or both.

Important gains are being made, however, in the investigation of the interactional effects of institutional inequalities and everyday inequities. A study conducted by Noh, Kaspar & Wickrama (35) is notable because it is one of few studies that offer a framework for future research on the interactional effects of macro-structural inequalities and micro-situational inequities. In this study, the authors argue that both overt (everyday) and subtle (structural; institutional) discrimination in Canada impact mental health through different intra-individual processes. They found that overt discrimination resulted in an erosion of positive affect, independent of emotional or cognitive mediators and that subtle bias resulted in more complex emotional and cognitive appraisal of experiences that produce distress. The authors’ attempts to distinguish between the specific experiences of subtle discrimination and overt discrimination on mental health are promising and speak to a need to examine the multiple levels at which health is negatively impacted.

### A Multi-Level Interactional Analysis

In proposing a Multi-Level Interactional Analysis for understanding the determinants of health, this paper recognizes that health disparities and poor health outcomes for racialized groups are produced from the interaction between structural and institutional inequalities and discrimination (macro-structural forces) that limit opportunities and restrict access to resources for racialized groups *and* the everyday forms of mistreatment that victimize racialized individuals (micro-situational events). In other words, an interactional analytical approach understands that neither discriminatory macro-structural forces nor micro-situational discriminatory events operate independently to produce poor health outcomes and disparities. Rather, they operate *together* and interdependently to determine health outcomes, health disparities, access to and utilization of health services and quality of care with respect to clinical assessments, diagnoses, treatment and follow-up care.

An interactional analysis for understanding health outcomes and disparities characterizes health disparities and outcomes for racialized groups in five main ways: 1) inclusive; 2) interdependent; 3) multi-level; 4) multi-directional; and 5) contextual. It is inclusive because it acknowledges the multiple social factors that determine health outcomes and disparities, such as race, culture, gender, sexual orientation, disability, language and citizenship status. It is

interdependent because it understands health as a product of the intersections of multiple social factors (race, gender, social class etc) operating interdependently and simultaneously. It is multi-level because it recognizes that health is impacted at both the macro (historical, structural, institutional) and micro levels (everyday). In other words, a macro perspective is concerned with the structural and institutional policies, systems and processes that limit opportunities and deny access to resources for racialized and other marginalized groups. A micro perspective, on the other hand, focuses on everyday and individual practices and mistreatment that victimize racialized groups. An interactional analysis also demonstrates the multi-directional character of discrimination and its impact on health because it acknowledges how structural and institutional forms of discrimination produce and are produced by one another. Similarly, everyday discrimination produces and is produced by structural and institutional discrimination. This characterization speaks to the circuituous nature of discrimination and suggests a kind of ongoing re-fueling of discrimination that allows for its production, generation and re-generation. Finally, an interactional analysis understands the contextual nature of health because it recognizes that the determinants of health will be constituted and manifested differently within and across multiple spatial, geographical, temporal and socio-cultural contexts.

Initiatives geared towards reducing and eliminating health disparities and poor health outcomes for racialized groups must acknowledge how these factors are implicated in decisions to access health services, healthcare treatment meted out to racialized groups, follow-up care and health outcomes for these groups.

### **The Role of Discrimination in Healthcare Access & Utilization & Quality of Care: Macro-Structural & Micro-Situational Implications**

Health disparities between more and less-advantaged groups are often attributed to the racial, socio-economic and other inequalities that impact negatively on health, deter or prevent individuals from accessing health services and that result in the mistreatment of racialized groups by health professionals. While many patients may be unaware of the often subtle and seemingly benign institutional processes within healthcare that jeopardize their health, they are often acutely aware of how ideologies about race, socio-economic status, gender, religion, sexual orientation, language, disability and other social identities influence the treatment they receive from healthcare professionals which are often expressed as misunderstandings, insensitivity, bias, disrespect and discrimination. It is also important to point out that mistreatment is also manifested in clinical care, including diagnosis, treatment and follow-up care.

#### Access to & Utilization of Health Services

Several studies document that race, ethnicity, gender, education level, immigrant status and income level act as barriers to health services and health services utilization. Studies conducted by Across Boundaries (2) in Canada and Bojuwoye (12) in the US suggest that many racialized individuals don't access health services because they are wary of receiving services that operate within a Euro-Western framework and they perceive as culturally at odds with their values, traditions and practices. Canadian studies that examine access to health services by South Asian women (3), Hispanic women (6), Tamil and Chinese seniors (42) and West Indians (47) found that lower access to healthcare by these groups may also be attributed to physicians' propensity to prescribe drugs, desire for treatment and care that was premised on more holistic approaches, negative past experiences with health services, language barriers, and healthcare that was at odds with cultural beliefs and traditions and racism.

Fenta, Hyman and Noh (19) argue, however, that there are inconsistencies in the research on the extent to which immigrants utilize healthcare services, with several studies showing that immigrants under-utilize health services compared to Canadian-born residents and other studies indicating that they use these services more than the Canadian-born population. Various explanations have been offered for the under utilization of health services by immigrants, such as language barriers, cultural distance

between health providers and clients, unfamiliarity with the health system and racism. Fenta et al. (19) found that 85% of study participants used at least one type of health service and that a family physician was most frequently used. Few of these participants (12.5%) attended formal health services for mental disorders, but when they did, they were most likely to see their family physicians. The study also found that females were more likely than males to seek out health services from “mainstream” healthcare providers, particularly family physicians and hospital inpatient services.

Other Canadian studies (20, 23, 39) found that differences in the rates of health services utilization can be attributed to a number of factors, including the number of years that immigrants have been resident in the new country, ethnicity and the type of health service (e.g., preventive, GP, hospital). These studies contend, however, that it is not clear if differences in rates are due to barriers accessing service, lack of awareness about available services, a health advantage that immigrants have upon arrival to a new country or all of these factors.

### Quality of Care

Several studies in the US show that racialized groups are less satisfied than non-racialized groups with the healthcare they receive because they perceive it as lower in quality. Compared to White Americans, African Americans have been found to be less satisfied with hospital care (50) and primary care (10). Another

study (34) found that Asian-Americans were more dissatisfied with care than Whites because of negative interactions with health care professionals, who they reported did not listen to them, spent little time with them and who failed to sufficiently include them in decisions about their health care. A study by McKenzie and Bhui (32) provide strong evidence for discriminatory treatment based on race and ethnicity in the health care system in Britain. The study found that, regardless of socio-economic status and diagnostic differences, psychotherapy is less likely to be offered to Black and ethnic minority groups and that more controlling treatment approaches are used for Black and ethnic minority groups, including drugs and various other forms of coercion. A study conducted in the US by Napoles-Springer, Santoyo, Houston, Perez-Stable & Stewart (33) found that dissatisfaction is typically attributed to lack of sensitivity to and respect for cultural values and traditions, stereotypes, language barriers and health professionals’ reluctance to use complementary and/or alternative health approaches.

The reluctance or refusal of healthcare professionals to use complementary and/or alternative health approaches is one of the main reasons why culturally and racially diverse groups are often hesitant to access health services. One of the main tensions between Euro-Western medical approaches and those premised on the indigenous and culturally-specific ideologies and practices of culturally and racially

diverse groups is that the former is premised on scientific approaches that, for the most part, perceive the mind and body as separate, while the latter is rooted in more holistic ideologies that conceptualize health as an outcome of physical, mental, emotional and spiritual imbalances. For example, a study conducted by Berthold et al. (9) found that Asian Americans, particularly Asian American immigrants, may be more likely to use complementary medicine for mental health problems if they perceive mental illness as originating from underlying physical problems, metaphysical imbalances or offenses committed against spirits or deities. They also found that more than a third of adults in the US use some form of complementary and alternative medicine found outside the confines of the conventional, Euro-Western health system.

Waldron (46) found that many African Canadian women often heal their mental health problems by combining Western psychiatric approaches with the more traditional practices that are indigenous to their cultures. This includes one or more of any combination of psychiatry, psychoanalysis, a family doctor, meditation, yoga, herbal remedies, solitude, diet regulation, relaxation, social support networks, divination, spirituality and prayers. These women's choice of treatment is determined by their personal beliefs about how "mental illness" is manifested. If they are struggling with relationship problems, their response is typically medical and they will go to a family doctor or

psychiatrist. If they believe the cause to be spiritual, however, they may go to an indigenous healer or engage in prayer or meditation.

Improving access to quality healthcare services for racialized groups requires the involvement of all levels of the healthcare system, including from the health services administrators, health professionals and key policymakers. It also requires that these individuals take seriously the significance of race, racism and other differences in producing health disparities and poor health outcomes for racialized groups. While the health system has been keen, to some extent, to look at how cultural differences create barriers to healthcare, they have been less willing to acknowledge how race, racism and white privilege in society and within healthcare disadvantage, exclude and oppress racialized groups.

### **Improving Access to Health Services for Racialized Groups: Challenges & Opportunities**

Decreasing health disparities and increasing health access for racialized groups require a multi-pronged approach that acknowledges how health outcomes and disparities result from the interactional relationship between macro-structural forces and micro-situational events. This approach must also address the social, health, educational, economic, political and environmental inequalities that exist

in modern-day societies. While it is beyond the scope of the health system to eliminate all of the social, economic and political inequalities that exist in society, it can play a role in helping racialized clients cope with the contradictions, tensions and challenges of living in an unequal society. This section urges scholars, health professionals and policymakers working in the area of health equity to reconsider how equitable health outcomes and equitable relations within health care agencies can be produced through a more critical analysis of inequality that acknowledges its multi-level, multi-layered and multi-textured character.

Increasing access to health services for racialized groups requires that health policy, health services and health care professionals work together to identify how ideological representations of race and other differences manifest in the systems, processes, practices and policies of the healthcare system and in the everyday interactions between health professionals and clients. In doing so, it is critical that they question how bias, exclusion and discrimination become embedded and reproduced through unquestioned and “common-sense” ideologies and practices that are premised on Euro-Western values and traditions. Too often, the focus is on changing the values, traditions and health behaviours of culturally and racially diverse individuals rather than on addressing the policies, processes, systems and practices that need to be modified within healthcare services. Questioning the taken-for-granted and “common-

sense” assumptions that are inherent to the health system should involve a consideration of how the infrastructure and physical environment of the clinical setting may be insensitive, intimidating and demeaning to racialized and other marginalized groups. In addition, health services that fail to provide appropriate physical access to individuals with disabilities in the form of parking spaces and walkways not only prevent these individuals from accessing services, they also send a message about the perceived value of these individuals. There are several issues that must be addressed by health policy and services before vulnerable groups, and racialized groups in particular, can be provided with equitable care. First, it is crucial that issues of race and racism be front and center when dealing with the health issues facing these groups. The visibility of race in White dominant societies and, as a result, the powerful currency that race and racial hierarchies hold in these societies suggests that racism is one of the more salient issue facing racialized peoples. Moreover, race offers an intellectual, ideological, and political entry point from which to challenge the hegemonic nature of Euro-Western knowledge and values within health. However, while it is important that race be accorded a certain saliency in discussions on health disparities and outcomes, there must be an appreciation for how multiple oppressions operate in the lives of racialized peoples, including culture, gender, sexual orientation, citizenship status, language, age and disability.

Health policy and services must also acknowledge discrimination and racism as valid social determinants of health. While studies by Raphael (40) and others have played an important role in bringing attention to the multiple social, economic and environmental factors that impact negatively on health, their analyses lack a forceful and uncompromising argument on the significance of race in producing poor health and mental health outcomes for racialized groups in Canada and in shaping ideologies within healthcare services that often serve to negate, undermine, exclude and belittle racialized clients. Analyses that rely on a “social determinants of health” approach for articulating health disparities and outcomes for racialized groups are inherently oppositional to traditional discourse because they challenge the “medicalization of illness” in academic scholarship and health policies and practices. While Western medical discourse, for the most part, is premised on scientific ideologies and methods, a “social determinants of health” approach recognizes the multiple systems, processes and phenomena that are external to the individual and that impact health and produce health disparities. Although this approach does not deny that illness may originate within the body independent of external forces, it embraces the notion that illness is a product of multiple, interdependent and multi-layered factors, many of which result from historical and present-day inequalities that are couched within the structures, systems and institutions of society.

As such health policies that are directed towards the development of health services that provide more practical therapeutic approaches (talk therapy, peer support, assisting client in coping with everyday life challenges in employment, housing etc) may be better able to respond to the everyday lived realities of vulnerable populations.

Health policy and services must also increasingly attend to and validate the multiple ways that racialized individuals seek help for and cope with health and mental health problems, many of which may be at odds with Euro-Western medical approaches. These include religion and spirituality; health practices that are indigenous to specific cultures; and complementary medicine that integrates alternative approaches and Western medical approaches. Recognizing and validating these approaches may involve opening up opportunities for the integration and synthesis between Western and alternative approaches in medical scholarship and professional practice and nurturing more collaborative relationships between Western and alternative health professionals.

Initiatives must also be developed and implemented to challenge racism and other forms of oppression in the health and mental health systems, particularly with respect to assessments diagnoses, treatment and follow up care. While it is crucial that members of non-racialized groups be at the forefront of these initiatives, it is also important that the hiring of health professionals begin to more closely

reflect the makeup of the wider society with respect to race, culture, language, sexual orientation, disability and other identities. Once hired, all health professionals should be required to attend ongoing training that educates them explicitly on how race, racism and other forms of oppression are implicated in the lives of clients and in poor health outcomes. In other words, it is important that racism and discrimination be incorporated into the language of illness within healthcare.

It is also crucial that health services develop multi-sectoral partnerships with settlement agencies, social service agencies, community agencies, shelters and other community agencies to assist individuals in coping with the multiple social, economic and environmental determinants that jeopardize health, such as poor housing, segregated neighbourhoods, unemployment, environmental hazards, and poverty. Unfortunately, since many community-based agencies fail to understand that these social, economic and environmental issues are, in fact, health issues, they lack an awareness of the role that they can play in improving health outcomes for racialized groups.

Finally, it is important that inter-professional relationships be forged between physicians, psychiatrists, social workers, settlement workers and other community professionals to provide services in non-clinical settings, such as shelters, social service agencies and other community-based agencies. These

types of professional relationships not only help to sanction ways of sharing different skills at different levels to help clients at different points in their lives, but they also offer more opportunities for professionals to support one another in providing health care to clients outside the “mainstream” healthcare system, particularly since these clients are often hesitant to access these services.

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## **Tobacco Use in the Adult Mental Health Population: Opportunities for Positive Change**

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### **Abstract**

This article presents information to stimulate public discussion about tobacco use among adult consumers who live with mental illness. Over time, tobacco use can lead to negative physical and psychiatric health challenges. Adult consumers who live with mental illness should have access to resources that address lifestyle and wellness. Open discussion about the relationship between their tobacco use and improved health is important as we continue to explore this often neglected public health issue on a national and statewide level.

### **Introduction**

Literature on the topic of tobacco use in the adult mental health population identifies a need for a comprehensive, collaborative, multi-agency approach towards reducing prevalence rates of tobacco use and increasing routine communication about options to quit.

Articles related to both physical health and mental health have attempted to explain the prevalence trends, incorporating theory-based and

scientific, research-based discussion by public health and mental health professionals. Implementing tobacco use policies to improve health outcomes continues to be a primary recommendation.

The purpose of this article is to familiarize the reader with published literature on the topic and to increase awareness of the need for positive

change in the delivery of outpatient public adult mental health services relative to consumer tobacco use, both nationally and here in Hawai'i.

A literature review was conducted for a detailed discussion of tobacco use for adults with mental illness.<sup>i</sup>

Achievements in addressing this public health issue are cited from organizations that have successfully implemented tobacco cessation programs. For example, there are tobacco cessation program models designed to compliment the integration of tobacco cessation into a recovery-oriented setting, and toolkits and other consumer-friendly literature.

## **Problem Statement**

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<sup>i</sup> Key words: Tobacco use, nicotine dependence, tobacco dependence, tobacco cessation, adult mental health, mental illness, co-morbidity, addiction treatment, and tobacco policy.

Tobacco use has been linked to an assortment of physical and mental health issues. It is a major public health issue that continues to be addressed nationally at the local, state, and federal levels of government, as well as through the private and philanthropic sectors. There are a variety of tobacco products in the market including cigarettes, cigars, chewing tobacco, snuff, and pipe tobacco, all of which contain nicotine, a highly addictive drug that affects the central nervous system, as well as other chemicals and additives.<sup>1</sup> Over time, tobacco use can cause a range of health issues including cancer, nicotine dependence and other ailments that increase an individual's risk for premature death.

Despite evidence that tobacco use is linked to major health consequences, it continues to be minimized in behavioral

health treatment settings.<sup>2</sup> Barriers to addressing tobacco use in the adult mental health population continue to include disparities traditionally seen in the general population, as well as concern for the potential effects of tobacco use policies. For example, potential effects may include an increase in psychiatric symptoms while participating in a smoking cessation program and a general coercive effect of smoking cessation policies on personal choice. As the leading preventable cause of death, decreasing prevalence of tobacco remains an ongoing multi-disciplinary initiative, one with particular importance for consumers of mental health services.

### **Overview of National Tobacco Use**

Before addressing tobacco use in consumers of mental health services, it is important to have some essential

background. Tobacco use, the majority being cigarette smoking, is linked to approximately 438,000 deaths annually in the United States.<sup>3</sup> In addition to loss of life, health care costs and the loss of productivity are estimated at \$167 billion each year.<sup>3</sup> Tobacco related health issues include, but are not limited to, various cancers, cardiovascular disease, cataracts, respiratory disease, chronic lung disease, chronic obstructive pulmonary disease, cirrhosis, heart disease, leukemia, newborn/child developmental and respiratory problems, complications during pregnancy, and soft tissue lesions.<sup>4,5,6</sup> The Center for Disease Control and Prevention's (CDC) Sustaining State Programs for Tobacco Control in 2006 reported that "for each person who dies from a smoking-related disease, about 20 more are living with a smoking-attributable illness."<sup>4</sup>

Current methods for collecting surveillance data on tobacco use include the Behavioral Risk Factor Surveillance System (BRFSS), Hawaii Health Survey (HHS), National Comorbidity Survey (NCS), National Epidemiologic Survey on Alcohol and related conditions (NESARC), National Health Interview Survey (NHIS), National Household Survey on Drug Abuse (NHSDA), National Survey of Drug Use and Health (NSDUH), Pregnancy Risk Assessment Monitoring System (PRAMS), and the survey on Smoking-Attributable Mortality, Morbidity, and Economic Cost (SAMMEC).

Classification by the CDC of smoking status includes identifying whether an individual falls into one of four smoking status categories.<sup>7</sup> Category I, *Ever*

*Smoker*, is defined as an individual who has smoked at least 100 cigarettes in their lifetime. To determine their smoking status, the CDC recommends asking, "Have you smoked at least 100 cigarettes in your entire life?" Category II, *Current Smoker*, is defined as an individual who has smoked at least 100 cigarettes in their lifetime and currently smokes every day or some days. To verify, the CDC recommends asking, "Do you now smoke cigarettes every day, some days, or not at all?" and further querying individuals who smoke cigarettes every day or some days, "During the past 12 months, have you stopped smoking for more than one day because you were trying to quit smoking?" Category III, *Former Smoker*, is defined as an individual who smoked at least 100 cigarettes during their lifetime but does not currently smoke. Lastly, Category IV, *Never Smoker*, is

defined as an individual who has never smoked 100 cigarettes in their lifetime.

Prevalence rates reported via the 2006 NHIS identified that approximately 20.8% of adults in the United States were current cigarette smokers.<sup>8</sup> A higher prevalence was identified in men (23.9%) than in women (18.0%).<sup>8</sup> By ethnicity, American Indians/Alaska Natives had the highest prevalence at 32.4% followed by African Americans at 23.0%, whites at 21.9%, Hispanics at 15.2%, and Asians (not including Native Hawaiians and other Pacific Islanders) at 10.4%.<sup>8</sup> Looking at prevalence by age, survey results show that 23.9% of cigarette smokers are age 18-24 years, 23.5% are 25-44 years, 21.8% are 45-64 years, and 10.2% are 65 years and older.<sup>8</sup> Adults with a higher education are less likely to smoke cigarettes than adults who have a GED or no high

school diploma.<sup>8</sup> Cigarette smoking is more common among adults who live below the established federal poverty level compared to those living at or above the poverty level.<sup>8</sup>

The goals of the U.S. Department of Health and Human Services (DHHS), Office of Disease Prevention and Health Promotion, Healthy People 2010 initiative is to increase the quality and years of life and to eliminate health disparities.<sup>9</sup> One objective related to tobacco use is to reduce adult tobacco use, specifically cigarette smoking, to no more than 12%.<sup>9</sup> Healthy People 2010 identifies tobacco use as one of the leading health indicators for disease prevention and health promotion.

Another area covered in the Healthy People 2010 initiative is environmental tobacco smoke (ETS). Exposure to ETS

continues to be a community health issue which poses a direct health risk to smokers and to nonsmokers.<sup>9</sup> For example, children who live with adults who use tobacco are at a higher risk for respiratory diseases and other ailments.<sup>9</sup> Employees who are consistently exposed to ETS in the workplace are also placed at a higher risk for physical health issues than those who do not work in places where ETS is consistently present.<sup>9</sup> Reducing tobacco use will have a direct impact on decreasing exposure to ETS and increasing positive health outcomes for smokers and nonsmokers.<sup>9</sup>

### **Tobacco Use in the Adult Mental Health Population**

Co-morbid conditions between tobacco use and mental health are national public health concerns. For the purpose of this article, the terms tobacco use and

mental health will be used consistently throughout this article. According to the Tobacco Cessation Leadership Network, smoking is two to four times greater among individuals who have been diagnosed with a psychiatric or substance use disorders.<sup>10,11</sup> On average, smokers tend to die sooner than non-smokers. Adults with a mental health diagnosis are at a higher risk of death compared to the general population in part due to the higher rate of tobacco use.<sup>10</sup>

A report by the National Association of State Mental Health Program Directors (NASMHPD) Medical Directors Council, highlights the issue of mortality and years of potential life lost.<sup>12</sup> Findings from recent state level studies suggests that adults with a serious mental illness die approximately 25 years earlier than the general population.<sup>12</sup> Death rates

were attributed to the leading causes of death, combined with living with a serious mental illness.<sup>12</sup> Alcohol abuse, major depressive disorder, anxiety disorder, substance abuse, bipolar disorder, schizophrenia, and panic disorder are among the most common mental health diagnoses associated with tobacco use.<sup>10, 13</sup>

Literature on co-morbidity between tobacco use and psychiatric disorders identifies that the approximate rate of tobacco use is 40% to 85% for adults diagnosed with schizophrenia, major depression, bipolar disorder, and other serious mental illnesses.<sup>14</sup> Results of the NESARC identified that current smokers with a co-morbid psychiatric diagnosis made up approximately 7% of the population and consumed over 34% of all cigarettes smoked in the United States.<sup>15</sup> It is anticipated that as the rate

of tobacco use decreases among the general population, the stigma surrounding tobacco use and the stigma of having a mental illness will likely increase, and may become a factor in a person's recovery.<sup>16</sup> This dual stigma can potentially affect an individual's ability to maintain employment, housing, and positive social relationships.<sup>16</sup>

Healthy People 2010 identified mental health as one of the leading health indicators for disease prevention and health promotion. The goal of this leading health indicator is to "improve mental health and ensure access to appropriate quality mental health services."<sup>9</sup> The mental health population continues to see growth as the adult mental health population ages and as more people become aware of their mental health status.

Reasons for quitting tobacco vary and are dependent on many factors, including state of readiness, availability of cessation and support services and situational/environmental factors. Based on studies of tobacco quit rates, adults who smoke cigarettes and have a mental illness quit at a rate of 27% to 34% compared to a rate of 43% for adults who smoke cigarettes but do not have a diagnosed mental illness.<sup>14</sup>

From a staff perspective, mental health workers are at a high risk for tobacco use and ETS, tobacco toxins increasing their health risks.<sup>17</sup> Behavioral health care providers, including care coordinators, social workers, counselors and mental health workers are constantly exposed to tobacco use by their clients. Workers identify ETS as burdensome and not supportive of their personal health goals.<sup>17</sup> Workers who

currently smoke identify that it is a challenge to quit smoking due to the work environment and due to the high rates of clients who smoke.<sup>17</sup>

### **Concerns for Addressing Tobacco Use in the Adult Mental Health Population**

Some individuals believe that addressing tobacco use in the adult mental health population can result in doing more harm than good. Some believe that people who live with a mental illness benefit more from tobacco use than from quitting.<sup>11</sup> Others fear that if a person with mental illness quits tobacco, their psychiatric symptoms and negative behaviors will increase.<sup>11</sup> In tobacco treatment programs, a concern is that successful treatment for alcohol and substance abuse can be negatively affected by cessation because clients use tobacco as a coping mechanism.<sup>18</sup>

As an American citizen, the right to personal choice is an essential part of our culture and independence. The choices made can result in life changing events, including those that result from tobacco use. Why one would make a decision (e.g., to start using tobacco, to continue using tobacco, and to quit) can be related to a philosophical, spiritual, ethical, or other essential belief. However, the personal choice to quit tobacco occurs within a larger context.

For example, concerns about adherence to tobacco-free addiction treatment programs and potential affects on program enrollment were documented by Foulds, et al.<sup>2</sup> The authors observed the planning, development, and implementation of tobacco-free policy changes in New Jersey addiction treatment programs.<sup>2</sup> Initially, staff and

community representatives were concerned about negative impacts tobacco-free policies could have on treatment goals.<sup>2</sup>

A five-prong policy, development, and implementation approach included first identifying an organizational leader who formally addressed policy change in this area and who would oversee the organizational change.<sup>2</sup> Second, training for providers emphasized the message that tobacco treatment is imperative to improving health outcomes.<sup>2</sup> Third, collaboration with state agency administrators led to modification of licensure standards for providers.<sup>2</sup> Fourth, funding for additional training and for nicotine replacement therapy was secured through the New Jersey Comprehensive Tobacco Control Program.<sup>2</sup> Lastly, expanding tobacco treatment and training opportunities for

management, front-line staff, and consumers was organized.<sup>2</sup>

Providers required time to prepare and train staff and approximately six months lead time to prepare for going tobacco-free.<sup>2</sup> The planned process included a holding period where providers were not fined for non-compliance.<sup>2</sup> Rather than issue citations, providers were encouraged to comply with new tobacco-free policies.<sup>2</sup> Approximately 50% of providers were compliant with maintaining tobacco-free grounds while the other 50% were not able to maintain 100% compliance.<sup>2</sup>

Nicotine patches and nicotine gum were available with patches the most popular choice. Staff was able to administer and monitor the utilization of nicotine patches on a one patch per day treatment program.<sup>2</sup> Nicotine patches

did not require a doctor's prescription allowing for easier access to smoking cessation options.

Results based on program attendance and enrollment showed no significant difference in regular discharges or reduction in the proportion of cigarette smokers among those entering residential treatment compared with prior years.<sup>2</sup> Lessons learned from this tobacco-free initiative included<sup>19</sup>:

1. Tobacco dependence treatment can be fully integrated into addiction treatment programs.
2. Most patients in addiction treatment programs want to change their tobacco use.
3. Treating tobacco dependence in the context of tobacco-free grounds does not lead to patients leaving treatment early.
4. The greatest resistance to implementing a tobacco-free policy typically comes from staff rather than patients (e.g., with staff that smoke but are in recovery from other addictions sometimes feeling

- that their sobriety is being challenged).
5. Thorough staff preparation and training, along with availability of nicotine replacement therapy (for both staff and patients who smoke), are important components of implementation.
  6. Implementation of tobacco-free grounds is the most challenging aspect of the policy but also is an important driver of other organizational changes (e.g., policies for staff tobacco use, availability of nicotine replacement therapy, etc.).
  7. Not enforcing tobacco-free policies (e.g., state agency enforcement) can detract from their effectiveness.

Potential effects of tobacco cessation on the mental illness itself are another concern. In a study completed by Prochaska, et al., researchers used a random trial to analyze data on current smokers who had a diagnosis of depression.<sup>20</sup> Researchers hypothesized that “if tobacco use serves to self-medicate depressive symptoms,

one would expect psychiatric symptoms to worsen and mental health service use to increase following smoking cessation.”<sup>20</sup> Results of the study focused on the association between mental health functioning and smoking status at pre-determined points in time during the study.<sup>20</sup> Participants who quit smoking self-reported a decrease in alcohol consumption and a decrease in depressive symptoms.<sup>20</sup> Researchers concluded that “individuals who have clinical depression can be helped to stop smoking without adversely affecting their mental health recovery.”<sup>20</sup>

A final concern is that broadly assessing for alcohol and tobacco dependence and offering nicotine replacement therapy or other tobacco cessation options needs improvement. Shourie, et al. recommended, as a result of their research on alcohol and tobacco use for

consumers who are briefly hospitalized, that better documentation of consumer alcohol and tobacco occur.<sup>21</sup>

Implementation of interventions such as drug and alcohol counseling, pharmacotherapy for relapse prevention, and various nicotine replacement therapy may be cost-effective and may help to reduce hospital admission and morbidity.<sup>21</sup>

### **Tobacco Use and Prevention in Hawai'i**

Smoking legislation in Hawaii over the past 25 years shows a positive response to growing concerns about the dangers of tobacco use and exposure to ETS. For example, increasing the tobacco tax, prohibiting smoking in specific areas, regulating the sale of certain types of tobacco products (e.g. flavored cigarettes), and decreasing access to sample tobacco products are

initiatives that have directly affected tobacco use and exposure to ETS in Hawaii.<sup>22</sup> The enactment of the 2006 Hawaii Smoke Free Law prohibited smoking in enclosed or partially enclosed places, including public facilities and private businesses.<sup>23</sup> All places that are designated as non-smoking must have clearly posted "No Smoking" signage including places of employment and common areas.<sup>23</sup>

Smoking is prohibited at the Honolulu International Airport, in arenas and stadium locations, and within 20 feet of doorways, windows, and ventilation systems.<sup>23</sup>

The estimated prevalence of adult cigarette smokers in Hawaii in the 2006 BRFSS survey was approximately 19.2% for men and 16.0% for women.<sup>3</sup> Prevalence was higher in Hawaii, Kauai, and Maui Counties compared to

Honolulu County.<sup>6</sup> Furthermore, tobacco use in West and South Hawaii was higher than in North and East Hawaii.<sup>6</sup> Similarly, tobacco use in the Waianae Coast was higher than in East Honolulu.<sup>6</sup> Native Hawaiians were more likely to smoke cigarettes than other ethnic groups.<sup>6</sup> The less income an individual earned, the more likely they were to smoke cigarettes.<sup>6</sup> Annually, approximately 1,200 adults in Hawaii die from smoking cigarettes.<sup>24</sup> Annual health care costs in Hawaii that are directly caused by tobacco use is approximately \$336 million.<sup>24</sup>

Information published on the Campaign for Tobacco-Free Kids web site identifies that in fiscal year 2009, Hawaii spent \$11.3 million in federal and state funding on tobacco prevention activities, down from \$11.4 million spent in fiscal year 2008.<sup>24</sup> The CDC recommends

Hawaii spend \$15.2 million on tobacco prevention activities.<sup>24</sup> This can be seen in light of \$160.0 million in tobacco generated revenue collected in fiscal year 2009.<sup>24</sup> Hawaii organizations, such as the Hawaii Tobacco Quitline, Coalition for a Tobacco Free Hawaii and Clear the Smoke.org have focused efforts to generate community awareness, and use tobacco settlement funds to promote smoke-free and tobacco-free lifestyles. Local chapters of the American Cancer Society, American Lung Association and the American Heart Association are also involved in ongoing community wellness initiatives.

The Hawaii State Department of Health, Adult Mental Health Division (AMHD) embraces the Recovery Model as part of its mission, vision, core values, and guiding principles. Assisting the whole individual to improve their health and to

encourage positive health choices is a goal of Recovery. The current array of AMHD services includes services such as case management, representative payee, inpatient and outpatient treatment, community housing, Clubhouse, and crisis services.<sup>25</sup>

In fiscal year 2007, a total of 14,576 consumers received services from the AMHD.<sup>25</sup> Honolulu County has the largest number of individuals served (8,589 or 59%), followed by Hawaii County (3,696 or 25%), Maui County (1,537 or 11%), and Kauai County (754 or 5%).<sup>25</sup> Based on diagnoses the top three categories included schizophrenia, depression, and bipolar disorders.<sup>25</sup> A total of 34% of consumers had a diagnosis in the category of schizophrenia and related disorders, 25% had a diagnosis in the category of depressive disorders, and 15% had a

diagnosis in the category of bipolar mood and related disorders.<sup>25</sup> The number of consumers served on an annual basis since 2007 has increased.

However, data collection at the time of initial eligibility assessment for AMHD services does not include a consistent mechanism for capturing information about tobacco use. Consumer self-report data via the Quality of Life Interview (QOLI) and the Mental Health Statistics Improvement Program (MHSIP) do not target tobacco use data collection.<sup>25</sup> However, AMHD has administered a health and wellness survey which included a question about the consumer's tobacco status. Results of that survey indicated that more than half of consumers who responded smoke cigarettes.

Other methods for obtaining data on tobacco use are not systematic. For example, Mental Illness and Substance Abuse (MISA) Coordinators collect data on nicotine dependence, but they do not work with every consumer receiving AMHD services. Anecdotal reports by team leads and case managers show they do inquire about readiness to change for consumers who currently smoke cigarettes. Depending on the consumer's attitude towards quitting smoking, case managers sometimes refer consumers to community resources and other cessation options. Thus, this information is also not collected routinely across the AMHD system and is not required as part of the AMHD provider report.

### **Recommendations for Addressing Tobacco Use in the Adult Mental Health Population**

There is no identified "safe" level of exposure to tobacco toxins.<sup>16</sup> The earlier

in life that an individual quits smoking, the greater the health benefits.<sup>3</sup>

Smoking cessation can effectively reduce the short- and long-term risks of tobacco related diseases.<sup>4</sup> However, Zoller notes that "despite the serious impact tobacco has on their health, finances and quality of life, people with an illness have generally reported they are not asked about their smoking habits."<sup>17</sup> Hagman, et al. specifically recommends monitoring of tobacco use among adults with mental illness.<sup>14</sup> A whole person, holistic approach that includes a culturally sensitive, individualized approach towards addressing tobacco use with adults who live with mental illness is recommended.

Yet opportunities to identify tobacco use abound. Behavioral health providers might monitor consumer tobacco use at the time of initial request for eligibility

and at the time of case manager assignment. Behavioral health providers can additionally monitor psychiatric issues that develop during the course of treatment when they offer nicotine dependence treatment, including addiction assessment and individualized treatment interventions, such as pharmacotherapy, counseling, nicotine replacement therapies, relapse prevention, behavioral therapy and motivational interventions.<sup>14, 26</sup>

Use of specific criteria, including formal and informal methods for collecting consumer self-report is important. Examples of formal tools used to measure nicotine dependence include the Nicotine Dependence Severity Scale (NDSS) and the Fagerstrom Test for Nicotine Dependence (FTND).<sup>11</sup> Nicotine dependence is identified in the Diagnostic and Statistical Manual of

Mental Disorders IV (DSM-IV) as a substance use disorder although it is not routinely diagnosed and incorporated into an individual's treatment plan.<sup>14</sup>

Beyond identification, interventions can begin simply, using a practical approach to engaging in discussion about smoking cessation options. For example, the 5A smoking cessation model requires mental health providers to ask about consumer tobacco use and to congratulate those who do not smoke, to assess consumer who want to quit or reduce smoking, to provide advice about quitting including education about quit options, to assist and encourage consumers at every stage of change and to arrange for follow-up and coordinate support services where possible.<sup>17</sup> In collaboration with the consumer's primary care physician and psychiatrist,

an effective treatment plan including medication management and adherence can be developed to address smoking cessation goals and increase the likelihood of success in quitting tobacco.

Zoller identifies that “people with mental illness need to be given more encouragement to quit and this is best done by mental health workers.”<sup>17</sup> More information dissemination, education, and support needs to be provided to mental health workers.<sup>17</sup> Techniques such as motivational counseling, nicotine replacement therapy and cessation programs can be explored as tools for workers to address tobacco use.<sup>17</sup> However, staff will need to consider what example they set. Williams and Ziedonis note that, “addressing staff smoking in behavioral healthcare settings removes a primary barrier to addressing patient smoking.”<sup>26</sup>

Staff that use tobacco have an opportunity to benefit from an increased presence of tobacco cessation options within their agency or organization.

Individual interventions are best within a larger context. The CDC notes that “fully implementing comprehensive state tobacco-control programs would accelerate progress in reducing rates of smoking and other tobacco use.”<sup>3</sup> Additionally, the CDC recommends reducing “the health and economic burdens of tobacco use by funding and implementing strategies proven effective in four goal areas identified by the National Tobacco Control Program,”<sup>4</sup> including promoting cessation, preventing initiation, reducing exposure and identifying disparities.<sup>4</sup> For example, incorporating tobacco information into mental health and wellness curriculum may offer an alternative intervention

and/or opportunity for lower motivated tobacco users to increase awareness and knowledge of treatment options.<sup>26</sup>

Along the way, facilities should examine their role. Group homes, treatment programs, and social clubs that provide support to adults who live with a mental illness continue to allow smoking on campus thus exposing non-smokers and staff to ETS.<sup>26</sup> In a study conducted by Williams et al., cigarette smokers with a diagnosis of schizophrenia spent approximately one-third of their monthly disability income on cigarettes.<sup>26</sup> The authors also noted that an average smoke break is 13 minutes, and smokers average three smoke breaks per day.<sup>26</sup>

Smoke-free laws can also help. The 2006 Hawaii Smoke Free law provides general guidelines for the prohibition of

smoking in public places, which has helped mental health providers to enforce non-smoking policies and open the door to future opportunities to increase staff and consumer awareness of tobacco prevention and cessation. However, the culture shift towards a whole-person, wellness approach, including increasing opportunities for engaging in non-smoking related activities has not been fully realized. For example, while smoking within 20 feet of doorways, windows and ventilation systems is prohibited, smokers are still able to smoke on the mental health provider's campus beyond the 20 feet limit. Looking to address this change from a state operations level and policy level would increase opportunities to engage in tobacco cessation efforts and to prevent the initiation of tobacco use on campuses where mental health

services are provided and/or are state funded.

Several specific examples of facilities addressing the problem may be instructive. Foulds, et al. studied the affects of a facility wide tobacco-free policy at an addictions treatment facility in New Jersey.<sup>2</sup> Research focused on smoking status, attitudes towards tobacco regulation, willingness to quit tobacco and use of nicotine replacement therapy or cessation options.<sup>2</sup> The facility identified several tobacco related activities, including tobacco assessment, tobacco counseling, availability of nicotine replacement therapy, tobacco in discharge planning, training for staff on tobacco and had a written staff tobacco policy.<sup>2</sup>

Observation of the change identified a recognition of the need for treating tobacco addiction in treatment

programs and the importance of creating an environment that is supportive of tobacco treatment.<sup>2</sup>

Furthermore, addressing staff concerns for tobacco-free policy was a significant part of the positive change process.

Including staff in the change process to treat tobacco use and dependence was therefore highly recommended.<sup>2</sup>

Clubhouses may be particularly relevant, as their model is built on staff and members working on recovery in a side-by-side partnership. It might be speculated that such arrangements would be less open to smoking interventions being thrust on unwilling mental health consumers by staff. The Clubhouse of Suffolk (Ronkonkoma, NY) was awarded a grant from the New York State Tobacco Control Program “to address the special needs of individuals with mental illnesses who struggle with

nicotine addiction.”<sup>27</sup> In October 2003, the Clubhouse of Suffolk “developed a comprehensive model to address the biological, psychological, and social aspects of tobacco dependence in individuals with serious mental illness”<sup>27</sup> At the foundation of the Clubhouse of Suffolk’s Smoking Cessation Project was the “Healthy Body, Healthy Mind” model.<sup>28</sup> Clubhouse members helped to produce a video called “Smoke Alarm”, which highlighted Clubhouse members who reduced or quit smoking and addressed the disparate impact tobacco use had on individuals who live with mental illness.<sup>28</sup>

In Utah (Carbon, Emery, and Grand Counties), the Four Corners Community Behavioral Health, Inc. is a contracted provider of mental health and substance abuse services.<sup>29</sup> They oversee two Clubhouses (Interact Clubhouse and

Price Clubhouse).<sup>29</sup> In their fiscal year 2009 area plan, they acknowledged the importance of educating consumers about the negative health impacts of tobacco use. Through the Clubhouses, the local health department facilitated a six week smoking cessation class where clubhouse members had access to printed information and on-site assistance with smoking and cessation help.<sup>29</sup> In addition to being given the local tobacco Quitline phone number, clubhouse members were referred to cessation programs and were educated about cessation options.<sup>29</sup>

Washington State’s Capital Clubhouse was awarded a grant from TOGETHER! Tobacco Free Thurston County, which helped the clubhouse to start a tobacco-cessation class for members.<sup>30</sup> Using the “Learning about Healthy Living, Tobacco and You” curriculum, the

clubhouse addresses a variety of tobacco and wellness topics.<sup>30</sup> They have seen success in members who have reduced or quit smoking as a result of attending cessation classes at the clubhouse.<sup>30</sup>

Peer support may be another powerful opportunity. Williams discusses the New Jersey CHOICES Program, which offers a peer support network to address tobacco use. CHOICES is an acronym that stands for “Consumers Helping Others Improve their Condition by Ending Smoking”.<sup>31</sup> In 2005, a joint community effort helped to raise awareness of the need to address tobacco use in the mental health system.<sup>32</sup> Organizations such as Mental Health America teamed with consumers to voice their concerns directly to administrators of the Department of Human Services and to the Division of

Mental Health Services, as well as to policymakers, and to ask for funding to support this important culture and positive lifestyle change.<sup>32</sup> The CHOICES Program received grants from the American Legacy Foundation, the University of Medicine and Dentistry of New Jersey Robert Wood Johnson Medical School, Division of Addiction Psychiatry, the Mental Health Association of New Jersey, and the State of New Jersey Mental Health Services.<sup>32</sup> Other funding sources and partnerships included the Cancer Institute of New Jersey and the National Alliance on Mental Illness (NAMI).<sup>32</sup> Peer counselors were classified as Never Smokers or Former Smokers. While they did not provide direct treatment for tobacco, they provided on-site assistance through (for example) health centers, clinics, and health fairs to spread the word. They had an

advocacy role where they assisted consumers with linkage to treatment, provide support and increased awareness through education.

Advantages for using peer counselors were seen to be in line with current peer employment programs.

### **Conclusion**

A multi-disciplinary approach to reducing tobacco use includes educational, clinical, regulatory, economic and comprehensive components.<sup>5</sup> Mental health organizations that embrace tobacco-free policies for consumers and staff using a range of tobacco cessation techniques can reduce operating costs, offer a healthier workplace and direct-service environments, and increase satisfaction rates for staff and consumers.<sup>11</sup>

Developing effective tobacco use prevention and cessation programs for

adults with co-morbid nicotine dependence and psychiatric disorders is highly recommended.<sup>15</sup>

Funds are needed, as are collaborations. Research on state funding levels for tobacco prevention and control programs indicates that the more states spend on programs the greater the resulting reduction in smoking.<sup>4</sup> Also, the longer that the states continue tobacco control programs, the greater and faster the impact.<sup>4</sup> Possible resources to be considered for funding the integration of tobacco cessation options include tobacco settlement funds, transformation grant funds, block grant funds, Medicare funding state excise tax revenue, general state funds, and federal and private funds.<sup>5</sup>

Collaboration with the Hawaii State Department of Health's Tobacco Prevention and Education Program would be helpful in developing a comprehensive statewide strategic plan for addressing tobacco use in the public adult mental health system. Additionally, partnerships with community organizations "including universities, various health organizations, and local groups that can help reach populations disproportionately affected by tobacco use" are recommended.<sup>5</sup> For example, the Pacific Center on Health and Tobacco (PCHT) is an organization that assists with the development of evidence-based statewide tobacco cessation programs.<sup>33</sup> The National Council for Community Behavioral Healthcare offer innovative strategies incorporating best practices for use in community mental health centers. They

also offer technical assistance and training to behavioral health providers.

This review of published literature on the topic is intended to increase awareness of the need for positive change and offer recommendations for next steps, both nationally and here in Hawai'i. For the practitioner reading this article, consider taking a first step towards positive change by assessing your organization's readiness to address this public health issue. Identify opportunities for improvement, including current practices with the goal of better health outcomes and increased quality of life for both staff and consumers. Recommendations discussed in this article should help you to address this important public health issue.

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## **Addressing Diversity in Health Disparities Research**

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**Abstract:** Many potential areas of concern emerge when planning and conducting research with diverse populations. To assure that these issues are considered and addressed appropriately, it may be helpful for investigators to employ a conceptual framework. Researchers are very familiar with the logical flow of presenting proposals or research papers. These basic sections of a standard paper can be used as a template to consider key issues in all phases of research projects that involve diverse populations. This template may serve as a guide for investigators as they consider the unique circumstances of each project.

**Key words:** disparities research, diversity, at-risk populations, disadvantaged, poverty, barriers, ethics, community-based, ethnicity, race, cross-cultural, socioeconomic

## Introduction

Researchers commonly explore differences in health outcomes among diverse populations, with the overarching goal of reducing health disparities. These studies evaluate differences in risk and protective factors, disease prevalence, and treatment outcomes in order to improve health and reduce inequalities among various ethnic and racial groups. Many studies, however, do not clearly describe how or why particular participants were recruited, and how this may affect results and interpretation of these results. There is little consensus on how to specifically define or collect ethnicity and race information among diverse populations where the standard categories may not be appropriate. Despite mandates to include a breadth of ethnic and racial groups in research, many remain underrepresented in studies and may not be reaping the potential rewards of research. This may lead to imbalanced, substandard, or even harmful policy and health care recommendations. As our society becomes increasingly multiethnic, these issues will become more and more complex. This paper offers a framework to consider the many issues researchers must weigh when designing and implementing health care studies among diverse populations.

## Definitions

There are key definitions that need to be understood in order to discuss the complex issues

involved in conducting research among diverse populations. These definitions seem intuitive, however, they are often confusing, vague, or different according to which source is used as a reference.

The following are just a few examples:

1. Ethnicity: The term “ethnicity” means many things depending on whom you ask. The Merriam-Webster’s definition of ethnicity is an “ethnic quality or affiliation” or “a particular ethnic affiliation or group”<sup>1</sup>. This is clearly redundant and does not offer a true definition of the word. “Ethnic” is then further defined as “heathen”, with obvious negative connotations that may further enhance stereotypes and prejudice. The second definition is less biased but rather broad: “of or relating to large groups of people classed according to common racial, national, tribal, religious, linguistic, or cultural origin or background”<sup>1</sup>.

According to the Encyclopaedia Britannica definition, ethnicity refers to “a social group or category of the population that, in a larger society, is set apart and bound together by common ties of race, language, nationality or culture”.<sup>2</sup> The idea that ethnicities are “set apart” implies isolation and exclusion. It is clear from these many definitions that ethnicity encompasses many facets, some of which may be rather vague or difficult to put into concrete, measurable terms and some of which may sound derogatory.

2) Race: Race and ethnicity are often confused or used interchangeably. Even the definitions of race according to Merriam-Webster’s Dictionary are not clear or consistent, as race is defined as “a: a family,

tribe, people, or nation belonging to the same stock **b** : a class or kind of people unified by shared interests, habits, or characteristics”<sup>1</sup>.

Using the first definition, race may help understand genetic issues or where a person’s ancestors came from originally. It may, however, have little relevance in one’s health status, which may be more based on cultural ideals, beliefs, and environment than on race. The second definition confuses the issue further, as it seems to define ethnicity rather than race.

3) majority: NIH guidelines define majority as “White: a person having origins in any of the original peoples of Europe, the Middle East, or North Africa”.<sup>3</sup>

4) minority: NIH guidelines define a minority group as “a readily identifiable subset of the U.S. population that is distinguishable by racial, ethnic, and/or cultural heritage”.<sup>3</sup>

5) Disadvantaged: According to Merriam-Webster’s dictionary, disadvantage means “handicap or detriment”.<sup>1</sup> Often this term is used to describe research participants who are either living in poverty or other substandard environments, but it is also used to describe the less common racial/ethnic groups that the majority group labels as “minority”. In research terms this typically equates to considering minority populations as disadvantaged or at-risk, as evident in this definition by Rogers 2004: “groups subject to social exclusion or deprivation for

reasons such as low socioeconomic status, ethnicity, gender, mental ill health, or similar”.<sup>4</sup>

### **Brief Background on Policy**

In response to evidence of continuing disparities in health outcomes and minority participation in clinical research, the NIH signed into law the NIH Revitalization Act (PL-103-43) in 1993. This statute states: “in conducting or supporting research...the Director of NIH shall...ensure that... members of minority groups are included in such research”. It also further provides guidelines about when these inclusions may be inappropriate as well as “the manner in which these trials are to be designed and carried out”.<sup>3</sup>

There are a few notable exceptions to the requirement to include minorities such as:

- 1) if it is inappropriate with respect to the health of the subjects
- 2) if it is inappropriate with respect to the purpose of the research; or
- 3) if it is inappropriate under such other circumstances as the Director of NIH may designate

The guidelines also state that inclusion may not necessarily be required (although it is encouraged) if there is already “substantial scientific data”<sup>3</sup> indicating no significant differences based on race or ethnicity.

The US government has also produced policy to address the ongoing health disparities in this country. The Department of Health and Human Services has put out an initiative to eliminate racial and ethnic

disparities in health by 2010 and to “investigate and address the underlying causes of these disparities”.<sup>5</sup> This emphasizes the need to first understand disparities utilizing sound research design in order to be able to adequately address the factors contributing to these disparities.

### A Conceptual Framework

Many potential areas of concern emerge when planning and conducting research with diverse populations. To assure that these issues are considered and addressed appropriately, it may be helpful for investigators to employ a conceptual framework. Researchers are very familiar with the logical flow of presenting proposals or research papers. These basic sections of a standard paper can be used as a template to consider key issues in all phases of research projects that involve diverse populations. Table 1 summarizes the template, raising some of the issues to consider at each stage. This template may serve as a guide for investigators as they consider the unique circumstances of each project (Table 1).

**Table 1. Framework for Addressing Diversity in Health Disparities Research**

|   |
|---|
| 1. Introduction   |
| What is the study question and rationale for including race and ethnicity data? |
| <b><i>Will including race and ethnicity data be important?</i></b>              |
| 2: Background   |
| <b><i>What is known about racial and ethnic</i></b>                             |

|  |
|--|
| <b><i>differences related to the topic of study?</i></b>   |
| 3: Methods   |
| <b><i>What is the research setting and how will the ethnic and racial groups be defined?</i></b>   |
| <b><i>Is the study population considered “at risk” or in need of additional protection?</i></b>  |
| Who will be included in the study?<br>Who will be excluded from the study?<br>How will the population be sampled?<br>How will the participants be recruited and potential barriers be addressed?<br>How will participants in intervention studies be assigned?<br>What variables and instruments will be used? |
| 4: Analysis  |
| How will the race and ethnicity data be analyzed?  |
| 5: Results   |
| How will the results be presented and disseminated?<br>What is the potential effect of the results on the community or group?  |
| 6: Discussion and Limitations  |
| What are the limitations of the study and alternative explanations?  |
| 7: Conclusions   |
| What are the implications for health care or policy?   |

### Section 1: Introduction

*What is the study question and rationale for including racial and ethnic data?*

The first phase of developing a research project is identifying a specific question to be answered and a rationale for its exploration. Investigators are aware of how critical it is to establish a clear and concise question that can be answered with any proposed

research study. The research question guides the study design. Similarly, when considering the project, one should have a clear idea about the specific questions to be answered by including race and ethnicity data. These data are required by the National Institutes of Health (NIH); however, each investigator should understand the potential relevance of such data to the study question. One should ascertain whether there is a scientific or logical rationale for including ethnicity and race as variables when designing a project. Indeed, the NIH places responsibility on the principal investigator to “assess the theoretical and/or scientific linkages between...race/ethnicity and their topic of study”.<sup>3</sup> For example, racial discrimination has been shown to effect health outcomes such as blood pressure,<sup>6</sup> and exploring these types of relationships can not only help identify at risk groups for interventions but also to point out ongoing inequalities that may push forward social change.

*Will including race and ethnicity data be important?*

The introduction to a research paper typically describes how answering the research question will improve scientific understanding or health outcomes. The investigator should consider how racial and ethnic data may be important to the study question and to science in general. The Human Genome Project documented that any

two individuals differ genetically by only 0.1 per cent,<sup>7</sup> apparently diminishing the value of using race as a predictor for health outcomes. To be sure, “genetic differences between racial groups are minute and ... there are greater differences within racial groups than between them”.<sup>8</sup>

There are some instances, though, when minute variation in genetic material can account for significant differences in clinical outcomes. Multiple studies have established race- and ethnicity-related differences in genes that determine rates of disease prevalence,<sup>9,10</sup> receptor affinity for medications,<sup>11,12</sup> drug metabolism rates,<sup>13,14,15</sup> risks of adverse medication effects or toxicity,<sup>16,17</sup> and even cancer risk.<sup>18,19</sup> Knowledge of higher risk of specific diseases or cancer types in a particular population enables a practitioner to screen an individual or provide preventive medicine, thereby increasing the likelihood of early intervention and improved outcomes. Similarly, known differences in responses to medications may guide their prescription. Pharmacogenomics informs physicians of potential increased toxicity (due to slow metabolism) or the possible need for higher doses or alternative medications (due to rapid metabolism). Thus, in some cases, minute differences in our genetic composition may account for significant variation in our response to treatment. In these cases it is important to study potential racial and ethnic differences, as they may elucidate factors relevant to improving care for certain groups.

Although racial categories are the current means of considering these possible risks or outcomes, in the future, genotyping and other biochemistry techniques may become noninvasive, affordable, and a part of every day practice. This would negate the need for racial information, as the clinical decisions would be based on each individual's unique genetic and biochemical makeup. Until then, however, knowledge of potential racial differences in disease rates and therapeutic responses may be valuable information to help guide clinical practice.

Genetic differences based on race are only part of the equation, and typically complex trait diseases, such as high blood pressure or diabetes, are thought to be due to interaction between genes and the environment. "Genetic variants predispose us to, but do not invariably cause, common diseases".<sup>20</sup> There are many key socioeconomic factors which influence health behaviors as well as health outcomes, such as poverty, educational level, and environmental issues such as overcrowding, violent households, exposures to drug or gang culture, and many more. Rathore notes that race and ethnicity only "serve as proxies for a mix of genetic, disease, social, behavioral, or clinical characteristics that vary by groups".<sup>21</sup> As such, the investigator may include race and ethnicity data in order to document that disparities continue to exist,

regardless of the cause. The knowledge that particular groups may face greater risk for substandard health care or certain illnesses may allow for more targeted and cost-effective prevention programs. Such data may also guide policy makers and social services administrators as they seek to address some of the factors underlying health disparities.

## **Section 2: Background**

*What is known about racial and ethnic differences related to the topic of study?*

The background section is where the author typically explores why the study question is relevant and what data is currently available or lacking to support it. Studies can aim to discover new information as well as to either replicate or refute earlier work. The investigator must have a strong foundation and understanding of the topic and the current state of the literature. Similarly, choosing racial and ethnic variables should be based on the investigator's understanding of relevant literature. The researcher should be familiar with prior research in the field that has either supported or refuted disparities based on race or ethnicity. If there is no data, or if the data is controversial or inconclusive, this would support exploring potential disparities in order to enhance scientific knowledge.

### Section 3: Methods

*What is the research setting and how will the ethnic and racial groups be defined?*

One of the first things researchers need to consider when designing the project is where the research is going to take place, including the likely groups or subgroups represented. There are certain areas where the commonly used simplistic categories may not be relevant or adequate. One example is the State of Hawaii, where no “majority” population exists. According to the 2006 census, Hawaii has only 26.3% Caucasians;<sup>22</sup> thus the NIH’s definition of majority being “White” does not apply. In Hawaii, Asians represent 40% of the population<sup>22</sup> and therefore represent the numeric “majority”. In addition, 21.5% report two or more ethnic groups,<sup>22</sup> thus a study conducted in Hawaii is likely to include large numbers of mixed ethnicity participants, complicating data analysis and interpretation of results. Nationwide, more than six million people reported two or more races.<sup>22</sup> The investigator must consider the setting and the population in order to decide how to best define and collect race and ethnicity data, including how detailed the subgroups will be. The current system does not necessarily allow for accurate identification of or distinction between subgroups. The NIH encourages investigators to collect greater detail when appropriate in a

matter that allows for aggregation into the standard “required categories”.<sup>3</sup> Prior to the recent recommendations, Asians and Pacific Islanders were combined as a single category. Literature and census data show that the Asian American and Pacific Islanders are extremely diverse groups, representing over 50 countries, 100 different languages, and a wide variety of socio-economic indices.<sup>23</sup> Further, according to the 2000 US Census, the majority of the Asian American population (69%) is foreign-born, whereas the Pacific Islanders are mostly indigenous (81%).<sup>24</sup> There is also evidence that Pacific Islanders have poorer health outcomes, including shorter life span and higher rates of infant mortality.<sup>23</sup> In response to these differences, the standards now include separate categories for Asians and Pacific Islanders. NIH defines Asian as a person “having origins in any of the original peoples of the Far East, Southeast Asia, or the Indian subcontinent including for example Cambodia, China, India, Japan, Korea, Malaysia, Pakistan, the Philippine islands, Thailand, and Vietnam”.<sup>3</sup> Clearly, this comprises a tremendously vast and diverse group of over 13 million people in the US alone.<sup>22</sup> Asians are the majority in Hawaii and under the current system would be lumped together, despite extensive evidence that there are many differences in health status and behaviors between groups.<sup>25</sup> Similarly, the category of Pacific Islander does not adequately capture the very different groups of Hawaiians,

Polynesians and Micronesians that are common in Hawaii.<sup>26</sup>

Here it is also important to recognize the difference between race data based on lineage or ancestry and data based on the individual's ethnic or racial personal identification. Genetic research is concerned with ancestry and specific percentages of inheritance, however, behavioral health research recognizes that personal identification can also impact health outcomes. For example, someone with mixed ancestry in Hawaii may identify strongly with only one group, and this may influence certain health behaviors more than the actual genes that were inherited. It may be useful to ask the participant's race based on lineage as well as including an additional question about which race they most identify with, to help delineate the effect of these factors during analysis.

Hawaii is only one example where the standard categories are inadequate to describe the multiethnic population. Over time, ethnic and racial diversity will continue to increase around the world, with continued blending of racial categories across the nation and globe, making distinctions more and more difficult. The investigator should pay meticulous attention to these definitions, thereby ensuring adequate representation of the participants as well as meaningful analysis and interpretation of results

*Is the study population considered “at risk” or in need of additional protection?*

Regardless of race or ethnicity, the investigator must always consider whether the study population may be more likely to enter the study because of undue influence or coercion. For example, in some instances, due to poverty, participants may be more easily swayed by financial incentives. There may also be areas where access to care may be so limited that providing any health care may be considered a strong incentive. In these cases, certain groups may be more likely to expose themselves to high-risk studies that financially secure individuals would not even consider. This may disproportionately place the burden of the study on poor or disadvantaged populations.

*Who will be included in the study?*

The NIH mandates the inclusion of diverse groups in clinical research. All racial and ethnic groups should be given the opportunity to participate in research projects and should not be unfairly excluded or subject to any greater risk than others participating in a trial. Available data indicates that many groups are not adequately represented, with study participants being more likely to be White, insured, and from middle- to upper-class SES groups.<sup>9</sup> This may be considered unjust if one assumes that the participant may experience a benefit from being in

the study by having access to health care or new and potentially better treatments that may not otherwise be available. Research ethics implore investigators to ensure equal distribution of risks and benefits within each clinical trial, and to do their best to offer all groups the opportunity to participate. Investigators unfamiliar with a particular community should consider involving a community liaison, cultural consultant, or community advisory board to enhance the study's effectiveness and appropriateness. Community-based research models<sup>30</sup> can also be used to engage the community in all phases of the research process. This approach can provide an additional layer of protection for both investigators and participants, and empower community members by engaging them as stakeholders in the research.

#### *Who will be excluded from the study?*

To exclude a racial group from a study is to deny not only the direct benefits of the trial, but also the potential of improved health care based upon the results. Knowledge gained may only be applicable to the groups specifically represented in the study. As in the example of differing drug metabolism, not having information about diverse populations represents an unfair distribution of benefits of research. Even worse, treatments could be potentially dangerous if not studied for safety and efficacy in a particular group. It is

unethical to harm patients merely because researchers neither asked nor answered pertinent questions.

Certain groups may also be more likely to be excluded from trials due to an increased presence of co-morbidities. Often, especially in randomized controlled clinical drug trials, participants are excluded if they have co-morbid illness, in order to ensure that the two groups are similar in every aspect other than the treatment. If certain ethnic and racial groups have higher levels of these other illnesses, this may result in exclusion more often from clinical studies.

Lack of data for certain groups may also negatively influence policy decisions. If administrators and policy makers lack comprehensive information, they may base their judgments upon gross inaccuracies and naïve assumptions, leading to a "one-size fits all" approach to medical treatment and care. Thus, excluding diverse groups from research may lead to an "overall picture [that] will be deceptive and will lead to unfair policy decisions".<sup>3</sup>

#### *How will the population be sampled?*

If the study results are not valid or meaningful, investigators violate their ethical duty to maximize benefit and minimize risk to participants. Therefore, careful consideration in the methods section is imperative when deciding how the study sample will be selected. A minimum number of participants is

needed in each subgroup to obtain the statistical power to accurately analyze the data. This may occur naturally in certain areas; however, it may also be necessary to adjust the sampling method and over sample certain groups to acquire the needed numbers to answer the research question. The investigator should always provide clear justification for over sampling of certain groups. Utilizing community and cultural advisors in a community-based participatory research (CBPR) approach may enhance recruitment of specific groups among the population or area being studied.

*How will the participants be recruited and potential barriers be addressed?*

Inequality in participation in research may not be entirely due to researchers' design or sampling, it may result from other barriers, including financial, linguistic, educational, or other socio-economic factors. NIH provides a manual and urges investigators to "develop appropriate and culturally sensitive outreach programs and activities commensurate with the goals of the study...to actively recruit and retain the most diverse study population consistent with the purposes of the research project".<sup>3</sup> In order to adequately include certain groups in studies, researchers should address potential barriers to participants' involvement in the study. Here again, it may be helpful to utilize a CBPR

approach to effectively reach, engage, and protect the participants.

Trust Barriers: Distrust (of research, researchers, and institutions in general) is often cited as an important barrier to participation in clinical research. Certain groups may be less likely to consent to research protocols due to cultural values or historical violations such as the Tuskegee experiment. Research has revealed that improving levels of trust and communication are important and may increase participation in trials for particular groups.<sup>27,28</sup> Starting with qualitative studies to explore potential issues in the community where the research is being conducted may guide strategies to improve enrollment. A large study of over 70,000 individuals, however, found "very small differences in willingness of minorities, most of whom were African American and Hispanics in the U.S., to participate in health research compared to non-Hispanic whites".<sup>29</sup> This indicates the likelihood of other factors, such as those mentioned below, contributing to lower rates of diverse groups participating in research.

Language and Educational Barriers: If non-English speaking participants are involved, proper double-translation of consent forms and other materials should be available, as well as study staff with at least a working knowledge of the participants' native language. This is also needed to protect participants and ensure their valid consent, which entails a complete understanding of the project, risks and

benefits, and a right to decline participation or withdraw from a study. Written translated materials may not suffice; it is important to assess reading ability in English- as well as non-English speaking groups, and to provide verbal information or interactive translation if needed.

For all groups, written materials should use simple language, be easy to understand, and be geared toward elementary school levels.

**Social and Economic Barriers:** Many study investigators use phone or clinical encounters to recruit and enroll participants. Certain groups may be unintentionally excluded, such as those without a telephone or transportation to the clinical trial site. The burden of time and effort to participate in a trial may also be greater for those who must travel long distances, cannot afford to miss work, or require child-care. Consideration of barriers prior to initiating recruitment will facilitate an effective approach to reaching as broad a sample as possible, and will enable investigators to budget appropriately as they seek to alleviate such barriers. In any case, the NIH states that cost is “not a permissible consideration in determining whether such inclusion is inappropriate”.<sup>3</sup>

*How will participants in intervention studies be assigned?*

Social justice dictates that the risks and benefits of a trial should be fairly distributed. Mechanisms must be in place to assure that potential benefits and burdens of research are evenly distributed among ethnic and racial groups. If prior studies demonstrate potential benefit of a new drug, it would be unjust to assign a particular group to the treatment group more often than others. Similarly, if a medication is believed to have serious side effects, it would be unjust to have unbalanced enrollment in the treatment group as these participants would face increased risk of adverse outcomes. The clearest method to achieve equality is to utilize a randomization process to assign subjects to different arms of the study. The investigator must decide on a strategy that will prevent potential biases, conscious or unconscious, from influencing the assignment process.

*What variables and instruments will be used?*

**Variables:** In order to provide a more accurate estimate of the influence of race on health outcomes, it is important to control for known confounding variables such as SES, education, and social and environmental contexts. Community advisors may again be helpful to identify specific variables applicable to the population being studied that may have been overlooked by an outside observer, for example: number of people living in the home, involvement of extended family members, informal supports (presence or lack thereof), generation of immigration and other acculturation factors. Failure

to include this information may lead to inappropriate conclusions. Clearly, these social and economic factors typically have the most significant effect on health outcomes, either directly or as moderators. Health disparities research that includes these variables in models examining both causal and mediating effects is beneficial in justifying socially and culturally appropriate interventions and policy changes.

Instruments: Few research instruments have documented validity and reference norms in diverse populations. Validity is a contextual construct, therefore only applies to the population in which it was originally studied. There may be cultural differences in the interpretation of questions or the expressions of answers. Many instruments are based on ethnocentric ideals that may not be shared by other groups. Similarly, care must be taken that any translated instruments appropriately represent the concepts they intend to measure. Certain words may not be easily translated or hold their original contextual meaning in another language, thereby invalidating the instrument for some groups. If norms are not available or little is known about using an instrument in a particular population, Sue et al. suggest strategies such as “using multiple measures or multi-method procedures to determine if tests provide convergent results”.<sup>23</sup> Such strategies bolster the investigator’s credibility and lead to more meaningful results.

## **Section 4: Analysis**

*How will the racial and ethnic data be analyzed?*

NIH requires that proposals “include a description of plans to conduct analyses to detect significant differences in intervention effect by...racial/ethnic groups...and relevant subpopulations if relevant”.<sup>3</sup> Where data exists to support no difference between groups, collection and analysis by racial/ethnic groups remains “strongly encouraged”.<sup>3</sup> The type of analysis chosen may drastically alter the result. With the current standards, one could analyze each of the groups or subgroups distinctly, placing anyone with more than one claimed race into a “mixed” category. To be sure, an African American/Caucasian is likely to be quite different from someone of Japanese/Hawaiian descent. Other studies analyze based on “primary ethnicity”, losing valuable information relevant to “mixed” groups. While analysis of every conceivable ethnic or racial combination may be impractical, the investigator should carefully consider the implications of utilizing various data analysis methods.

## **Section 5: Results**

*How will the results be presented and disseminated?*

It is common practice, unfortunately, for researchers to leave the community once a study is complete,

never returning to share the results with community members who participated in the project. Participants are entitled to this information and researchers should disseminate results in a manner that is meaningful and beneficial for the community involved. This means thinking outside of the research-journal-publication box and discovering new venues such as gatherings, magazines, newsletters, or even the newspaper. Here again is a useful place to utilize community advisors or a CBPR approach to guide methods of dissemination that will effectively reach the community members.

*What is the potential effect of the results on the community or group?*

Some have argued that “race is not a biological construct that reflects innate differences, but a social construct that precisely captures the social classification of a people in a race-conscious society and therefore measure the impact of racism”.<sup>10</sup> Investigators must exercise caution, ensuring that highlighting racial differences does not cause more harm than good. Pointing out higher risks among certain groups may lead to further stereotypes and stigmatization. The members of the group may develop negative self-perceptions or a sense of inferiority to other groups. The use of race and ethnicity to label individuals exemplifies the “social risk” involved in health disparities research.<sup>31</sup> Racial

differences could also potentially lead to repercussions related to access to services or insurance. For example, given the potential increase in cost, insurers may be less likely to offer coverage for certain groups that may demonstrate less than optimal health indicators.

## **Section 6: Discussion and Limitations**

*What are the limitations of the study and alternative explanations?*

The investigator must acknowledge limitations of the study related to ethnic or racial findings. It is important not to over generalize results based on small numbers or members who do not adequately represent a particular subgroup. One must also consider whether statistically meaningful results are actually clinically relevant. Differences may emerge between and among groups due to large sample sizes; nevertheless, these differences may not affect clinical care. For example, with a trial measuring blood pressure, it may be possible to have a large enough sample to find a difference of 2 points in pressure between groups to be statistically significant. In clinical practice, however, this 2-point difference may have no bearing on health status, treatment, or prognosis. One should also discuss any difficulties that arose when defining the ethnic/racial groups or in analyzing the data. Mentioning the effect of different methods on results will strengthen the study, allowing the reader to more

effectively determine applicability to other studies and clinical settings.

## **Section 7: Conclusions**

*What are the implications for health care or policy?*

Researchers should exercise caution in interpreting the results and making recommendations regarding racial and ethnic differences, especially in cases where other social and economic factors likely play a dominant role. In these cases, results may inform policy and social services designed to reduce disparities and improve the health of disadvantaged populations. Study findings may also suggest areas of potential research needed to further understanding of disparities.

Similarities that emerge in health disparities research are also vital to reveal, as they illustrate the fact that, as humans, we are more alike than we are different.

## **SUMMARY**

Many considerations arise in the conduct of research involving race and ethnicity data. In light of these considerations, investigators should assess the multitude of options for defining, reporting and analyzing this data, exploring diverse implications for study results and

associated recommendations. Indeed, it is incumbent upon each researcher to reflect on the purpose of the study, rigor of the science, possible risks, and expected outcomes. This thoughtful consideration will protect individual participants as well as advance the state of the science in a way that has meaning for diverse members of our multi-ethnic, multi-cultural communities.

## **Acknowledgements**

This work was funded in part by grant number 1 R25 RR019321, "Clinical Research Education and Career Development (CRECD) in Minority Institutions." National Center for Research Resources, National Institutes of Health. Special thanks to the administration, professors, and students of the University of Hawaii, John A. Burns School of Medicine, PhD in Clinical Research Program!

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**Incorporating a DVD-led Exercise Program in Elementary Schools:  
A Feasibility Study**

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**Abstract**

Cancer is linked to obesity, and Native Hawaiian childhood obesity rates are high. Examined was the feasibility of incorporating a 15-20-minute, DVD-led physical activity intervention with defined exercise intensity into the elementary school day.

Methods. Anthropometric measures were taken at baseline and 14 weeks later for 330 students in grades 1-6, 205 students in classrooms that received the intervention and

125 students in classrooms that did not. Results. There were indications that the students receiving the physical activity intervention realized significantly smaller increases in calf skinfolds thickness and estimated percent body fat. Teachers of participating students felt they could continue the intervention in their classrooms.

Conclusions. Incorporating a 15-20-minute DVD-led program into the school day may be a feasible way to help counter childhood obesity.

Key words: Children, obesity, Pacific Islander Americans, physical activity, primary school, school-based program

Research has shown that obesity increases risk for cancer, while regular physical activity reduces it.<sup>1-4</sup> Obese children are more likely to become obese adults, and adult obesity is difficult to treat.<sup>5</sup> In 2007, 9 million (16%) US children ages 6 to 19 were overweight or obese, a 3-fold increase since 1980; at current trends, 15 million children may be overweight or obese by 2020.<sup>6</sup> Contributors to the childhood obesity problem include increased access to foods (especially those high in calories, sugar and/or fat), increased opportunities for sedentary leisure (nationally, 45% of children report at least 2 hours of “screen time” per day), decreased availability of safe places for children to play; and a decrease in quantity and quality of physical education required in schools.<sup>7</sup> The problem is even more serious in minority populations, including Native

Hawaiians.<sup>8-9</sup> In a 5-year semi-longitudinal study of Native Hawaiian school children, the prevalence of obesity was twice as high as reported nationally through NHANES III.<sup>9</sup>

Vigorous physical activity and healthy (low-fat/calorie) diets are two key interventions for preventing and reducing obesity. As a majority of children are enrolled in school, many interventions to reduce childhood obesity have been designed for and tested in schools. Two recent reviews suggest that school-based interventions focusing on physical activity (rather than on dietary behavior solely or in combination with physical activity) can have a positive impact on body composition, chronic disease risk factors and fitness.<sup>10-11</sup> However, decreasing resources and increasing academic

demands on schools limit their ability to offer physical activity programs.

For the healthy adult, it has been well documented that exercise should be vigorous enough to increase heart rates to 65% of maximum for a sustained period of time.<sup>12</sup> Regular exercise is recommended for children, as well, but the intensity at which that regular exercise should be administered to children has not been well determined. This Hawai'i-based research team worked for several years to develop simple interventions that can be easily incorporated into the school day. A recent focus has been on developing a DVD-led exercise program that allows children to safely sustain an increased heart rate and could be delivered in a relative short amount of time. Through lab-based research, this research team found that middle-school students

engaged several days a week in a physical activity routine requiring 2,500 steps within 20 minutes achieved an average total heart rate of 151 beats/minute (approximately 65% of their maximal heart rate) and that they realized reductions in body fat.<sup>13</sup>

Following these research results and using 60 - 65% of maximal heart rate as our target exercise heart rate, the researchers developed protocols for the duration and intensity of exercise necessary for the maintenance of healthy body weights for students in grades 1-6 (Table 1).

Table 1. Exercise protocols by grade level, as recommended and achieved

| Grade |             | Duration | Steps | % Steps | Steps/min | Target exercise heart rate (beats/min) | % of target exercise heart rate |
|-------|-------------|----------|-------|---------|-----------|--|---------------------------------|
| 5-6   | Recommended | 20 min   | 2500  | 100%    | 125       | 136                                    | 100%                            |
|       | Achieved    | 20 min   | 2370  | 95%     | 119       | 140                                    | 103%                            |
| 3-4   | Recommended | 20 min   | 2400  | 100%    | 120       | 127                                    | 100%                            |
|       | Achieved    | 20 min   | 2153  | 90%     | 108       | 140                                    | 110%                            |
| 1-2   | Recommended | 15 min   | 1800  | 100%    | 120       | 128                                    | 100%                            |
|       | Achieved    | 15 min   | 1540  | 86%     | 103       | 132                                    | 103%                            |

Developed were music-based exercise routines, similar to step aerobics, which incorporated these guidelines. Working with a university theater department, the research team produced DVDs at 3 levels—grades 1-2, grades 3-4, and grades 5-6. The purpose of this study was to determine the feasibility of incorporating this DVD-led exercise intervention into the school day of elementary school children in rural Hawai'i. The study was approved by the Native Hawaiian Institutional Review Board and the Hawai'i Department of Education.

## Methods

### Setting and Procedures

A single elementary school in a rural community of Hawai'i as selected because of its high proportion of Native Hawaiians and its willingness to serve as a pilot site. The school has four classrooms for each grade level. Fliers describing the study and parental consent forms were sent home with students in all 24 classrooms. School officials discouraged randomization. Thus at each grade level, the two classrooms with the highest number of children with returned consents were

selected as the intervention classrooms, and the other classrooms became the control classrooms. A child assent process was administered. Although 349 returned consent forms, there was some drop out (described under findings). In all, 330 students in grades 1-6 participated, 205 students in classrooms assigned to receive the intervention and 125 students in control classrooms.

The intervention was delivered in the school cafeteria by sport science students affiliated with Brigham Young University—Hawai'i (BYU-H), which is located in the same rural community as the elementary school. Three different exercise sessions were offered—for grades 1-2, grades 3-4, and grades 5-6. Students in the intervention classrooms came to the cafeteria during the time scheduled for their exercise program.

Those children for whom there was no consent (less than 5 per intervention classroom) sat and did homework while the other students followed the exercise DVD. Students in the control classrooms remained engaged in academic activities in their own classrooms.

The intervention was delivered for 37 days over 14 weeks, 3 days per week (except weeks with holidays). The first few sessions, students were learning the routines as they participated, coached and monitored by the college students for safe and effective exercise technique. The teachers were invited to join in, although most spent the time monitoring their exercising and non-exercising students. At the end of the semester, each classroom received a set of DVDs, and each grade level received \$300 to apply toward exercise equipment.

## Measures

Attendance was recorded at each session. To confirm that the students were achieving the prescribed number of steps and recommended heart rate, five students were selected each exercise day to wear two pedometers and a heart rate monitor. Readings were taken immediately after the exercise session. Five different students were selected every exercise day, and readings were averaged.

Collected were anthropometric data at pre-test (baseline) and post-test (post-intervention) from children in intervention and control classrooms for whom both parental consent and child assent had been obtained. In collecting pre- and post-test data, students were rotated through stations at which members of the research team collected weight and height, waist and hip

circumference, and triceps and calf skinfolds according to the Anthropometric Standardization Reference Manual.<sup>14</sup> Stations for girls were separated from those for boys, and measures were taken by same-gender adults. The same people staffed the same stations at both data collection points. Body mass index was calculated from weight and height, and estimated body fat (%) was calculated using equations developed by Slaughter and colleagues.<sup>15</sup>

For boys: Body Fat (%) = .735 (triceps skinfolds + calf skinfolds) + 1.0.

For girls: Body Fat (%) = .610 (triceps skinfolds + calf skinfolds) + 5.1.

Additionally, teachers of intervention and control classrooms were asked to complete a short survey on their perceptions of the program. They were asked about perceived benefits, e.g., how much they agreed that the students who participated in the DVD-led

exercise program got more exercise, had more energy, were better able to concentrate in the classroom, or had fewer behavioral management issues, (from 1=strongly disagree to 4=strongly agree). Also asked was how much they agreed that: a) adding exercise to the school day was a good idea; b) it was easy to include the DVD-led program in the school day; and c) they could use it in their own classrooms with (or without) assistance. Open-ended items solicited what they liked best and how the program could be improved.

### **Analysis**

Data were managed and analyzed using the SPSS system.<sup>16</sup> Given the multiethnic nature of Hawai'i, a wide range of values for height, weight, circumferences, and skinfolds within each grade level at baseline and follow-up was seen. A series of two-way ANOVA analysis were used to examine

differences between the pre-test and post-test scores for treatment groups and grades of the measured and created variables using weighted least squares. To test eight different variables in sequence and have the overall error rate be 0.05, we needed to apply the Bonferroni adjustment, which means that p-values needed to be less than 0.00625 to be significant at the 5% level ( $0.05/8 = .00625$ ).<sup>17</sup> For feasibility data, the frequencies and a summary of comments from the open-ended questions are reported.

### **Results**

As shown in Table 1, students in the three grade levels (1-2, 3-4, and 5-6) achieved 86%, 90%, and 95%, respectively, of the protocol's recommended steps. As a field study and considering the ages of the subjects, these researchers believe that these accomplished percentages of the

exercise protocols are reasonable and acceptable. Additionally, the students' exercise heart rates were higher than initially estimated in the exercise protocols. The students in grades 1-2 achieved 103% of their exercise target heart rate, while these percentages were 110% and 103% for students in grades 3-4 and 5-6, respectively. Thus, it appears that the DVD-led exercise program was successful in that children can follow it without difficulties and increase heart rates.

Initially, parental permission and child assent were obtained for 349 students. Of the 213 in intervention classrooms, 8 (4%) dropped out. Of the 136 in control classrooms, 11 (8%) dropped out. Pre-test and post-test scores and their differences of all eight variables for the remaining 330 students (representing 95% of the initial sample) in the

intervention and control groups are shown in Table 2. Since the primary interest of this study was not on gender differences, presented are data for boys and girls combined. However, information is provided in the text on gender differences.

Table 2: Mean ± standard deviation of pre-test vs post-test scores and their differences for intervention and control groups by grade levels

|                          | Grade 1 - 2         |                | Grade 3 - 4         |                | Grade 5 - 6         |                | All Grades Combined  |                 |
|--------------------------|---------------------|----------------|---------------------|----------------|---------------------|----------------|----------------------|-----------------|
|                          | Intervention (n=57) | Control (n=58) | Intervention (n=79) | Control (n=38) | Intervention (n=69) | Control (n=29) | Intervention (n=205) | Control (n=125) |
| Triceps skinfolds (mm)   |                     |                |                     |                |                     |                |                      |                 |
| Pre M±SD                 | 13.9 ± 6.9          | 15.5 ± 7.6     | 16.8 ± 6.8          | 15.0 ± 5.8     | 17.2 ± 6.7          | 16.6 ± 7.1     | 16.1 ± 6.7           | 15.6 ± 6.9      |
| Post M±SD                | 14.4 ± 5.4          | 16.6 ± 7.2     | 16.3 ± 6.5          | 15.2 ± 5.1     | 17.8 ± 7.0          | 17.4 ± 8.4     | 16.3 ± 6.5           | 16.4 ± 6.9      |
| Difference M±SD          | 0.5 ± 2.2           | 1.1 ± 2.3      | -0.5 ± 2.1          | 0.2 ± 2.1      | 0.6 ± 2.3           | 0.8 ± 2.2      | 0.2 ± 2.2            | 0.8 ± 2.3       |
| Calf skinfolds (mm)      |                     |                |                     |                |                     |                |                      |                 |
| Pre M±SD                 | 13.4 ± 5.3          | 15.2 ± 7.6     | 15.2 ± 6.7          | 13.7 ± 6.1     | 17.4 ± 6.7          | 16.2 ± 6.9     | 15.5 ± 6.5           | 15.0 ± 7.1      |
| Post M±SD                | 13.2 ± 6.0          | 16.7 ± 8.6     | 15.9 ± 6.6          | 14.9 ± 6.0     | 17.8 ± 7.2          | 18.2 ± 8.2     | 15.8 ± 6.8           | 16.5 ± 7.8      |
| Difference M±SD          | -0.2 ± 3.1          | 1.5 ± 2.3      | 0.7 ± 2.9           | 1.2 ± 2.2      | 0.4 ± 2.4           | 2.0 ± 2.9      | 0.3 ± 2.8            | 1.5 ± 2.9       |
| Estimated body fat (%)   |                     |                |                     |                |                     |                |                      |                 |
| Pre M±SD                 | 21.6 ± 7.4          | 24.0 ± 10.6    | 24.8 ± 9.4          | 22.3 ± 7.7     | 26.3 ± 8.6          | 25.2 ± 9.0     | 24.4 ± 8.8           | 23.7 ± 9.4      |
| Post M±SD                | 21.7 ± 7.8          | 25.7 ± 11.1    | 25.0 ± 9.0          | 23.3 ± 7.0     | 26.9 ± 9.1          | 27.1 ± 10.7    | 24.7 ± 8.9           | 25.3 ± 10.0     |
| Difference M±SD          | 0.1 ± 2.7           | 1.7 ± 3.3      | 0.2 ± 3.0           | 1.0 ± 2.6      | 0.6 ± 2.6           | 1.9 ± 3.1      | 0.3 ± 2.8            | 1.6 ± 3.1       |
| Height (cm)              |                     |                |                     |                |                     |                |                      |                 |
| Pre M±SD                 | 124.2 ± 6.7         | 126.5 ± 7.9    | 137.8 ± 7.4         | 136.3 ± 7.8    | 148.8 ± 9.1         | 149.4 ± 8.5    | 137.7 ± 12.4         | 134.8 ± 12.1    |
| Post M±SD                | 126.6 ± 6.9         | 129.1 ± 8.1    | 140.0 ± 7.4         | 138.7 ± 8.0    | 151.4 ± 9.4         | 152.2 ± 8.8    | 140.1 ± 12.6         | 137.4 ± 12.3    |
| Difference M±SD          | 2.4 ± 0.8           | 2.6 ± 0.9      | 2.2 ± 0.8           | 2.4 ± 0.8      | 2.6 ± 1.2           | 2.8 ± 1.0      | 2.4 ± 1.0            | 2.6 ± 0.9       |
| Weight (kg)              |                     |                |                     |                |                     |                |                      |                 |
| Pre M±SD                 | 27.7 ± 8.0          | 32.0 ± 12.8    | 38.0 ± 11.3         | 35.2 ± 10.4    | 50.6 ± 17.8         | 48.4 ± 14.5    | 39.4 ± 15.9          | 36.8 ± 14.1     |
| Post M±SD                | 28.8 ± 8.7          | 33.3 ± 13.3    | 39.6 ± 11.8         | 36.7 ± 10.7    | 52.4 ± 18.0         | 50.9 ± 15.0    | 40.9 ± 16.4          | 38.4 ± 14.7     |
| Difference M±SD          | 1.1 ± 1.2           | 1.3 ± 1.2      | 1.6 ± 1.4           | 1.5 ± 2.0      | 1.8 ± 1.8           | 2.5 ± 1.7      | 1.5 ± 1.5            | 1.6 ± 1.7       |
| BMI                      |                     |                |                     |                |                     |                |                      |                 |
| Pre M±SD                 | 17.6 ± 3.7          | 19.5 ± 5.8     | 19.6 ± 4.5          | 18.6 ± 4.0     | 22.3 ± 6.4          | 21.5 ± 5.4     | 20.0 ± 5.3           | 19.7 ± 5.3      |
| Post M±SD                | 17.7 ± 3.9          | 19.3 ± 5.5     | 19.8 ± 4.5          | 18.6 ± 3.9     | 22.3 ± 6.3          | 21.7 ± 5.3     | 20.1 ± 5.3           | 19.7 ± 5.1      |
| Difference M±SD          | 0.1 ± 0.8           | -0.2 ± 1.1     | 0.2 ± 0.7           | 0.0 ± 1.1      | 0.0 ± 0.7           | 0.2 ± 1.2      | 0.1 ± 0.8            | 0.0 ± 1.1       |
| Waist Circumference (cm) |                     |                |                     |                |                     |                |                      |                 |
| Pre M±SD                 | 60.0 ± 8.4          | 64.8 ± 12.3    | 67.2 ± 11.4         | 64.2 ± 9.5     | 75.0 ± 15.1         | 72.3 ± 12.4    | 67.8 ± 13.4          | 66.4 ± 11.9     |
| Post M±SD                | 61.2 ± 9.0          | 65.5 ± 12.7    | 69.1 ± 11.5         | 66.4 ± 10.5    | 77.2 ± 15.0         | 74.2 ± 13.0    | 69.6 ± 13.7          | 67.8 ± 12.6     |
| Difference M±SD          | 1.2 ± 1.9           | 0.7 ± 2.5      | 1.9 ± 2.7           | 2.2 ± 3.3      | 2.2 ± 3.1           | 1.9 ± 3.2      | 1.8 ± 2.7            | 1.4 ± 3.0       |
| Hip Circumference (cm)   |                     |                |                     |                |                     |                |                      |                 |
| Pre M±SD                 | 69.3 ± 8.3          | 73.2 ± 11.1    | 77.4 ± 10.0         | 75.3 ± 8.7     | 87.4 ± 13.6         | 85.9 ± 10.9    | 78.5 ± 13.0          | 76.8 ± 11.5     |
| Post M±SD                | 69.9 ± 8.5          | 73.6 ± 11.5    | 78.5 ± 10.3         | 76.1 ± 8.8     | 88.3 ± 13.1         | 87.0 ± 10.8    | 79.4 ± 13.0          | 77.4 ± 11.8     |
| Difference M±SD          | 0.6 ± 2.8           | 0.4 ± 2.7      | 1.1 ± 2.5           | 0.8 ± 3.0      | 0.9 ± 3.3           | 1.1 ± 2.1      | 0.9 ± 2.8            | 0.6 ± 2.7       |

Values are means ± standard deviations. A — sign for “difference” indicates a decrease in the value from pre-test to post-test.

Table 3 presents the results of a series of two-way ANOVA analysis on the differences between the pre-test and post-test scores for treatment groups and grades of the measured and created variables using weighted least squares. As explained above, only p-values less than 0.00625 are significant at the 5% level.

The results of analyses showed that there were no significant differences in height, weight, BMI, waist circumference or hip circumference over the 14-week protocol between intervention and control groups. However, the p-values of two variables, calf skinfolds and estimated % of body fat, were significant, indicating real differences

between the intervention and control groups among grade levels ( $p < 0.05$ ). Tricep skinfolds and weight were significantly different between grade levels. These differences, however, should be expected because the students in different grades are at different levels of growth and development. There was no significant interaction between intervention and control groups or among grades for all the variables. Thus, it is evident that students in intervention group realized significantly less increase in calf skinfold measures and estimated percent body fat over the course of the study.

Table 3: Results of a series of two-way ANOVA analysis on the differences between the pre-test and post-test scores for treatment groups and grades of the measured and created variables.

|                     | Df  | Sum Sq  | Mean Sq | F Value | P         |
|---------------------|-----|---------|---------|---------|-----------|
| Tricep skinfolds    |     |         |         |         |           |
| Treatment Group     | 1   | 0.4246  | 0.4246  | 4.8181  | 0.0289    |
| Grades              | 2   | 0.9190  | 0.4595  | 5.2142  | 0.0059**  |
| Interaction         | 2   | 0.0566  | 0.0283  | 0.3210  | 0.7256    |
| Residuals           | 324 | 28.5534 | 0.0881  |         |           |
| Calf skinfolds      |     |         |         |         |           |
| Treatment Group     | 1   | 2.416   | 2.4164  | 16.5394 | 0.0001**  |
| Grades              | 2   | 0.335   | 0.1678  | 1.1481  | 0.3185    |
| Interaction         | 2   | 0.472   | 0.2358  | 1.6139  | 0.2007    |
| Residuals           | 324 | 47.337  | 0.1461  |         |           |
| Estimated body fat  |     |         |         |         |           |
| Treatment Group     | 1   | 2.197   | 2.1973  | 14.6358 | 0.0002 ** |
| Grades              | 2   | 0.483   | 0.2414  | 1.6076  | 0.2020    |
| Interaction         | 2   | 0.145   | 0.0727  | 0.4841  | 0.6169    |
| Residuals           | 324 | 48.644  | 0.1501  |         |           |
| Height              |     |         |         |         |           |
| Treatment Group     | 1   | 0.0583  | 0.0583  | 3.6978  | 0.0554    |
| Grades              | 2   | 0.0939  | 0.0470  | 2.9762  | 0.0524    |
| Interaction         | 2   | 0.0010  | 0.0005  | 0.0323  | 0.9682    |
| Residuals           | 324 | 5.1114  | 0.0158  |         |           |
| Weight              |     |         |         |         |           |
| Treatment Group     | 1   | 0.1080  | 0.1080  | 2.4007  | 0.1223    |
| Grades              | 2   | 0.8790  | 0.4395  | 9.7661  | 0.0001**  |
| Interaction         | 2   | 0.2419  | 0.1210  | 2.6873  | 0.0696    |
| Residuals           | 324 | 14.5813 | 0.0450  |         |           |
| BMI                 |     |         |         |         |           |
| Treatment Group     | 1   | 0.0043  | 0.0043  | 0.2568  | 0.6127    |
| Grades              | 2   | 0.0261  | 0.0131  | 0.7736  | 0.4622    |
| Interaction         | 2   | 0.0595  | 0.0298  | 1.7632  | 0.1731    |
| Residuals           | 324 | 5.4670  | 0.0169  |         |           |
| Waist circumference |     |         |         |         |           |
| Treatment Group     | 1   | 0.042   | 0.0420  | 0.2856  | 0.5934    |
| Grades              | 2   | 1.462   | 0.7308  | 4.9711  | 0.0075    |
| Interaction         | 2   | 0.182   | 0.0909  | 0.6184  | 0.5395    |
| Residuals           | 324 | 47.632  | 0.1470  |         |           |
| Hip circumference   |     |         |         |         |           |
| Treatment Group     | 1   | 0.006   | 0.0059  | 0.0434  | 0.8351    |
| Grades              | 2   | 0.335   | 0.1677  | 1.2328  | 0.2929    |
| Interaction         | 2   | 0.062   | 0.0311  | 0.2285  | 0.7959    |
| Residuals           | 324 | 44.076  | 0.1360  |         |           |

\*\* p < 0.05

The primary objective of this project was to investigate the feasibility of incorporating a DVD-led exercise program into the elementary school day (Table 4). Responses were received from seven teachers from intervention classrooms, and all seven (100%) agreed or strongly agreed that the children enjoyed the program, had more exercise, had more energy, and were better able to concentrate in the classroom. Four (57%) agreed that the students who exercised had fewer behavioral management problems and appeared to lose more body fat than

non-exercisers. All seven agreed that it was easy to add the DVD-led exercise program to the school day, and six (86%) agreed that they could use the DVD-led exercise program in their own classrooms without help (provided the classroom had a functioning DVD player). Teachers commented that the biggest problem with the program was that the students became bored by seeing the same DVD and hearing the same music each session, and they recommended developing more DVDs for each grade level.

Table 4: Number (percent) of teachers agreeing or strongly agreeing with the statement, out of the number responding

|   | Teachers<br>intervention<br>classrooms<br>(n = 7)<br># / # | Teachers<br>control<br>classrooms<br>(n = 5)<br># / # |
|---|--|---|
| I noticed that students who participated in the DVD-led exercise program:   |  |   |
| Got more exercise than other students.  | 7 / 7  | 2 / 4   |
| Had more energy than non-exercisers.  | 7 / 7  | 2 / 3   |
| Were better able to concentrate in the classroom than non-exercisers.   | 7 / 7  | 1 / 2   |
| Had fewer behavior-management issues than non-exercisers  | 4 / 7  | 0 / 1   |
| Appeared to lose more body fat than non-exercises   | 4 / 7  | 1 / 2   |
| Adding exercise to the school day is a good idea.   | 7 / 7  | 5 / 5   |
| It was easy to add the DVD-led exercise program to the school day.  | 7 / 7  | 0 / 2   |
| The students who participated in the exercise program seemed to enjoy it.   | 7 / 7  | 0 / 1   |
| I saw benefits for the students you participated in the exercise program.   | 7 / 7  | 0 / 1   |
| I could use this DVD-led exercise program in my own classroom with my own students without any help.  | 6 / 7  | 0 / 1   |
| I could use this DVD-led exercise program in my own classroom with my own students IF someone could help me, for example an exercise or health teacher. | 5 / 7  | 2 / 2   |

Teachers from control classrooms were surveyed as well, but surveys were returned with missing data as teachers wrote that they did not have enough information about the program and its impact on students. However, all five (100%) of the control teachers who returned surveys agreed or strongly

agreed that adding exercise to the school day is a good idea.

### **Discussion**

It appears that the DVD-led exercise program was successful in safely increasing heart rates in children to levels that should affect energy balance. Students in intervention classrooms realized significantly less increases in calf skinfold measures and estimated percent body fat. Participating teachers saw benefits for their students and felt they could implement the program in their own classrooms without assistance.

There were several limitations, however, of this study. First, students did not realize significant decreases in any measures, only smaller increases. This problem is faced by many researchers of childhood obesity, as children are growing and changing rapidly. Also seen

were significant changes in skinfolds, which are difficult to measure in children. Potential measurement error was minimized by having the same people staff the same stations at both data collection points. The individuals taking skinfold measures were both sports science professionals and experienced in skinfold measurement. Large standard deviations in all our measures were found (see Table 2). This was not surprising to the team, as students entering this school's kindergarten class in 2008 ranged from 40 pound to 120 pounds. Thus, comparisons of intervention and control students were made on change scores rather than actual measures. The exercise program was provided only for half a school year, rather than a full school year as initially envisioned, because it took longer than anticipated to complete IRB and project set-up.

Boredom with the music and routine also was noted. This could be overcome by creating a series of DVDs for use by each grade level. It is expected, however, that teachers would need some training in the DVDs and the exercise routines before they would use them. Although the teachers of intervention classrooms felt confident that they could use the DVD program in their own classrooms without assistance, in fact few joined in the exercise programs with their students. Students in our study learned the routines from college students who were very enthusiastic and motivating in their leading of the programs. Future research is needed to explore if teachers trained in the DVDs would actually follow-through to teach their students the routines and lead students in exercise 3 times a week.

## **Conclusion**

The link between obesity and cancer has been proven, as has the tendency of overweight children to become overweight adults.<sup>1-5</sup> Engaging elementary student in a vigorous physical education program can help reduce obesity in children and give children skills (and hopefully expectations) for continued physical activity throughout life.<sup>10-11</sup> This study examined the feasibility of incorporating a DVD-led exercise program with defined exercise intensity (using 60-65% of their maximum heart rate as target exercise heart rate) into the elementary school day as a means of achieving healthy body weights in elementary school children. Results indicated that such a program is feasible and promising.

## **Acknowledgement**

Supported by: 'Imi Hale—Native Hawaiian

Cancer Network at Papa Ola Lōkahi with funding from the National Cancer Institute, Center to Reduce Cancer Health Disparities (U01-CA114630) and the Hawai‘i Medical Services Association (HMSA) Foundation.

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## The Need for More Female Community Health Assistants in Yap

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### Background

There is a saying in Yap that a woman will take her cancer to the grave before baring her thighs to a man who is not her husband, especially a male relative.

One of the authors of this article, and the primary key informant, Denitha Palemar, Practical Nurse, Coordinator of the Maternal Child Health program in Yap, has worked very hard to get Trained Female Birth Attendants on each of the outer islands of Yap, and has advocated for the need to have both male and female Community Health Assistants on each island where physicians and nurse are not available, and not likely to be available soon. Mrs. Palemar was educated at University of

Guam in business and through the Fiji School of Medicine School of Public Health and has spent the last 21 years back in Yap after spending 12 years in Guam. Mrs. Palemar is also a Yap board member of Oceania Community Health. Currently she is in Oahu accompanying a patient whose situation inspired this article.

Yap, where Ulithi (one of the outer islands) as seen on maps above, is located, is known to the indigenous residents as Wa`ab, and is one state of the Federated States of Micronesia (FSM). The other states are Chuuk, Kosrae, and Pohnpei. There are about 110,000 residents of FSM, 11,000 reside in Yap. Yap is about 3800 miles southwest of Hawaii,

between Guam and Palau. FSM is sometimes confused with the region known as Micronesia (Mikro means tiny, nesia means islands). The Republic of the Marshall Islands, Palau, the Territory of Guam and the Commonwealth of the Northern Marianas as well Kiribati and Nauru are also considered part of Micronesia. This article focuses on the outer islands of Yap state.

About 7,000 of Yap's residents live on the four closely connected islands referred to as "Yap Proper." There are roads and bridges linking these islands. The land area is about 38 square miles. That island has a hospital and 3 community health centers. The other 4,000 Yapese live on the "outer" or "neighbor" islands. There are 122 outer islands with a total land mass of less than 11 square miles. 22 of these islands are populated. These islands are scattered over 100,000 square miles of ocean. Only 3 of the 22 outer islands are accessible by the one 8 passenger prop plane Pacific Missionary Airlines whose excellent pilot is also the mechanic. There is a government ship that does motor and sail to

the outer islands but a circuit may take 3 weeks to 3 months and is irregular, dependent on money for fuel, engine condition, and weather.

It is clear that transportation is a barrier to receiving health care. The 22 islands have Dispensaries that are staffed by Health Assistants, also called "HAs". HAs are specially trained to deal with health issues common on the islands, dispense antibiotics, give immunizations, treat injuries, lacerations, skin infections and wounds. All are also trained to deliver babies. Their focus however, has been on secondary and tertiary, and emergency care. One island, Mogmog has a physician, Dr. Arthur. Dr. Arthur does understand public health and described it as "race between us and disease." He stated that providers used to wait in the dispensary for illness to come to them, but now must go out and get to the healthy people to keep them well (personal communication April 2007).

The Outer Islands are still quite traditional and there are matters that are not discussed in

mixed sex groups, or in groups at all, and there are strong prohibitions regulating modesty, especially between related persons of the opposite sex. This makes it difficult for a woman to go to a male HA or for a male to go to a female HA on a small island where most folks are related,.

Females are the main caregivers, gardeners, prepare the meals, and care for the children and the elderly. There is a need for basic public health education related to water, sanitation, vector control, and infectious disease control. There is also a need for information about prompt treatment of urinary tract infections, kidney stones, and basic women's health issues.

The authors were able to assess that only one outer island, Mogmog, has a physician, that 10 Trained Birth attendants are needed, and that 14 Female Community health Assistants are needed. There are 7 islands that have no Male Health Assistant.

## Discussion

There is a health care provider shortage, particularly of women providers. Cultural traditions lead to reluctance to see providers of the opposite sex. This leads to untreated UTIs, STIs, kidney stones, bowel and bladder problems, and anything involving sexual or urinary/bowel problems is likely to be untreated, and unacknowledged.

Marie, (not her real name, but she has agreed to share her story) suffered for 2 years with UTIs and a growing mass as well as kidney stones. By the time she arrived here the doctors were gravely concerned that surgery posed a significant risk of death. Over the years the kidney had calcified, and the non-cancerous tumor which occupied most of the abdominal area, had adhered to her bowel, vena cava, and liver. She survived a nephrectomy and an eight hour surgery that had to be stopped because she was bleeding out and unstable, returned for a 2 ½ surgery the next day and is now recovering and will soon have a skin graft to complete wound

closure and will return to her island, her children, and her husband (Since this article was written she has returned home, in fact the authors were over the Pacific traveling in opposite directions on the same day. This was unexpected as we thought they would be in Oahu another 10 days.) Several other women have died from breast cancer or are living with end stage metastasis. Often there has been no pain medicine except for local medicine available and intractable pain has been suffered and documented.

### **Epidemiological transition**

Infectious diseases are still a problem ,particularly dengue, Hansen's disease, TB, STIs, and hep B. Public health has been effective, (greater than 90%), in vaccinating for measles/polio, tetanus, diphtheria, whooping cough. HPV vaccine roll out has begun on Yap proper. An increase in HTN, diabetes, kidney disease, and obesity is occurring where and when processed foods high in fat, sodium, and sugar are available. More public health

care, education and primary prevention is needed.

Cancer rates are also increasing, particularly oral cancers, but also breast and cervical.

While cancer is on the rise, particularly with more and cheaper tobacco available, death remains a subject not discussed in depth. Late diagnosis, costly and futile procedures result in separating islanders from home and family, as well as burdening them with debt after death.

### **Literacy Issues**

Women are less likely than men to finish high school. Cultural priority is on retaining mother tongue, English is added in 6<sup>th</sup> grade. Children go to larger islands for HS (Falalpop Ulithi and Falalop Woleai). In order to have more Trained Birth Attendants, Female Community Health Assistants, and Associate Degree Nurses, the focus has to be on getting women to complete high school.

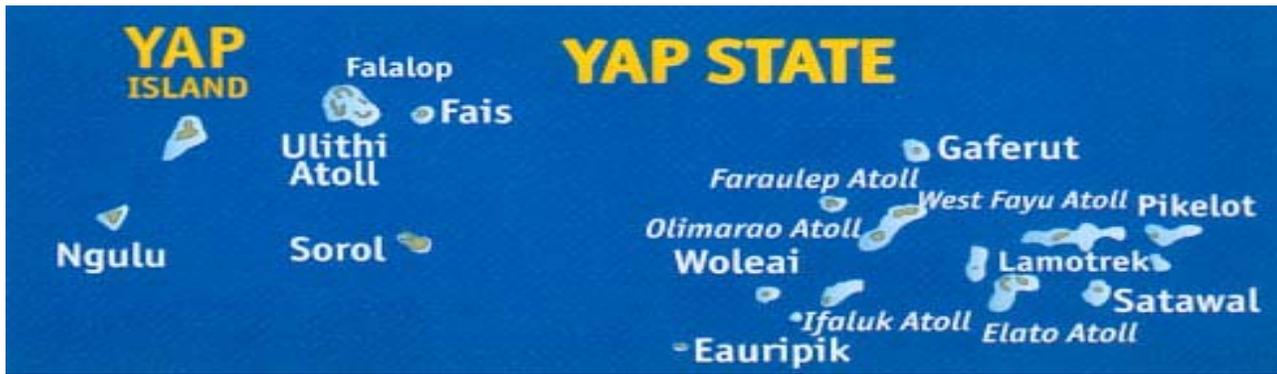
### **Recommendations**

Oceania Community Health has some planned projects which include community assessment,

and focusing on Maternal Child Health. There is an opportunity to partner with the universities in Hawaii, both University of Hawaii at Manoa, and Hawaii Pacific University. While Dr. Hancock and the other Yap physicians are willing to, and do teach the CHAs and TBAs, their practice is very busy and they already cover multiple areas. Undergraduate community health nursing students could be valuable in providing basic public health education on the outer islands. Advanced Practice RN students along with their preceptors could provide both care and education, leading to capacity building. While the islanders appreciate any education they also need certification, credits for courses taken. Perhaps partnering with the College of Micronesia school of nursing in Palau to have visiting professors of nursing from Hawaii teach courses for credit there in Yap, particularly community/public health and maternal child

health courses, could be an ongoing, sustainable, and capacity building part of the solution to the need for public health care and education, with a focus on preparing more females to fill these roles on their home islands.

Pobutsky, Buenconsuejo, Chow, Palafox and Maskarinek (2005) noted that more than “20,000 Micronesians have migrated”, and approximately 8,000 live here in Hawaii (p. 59). Whatever affects Micronesia affects Hawaii; we are the gateway state. Anything that Hawaii students, faculty, and health providers can do to improve public health in Yap, will have a positive effect here as well as there, providing learning opportunities, cultural exchange, growing respect and appreciation for the community values of Yap, while contributing to sustainable capacity building of the public health work force in Yap State.



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## Editorial

### Pharmacologic Musings

Frank Tabrah, MD

Pleased as we are with our latest treatment triumphs-- intricate instruments, magic imaging, new DNA and proteomic tools and a host of undreamed of medications, a look back at the futile content of an earlier turn of the century (1899) Merck Manual suggests that perhaps some of today's therapeutic arts may not be quite so gold plated when seen in the light of a hundred years hence. (1)

Merck's 1899 writers introduced their manual with a few thoughts on the practice of the day and what they thought might be useful to a busy physician.

*"Memory is treacherous. It is particularly so with those who have much to do and more to think of. When the best remedy is wanted to meet indications in cases that are a little out of the usual run, it is difficult...to recall the whole array of available medicines so as to pick out the best. Strange to say too, it is the most thoroughly informed man that is likely to suffer to the greatest extent in this way because his mind is overburdened. But a mere reminder is all he needs to make him at once a master of the situation and enable him to prescribe exactly what his judgment tells him is needed for the occasion... in (this) manual the physician will find a complete Ready-*

*Reference Book covering the entire eligible Materia Medica.”*

The content of this list, chosen in 1899, had a venerable history beginning with a five volume 1<sup>st</sup> century publication by Dioscorides, *Materia Medica Libri Quinque* which described over 600 plant, animal, and mineral remedies. A Chinese *Materia Medica* was published at the same time, the *Shennong Bencao Jing*, listing 365 medications. In the medieval Islamic world, Avicenna in Persia published lists of 800 purported remedies. Experimental methods were introduced in pharmacy in the late middle ages, leading to more rational approaches to treatment that spawned the arts of pharmacology. (2) Still, in 1899, much of the *Materia Medica* was simply empirical, with the

recommendations for use wanting much in pharmacologic understanding.

The 1899 *Merck Manual* was about a half a centimeter thick, displaying the indications (thought at the time to be valid) for the contents the authors chose as their *Materia Medica*.

Many of the entries, we now know, were useless or dangerous—the first protective activities of the FDA lay seven years in the future as the Pure Food and Drugs Act of 1906, followed by more rigid restrictions in 1930. Earlier interest in food and drug safety and quality actually began in 1848 in the US Patent office, where Lewis Caleb Beck carried out chemical analyses of agricultural products. Despite these efforts, food and drug safeguards at

the end of the 1800's were minimal.

(3)

The *Merck Manual* was presented in three parts--one listing the authors' selection of a *Materia Medica* that was thought to include most of the medications then in use in America, the second part, the therapeutic indications for these materials, and the third, a classification of the medications according to their physiologic actions.

Some of the purported indications are remarkable, as is seen in these few examples:

These treatment recommendations are taken verbatim from the manual:

*Hysteria*— Sodium Phosphate: by hypodermic injection, once a day for 25 days.

*Abortion*— Gold Chloride: orally, 1/50 to 1/15 gr. to avert the tendency to abort.

*Nephritis*— Arsenic: Beneficial in very chronic cases. Dose: Arsenic Bromide, 1/6 gr. per day. Albumin will return if the use of the drug be stopped. Additionally,

Lead Acetate, one to four grains.

Lessens albumen and increases the urine.

*Amenorrhea*: Manganese Dioxide: in amenorrhea of young women; in delayed menstruation, or when a period has been missed through a chill. Perseverance is required, especially in the last case.

*Anemia:* Bullock's Blood, fresh or dried, by enema and Mercury Bichloride, maximum dose, ½ gr. Daily

*Bronchitis:* 132 specifics, including: Arsenic, Oil of Eucalyptus, Potassium Cyanide, Nitric acid, Croton oil, as a liniment.

*Diabetes:* Arsenic Bromide, up to 1/6 gr. /day.

*Diphtheria:* 75 medications are listed, most local for throat symptoms as a gargle- using dilutions of acids, Boric, Carbohc, Hydrochloric, Lactic, Salicylic, and Sulphurous, among others. General internal medications for diphtheria included Mercury Oxycyanide and Bichloride, and various alkaloids. Fortunately,

diphtheria antitoxin was available, to be given hypodermically.

*Tetanus:* Recommended medications, some forty-four (antitoxin is not listed).

*Treatments for inflammation and infection include:* one hundred eleven for rheumatism, eighty-five for typhoid fever, and one hundred –fifty eight for cholera, which speak all too clearly of the hope and desperation which turn- of- the -century physicians must have felt in the face of the largely inactive, and even dangerous pharmacopoeia at their disposal.

Other interesting pharmaceutic insights of the day are found in the Materia Medica section of the manual.

Under *Arsenous Acid*, (a severely toxic enzyme poison and carcinogen), the uses listed include: Malarial fever, skin diseases, chorea, neuralgia, gastralgia, uterine disorders, diabetes, and bronchitis. Dose: 1/60 to 1/30 gr four times daily. Max. dose 1/6 gr daily.

*Aconitine* is another remarkable entry with a choice of "Potent" and "Mild." This highly active alkaloid is a powerful neurotoxin, which in either form was recommended for neuralgia, rheumatism, gout, toothache, and as a diuretic and sudorific, at doses up to 1/20 gr.

Matching in toxicity was a solution of *Ammonium Flouride*, said to be used for hypertrophy of the spleen, and in "goitre." Dose was five to twenty

minims of a solution of four grains to one ounce of water, to be kept in a gutta percha bottle because the solution readily etches glass.

*Silver Cyanide* was recommended for use in epilepsy and chorea; the dose was 1/60 to 1/20 grain in pills. This too, is an extremely powerful poison.

Finally, the remarkable listing of *Uranium Nitrate* captures our interest. At a time when radiation and diabetes were not well understood, crystals of from one to fifteen grains of Uranium Nitrate were given two or three times daily to diabetics. No suggestion of how this might work is given.

As we enjoy our deeper knowledge of physiology and pharmacology, it is

interesting to note how quickly, in the early 1900's a handful of antibiotics and vaccines and the development of a few dozen highly active medications, plus improvements in water and sewage management-- all the work of a few decades-- changed our disease patterns, longevity, and mortality. And it is truly ironic how these advances have left us, in developed countries, with the overwhelming Public Health issue of life-style disease- the "suisickness" so aptly named by Dr. Robert Rushmer in his 1975 book entitled *Humanizing Health Care*. (4)

Despite our population's hope for pill solutions for all our self-induced medical woes- prescriptions to control smoking, drinking, eating, and drug abuse-- even the plethora of modern medications on druggists'

shelves is unlikely to have much effect. The burgeoning metabolic syndrome appears to have deep psychosocial roots involving food choice, widespread obesity, and physical inactivity, unlikely targets for successful drug treatments.

Let us hope that successful Public Health attention to prevention will ultimately simplify our current *Materia Medica*—which includes roughly three thousand prescription items on the pharmacist's shelves, many of them controversial drugs for every passing symptom, for social stress, weight reduction, anxiety, and anything else that can be named for which a new nostrum can be peddled by direct company-to-patient marketing.

Today's Merck Manual of Diagnosis and Treatment ( now one of six Merck manuals) is now a 2991 page compendium of the work of a large number of editors and clinical contributors whose combined input fairly represents much of the range of medical knowledge of 2006, its publication date (5).

The weak and speculative clinical pharmacology of 1899 has become, thanks to thousands of hours of research, a very short but accurate chapter in the 2006 manual. The remainder of the volume is a detailed but practical summary of standard 2006 clinical practice. Lengthy discussions of sociomedical issues are included, such as metabolic syndrome, substance abuse, and stress disorders, now all major Public Health problems.

It will be interesting in the next hundred years to see whether the social engineering of health-care politics or major biomedical advances will have the most effect on disability and death. No doubt both will play a part, but given the dead weight of population behavior, technology seems the better bet.

Generous research funding is highly crucial for lab advances and especially the training of new researchers. In addition to bench science, we must continue to push for evidence-based clinical studies aimed at simplifying our commercially –driven *Materia Medica* and to carefully evaluate our growing roster of procedures.

After 1899, a few specifics and procedures replaced hundreds of

cherished remedies—perhaps in this century a similar winnowing may occur, fueled by economic health care issues, evidence-based treatment, and new highly specific pharmaceuticals.

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