Population Health Assessment and Evidence Based Interventions

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Community Description

Michigan was the 26th state to enter the Union on December 26th, 1837 (United States Census Bureau, 2015).  Michigan spans an area an area of 56,539.9 square miles with a population density of 174.8 persons per square mile (United States Census, 2015).  It shares a border with: Indiana, Illinois, Minnesota, Ohio and Wisconsin; As well Michigan has an international border with Canada. (United States Census, 2015).  Wayne County is the most highly populated county, with a population of 1,820,584 (United States Census Bureau, 2015).  The total population of Michigan, according to the 2010 Census, is 9,883,640 (United States Census Bureau, 2015). Table 1 gives population demographics, along with some economic and social figures for the state of Michigan.

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| ***Table 1: Demographics for Michigan, across 2000 and 2010*** | | |
|  | **2000** | **2010** |
| **Population (Total)** | 9,938,444 | 9,883,640 |
| **Age** | | |
| 0-4 years | 6.76% | 6.03% |
| 0-17 years | 19.36% | 17.68% |
| 18-64 years | 61.62%% | 62.51% |
| >65 years | 12.27% | 13.78% |
| **Gender** | | |
| Female | 50.97% | 50.95% |
| Male | 49.03% | 49.05% |
| **Race/Ethnicity** | | |
| American Indian | 0.59% | 0.63% |
| African American | 15.11% | 14.17% |
| Asian | 1.78% | 2.41% |
| Native Hawaiian/Pacific Islander | 0.03% | 0.03% |
| White | 80.15% | 78.95% |
| Another race | 1.30% | 1.49% |
| Two or more races | 1.94% | 2.33% |
| **Household Income Per Year** | | |
| < $10,000 | 4.8% | 5.0% |
| $10,000-$24,999 | 13.1% | 11.6% |
| $25,000-$49,999 | 28.1% | 24.1% |
| $50,000-$74,999 | 23.5% | 21% |
| $75,000-$99,999 | 14.2% | 15% |
| $100,000-$149,000 | 11.1% | 14.9% |
| >$150,000 | 5.2% | 8.5% |
| **Poverty Level** | | |
| Individuals below poverty level | 10.5% | 14.8% |
| **Educational Attainment (population 25 and over)** | | |
| Less than high school | 16.5% | 11.9% |
| High School Graduate | 31.3% | 31.5% |
| Some College/Associate’s degree | 30.3% | 31.5% |
| Bachelor’s degree or higher | 21.8% | 25.1% |
| **Health Insurance coverage -no data found on 2000 or 2010**  **(Civilian noninstitutionalized population)** | | **2016** |
| Health Insurance | \*\* | 90.4% |
| Private health insurance | \*\* | *69.8%* |
| Public Coverage | \*\* | *35.1%* |
| No Health Insurance | \*\* | 9.6% |
| *Sourcee: Data for Table 1 was obtained from the U.S. Census Bureau 2000 and 2010, as well as and Census Viewer and Census fact finder* | | |

Description of Table

Between the 2000 and 2010 censuses, Michigan’s population actually decreased by 0.5%, from 9.93 million to 9.88 million. This is a surprising statistic given that the overall United States population increased by 9.7% over that same time period. Overall, the population of Michigan aged a bit between 2000 and 2010, as the percentage of people children and teenagers dropped from 26.12% to 23.71%, while the percentage of people aged 18-64 increased from 61.62% to 62.51%. The largest age bracket change was found in those >65 years old – this jumped from 12.27% in the 2000 census to 13.78% in the 2010 census.

In terms of gender mix, there was almost no change between the two censuses – as the male to female mix remained about 51% female and 49% male. From a race/ethnicity point of view, there are a few differences worth noting. The most common ethnicity remains white, however the percentage of people that identify as such decreased by about 1.2% (80.15% to 78.95%). The next most common ethnicity remained African American, but the percentage also decreased (from 15.11% to 14.17%). The Asian population percentage increased the most (from 1.78% to 2.41%), while the percentage of people that identified with two or more races increased as well.

Interestingly, the % of people below the poverty level increased by about 4%, but at the same time the average household income rose from 2000 to 2010. In 2010, 23.4% of respondents cited an annual household income of $100,000 or more, compared to only 15.7% in 2000. At the same time, educational attainment increased as individuals with less than a high school degree decreased from 16.5% in 2000 to 11.9% in 2010. Furthermore, the percentage of individuals with a bachelor’s degree or higher increased from 21.8% to 25.1%.

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| --- | --- | --- | --- | --- | --- |
| *Table 2: Major causes of mortality per 100,000 people for Michigan and the U.S. across 2000 and 2010* | | | | | |
|  | **Year 2000** | | **Year 2010** | | |
|  | Michigan | USA | Michigan | | USA |
| **Age 0 – 24 years old** | | | | | |
| **#1 Cause of Death: Extreme Immaturity of Newborn (Short Gestation, Low Birth Rate)** | | | | | |
| **Overall** | 5.5 | 3.2 | 5.1 | 3.0 | |
| Male | 6.5 | 3.3 | 5.4 | 3.2 | |
| Female | 4.5 | 3.0 | 4.7 | 2.7 | |
| White | 2.8 | 2.1 | 2.9 | 2.2 | |
| Black or African American | 17.8 | 8.7 | 14.7 | 7.1 | |
| Asian or Pacific Islander | N/A | 1.9 | N/A | 2.1 | |
| American Indian | N/A | 1.9 | N/A | 1.7 | |
| **#2 Cause of Death: Assault by other and unspecified firearm discharge** | | | | | |
| **Overall** | 4.8 | 3.6 | 4.5 | 3.4 | |
| Male | 8.2 | 6.3 | 7.6 | 6 | |
| Female | 1.2 | 0.8 | 1.3 | 0.8 | |
| White | 1.0 | 1.6 | N/A | 1.4 | |
| Black or African American | 22.1 | 14.0 | 21.2 | 13.9 | |
| Asian or Pacific Islander | N/A | 1.4 | N/A | 0.7 | |
| American Indian | N/A | 2.0 | N/A | 1.9 | |
| **Age 25 – 64 years old** | | | | | |
| **#1 Cause of Death: Cardiovascular Disease** | | | | | |
| **Overall** | 41.5 | 30.4 | 43.9 | 27.8 | |
| Male | 61.1 | 45.6 | 39.5 | 42.0 | |
| Female | 21.4 | 15.5 | 29.6 | 14.0 | |
| White | 36.4 | 29.2 | 33.9 | 27.5 | |
| Black or African American | 73.2 | 46.5 | 43.6 | 38.4 | |
| Asian or Pacific Islander | N/A | 12.3 | N/A | 10.4 | |
| American Indian | N/A | 21.2 | N/A | 19.1 | |
| **#2 Cause of Death: Bronchus or Lung Cancer (malignant neoplasm)** | | | | | |
| **Overall** | 31.8 | 30.1 | 34.5 | 27.2 | |
| Male | 36.5 | 36.4 | 39.5 | 31.9 | |
| Female | 27.1 | 23.9 | 29.6 | 22.7 | |
| White | 31.3 | 30.5 | 33.9 | 28.0 | |
| Black or African American | 39.0 | 36.0 | 43.6 | 31.6 | |
| Asian or Pacific Islander | N/A | 10.1 | N/A | 10.1 | |
| American Indian | N/A | 12.6 | N/A | 13.2 | |
| **Age 65+ Years old** | | | | | |
| **#1 Cause of Death: Cardiovascular Disease** | | | | | |
| **Overall** | 907.2 | 782.0 | 662.4 | 515.4 | |
| Male | 986.9 | 868.0 | 759.5 | 598.6 | |
| Female | 851.5 | 721.8 | 588.7 | 452.3 | |
| White | 872.5 | 792.5 | 650.8 | 527.4 | |
| Black or African American | 1247.5 | 805.2 | 828.9 | 511.3 | |
| Asian or Pacific Islander | N/A | 390.9 | 115.6 | 280.7 | |
| American Indian | 536.9 | 433.3 | N/A | 302.9 | |
| **#2 Cause of Death: Bronchus or Lung Cancer (malignant neoplasm)** | | | | | |
| **Overall** | 315.8 | 314.0 | 300.8 | 280.4 | |
| Male | 439.8 | 438.2 | 375.2 | 354.4 | |
| Female | 229.4 | 227.0 | 244.5 | 224.3 | |
| White | 313.4 | 319.2 | 303.2 | 286.9 | |
| Black or African American | 342.7 | 330.2 | 302.9 | 279.7 | |
| Asian or Pacific Islander | N/A | 158.8 | N/A | 143.9 | |
| American Indian | 590.6 | 184.7 | 367.8 | 197.9 | |
| *Note:Rate Per 100,000*  *Source: Data for table 2 was obtained from the CDC and Michigan Department of Community Health* | | | | | |

https://wonder.cdc.gov/controller/saved/D76/D22F064

**Description of the table**

Cardiovascular disease (CVD) is far and away the leading cause of death amongst adults in both Michigan and the broader United States. Individuals become much more susceptible to this illness as they grow older. Table 2 compares average mortality rates per 100,000 people in both the year 2000 and 2010. It shows that while the risk of cardiovascular disease is still prevalent in those aged 25-64, it becomes a major concern in the elder population (aged 65+). For instance, in the US in 2010, about 28 people out every 100,000 Americans aged 25-64 years old died from cardiovascular disease. This number jumps to 515 deaths out of every 100,000 Americans when you focus in on the 65+ year old age group – an increase of over 1700%. The second leading cause of death in Americans aged 25 and older is lung cancer. Similar to cardiovascular disease, lung cancer is prevalent in the middle-age bracket, but the mortality rates significantly increase in the elder population.

The state of Michigan actually has higher mortality rates than the broader United States across the major causes of death for each age bracket. For instance, 662 out of every 100,000 Michigan residents aged 65+ died from cardiovascular disease in 2010, compared to 515 out of every 100,000 Americans. In looking at data for lung cancer, again Michigan suffers higher mortality rates than the broader United States. Breaking the data down by gender shows that males are much more susceptible to both cardiovascular disease and lung cancer than females. This remains true regardless if you look at the data for the United States or Michigan.

In looking at a breakdown of mortality rates by race, the data highlights a major difference between Michigan and the United States. Across the US, White people and African Americans have approximately the same mortality rates for cardiovascular disease in the elder population (aged 65+). However, when you look at Michigan data only, African Americans have much higher mortality rates – 829 out of every 100,000 African Americans in Michigan died in 2010 from CVD, while only 650 out of every 100,000 White people in Michigan died. The data suggests that perhaps some sort of health inequality exists between white people and African Americans in the state of Michigan. An example of a possible health inequality would be if African Americans have less access to quality healthcare services, for whatever reason. Lastly, another interesting finding is that the American Indian and Asian populations have significantly lower mortality rates for cardiovascular disease and lung cancer.

**Evidence-Based Practice Strategy**

Given the high mortality rates associated with cardiovascular disease, I decided to address this disease in the 65+ year old age group with an evidence-based strategy. What I find most interesting about cardiovascular disease is that many of the risk factors that increase one’s chances of getting the disease are controllable and tend to start early on in one’s life. For instance, smoking and an unhealthy diet are two of the leading risk factors for CVD, and are totally within the individual’s control. Having just one risk factor can double one’s risk for CVD, while two risk factors will increase one’s risk for CVD by a factor of four (Source: https://www.nhlbi.nih.gov/health/health-topics/topics/hdw/atrisk). Therefore, there is a lot of opportunity to help control the prevalence of this disease through both individual and community-level strategies. The growth in cardiovascular disease mortality rates we’ve seen over time (see table 2) will likely continue unless we can take action to minimize these risks.

An example of an individual-level intervention to reduce risk of cardiovascular disease is the use of self-measured blood pressure monitoring systems. Under this strategy patients are trained on how to use various blood pressure devices and are instructed to use them on a regular basis from the comfort of their own home. The data from these measurements is then shared the patients’ healthcare providers (via phone call, email, etc.) and is continually monitored to help determine optimal treatment programs. Studies found three positive blood pressure outcomes: increase in propotion of patients with blood pressure at target level, overall reduction in average systolic blood pressure, and reduction in diastolic blood pressure. From an economic point of view, though there was not enough evidence to determine cost-effectiveness of these interventions, studies did show that the averted cost of medication and outpatient visits were greater than the cost of the intervention.

One evidence based strategy at the community level that has been suggested to help alleviate the risk of cardiovascular disease is interventions that engage community health workers in efforts to prevent the onset of the disease. These interventions engage community health workers to reduce risk by providing disease education, offering social support and informal counseling, helping to connect individuals with necessary services, and even providing blood pressure screenings and providing other minor health services. Community health workers serve as a liaison between broader healthcare system, and thus have a good understanding of the community and the type of support that they need. These health workers ensure that individuals get necessary support and help them navigate the complexities of the medical system. Studies showed that among populations at increased risk for cardiovascular disease, interventions in which community health workers partnered with patients and licensed providers to improve coordination of care led to large improvements in blood pressure and cholesterol outcomes. Other interventions in which community health workers helped educate, inform, and enroll patients in necessary services led to moderate improvements in health behavior outcomes. These studies also showed that community health workers can play a pivotal role in reducing health disparities within underserved groups.

[Insert application and conclusion paragraph]

Source:

https://www.thecommunityguide.org/findings/cardiovascular-disease-self-measured-blood-pressure-when-used-alone

https://www.thecommunityguide.org/findings/cardiovascular-disease-prevention-and-control-interventions-engaging-community-health

Healthy

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