Non-Communicable Diseases:
Challenges and Opportunities of Addressing Social Influences on Health

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Challenge #1: Our Larger Culture

- We now live in a culture that encourages and rewards unhealthy behaviors
- To live healthy, is to swim against the tide
- Even the best off in contemporary societies are less healthy than they could or should be
- All of us could be doing better in terms of health
- In the U.S., for the 1st time in history, the next generation will live sicker and shorter lives than their parents
- We need to find ways to create a new culture of health in which we make healthier choices easier

Chronic Disease: Byproducts of Social Progress

Inactivity & unhealthy diets reflect changes in social and economic conditions:

- More job opportunities for women
- More food consumption away from home
- Rising costs of healthy food
- Declining prices of unhealthy food
- Decreased activity: occupational and environmental
- Unhealthy choices and lifestyles appear incentivized and economically smarter

Yach et al, Nature Med, 2006;

An Uphill Task: Increasing Activity

- More people with sedentary jobs
- Energy-saving devices that decrease activity
- Fewer people biking
- Fewer people walking to work and elsewhere
- Fewer people engaged in leisure time activity
- TV, computers, central air and heat have increased appeal for indoor activity
- Physical activity eliminated in schools
- Real and perceived danger of outdoor activities in some neighborhoods

Yach et al, Nature Med, 2006;

An Uphill Task: Healthy Eating

- Increased access to good-tasting, inexpensive food that requires little or no preparation
- $33 Billion spent annually to promote high calorie, high sugar, high fat foods
- Advertising promotes taste, accessibility, convenience and cost of unhealthy foods
- Unhealthy foods ubiquitous: restaurants, convenience stores, vending machines, gas stations, bookstores, museums, and even hospitals
- Healthy foods: more prep. & cost, perishable

Wyatt et al, Am J Med Sci, 2006;

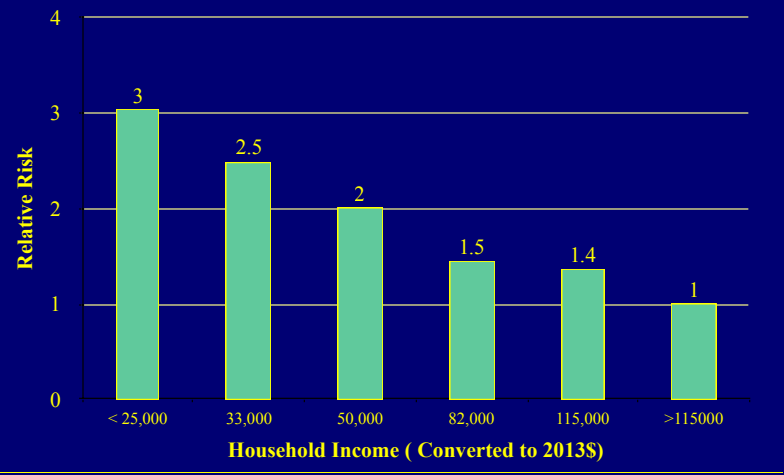
Opportunity: Making Healthier Choices Easier

- Provide on-going professional development to train clergy to model healthy eating, sleeping and physical activity behaviors
- How do we re-design our work routines, buildings, campuses, to promote exercise
- How do we foster healthier eating at every church potluck, in every cafeteria
- How do we promote healthier eating by supporting community gardens, drinking water instead of juice, hosting more youth events that encourage healthy lifestyles
- When will we adopt formal church policies related to healthy eating and physical activity?

Challenge #2: Social Inequalities in Health

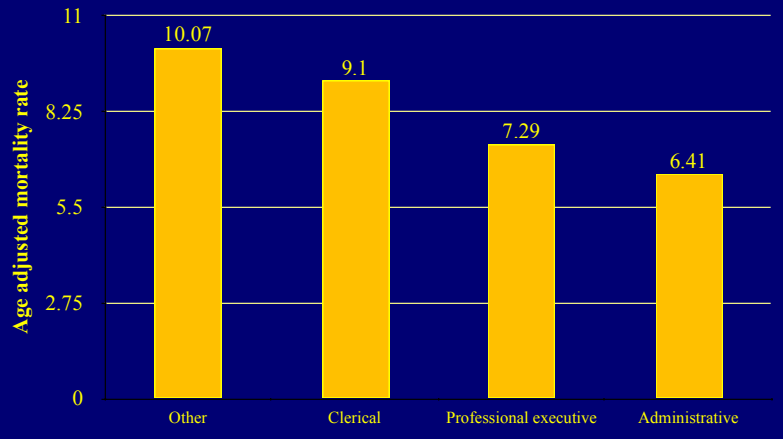
- Health is not evenly distributed in our societies
- In virtually every country, your social and economic standing says a lot about how long and how well you live
- In many societies, your zip code or your postal code is a stronger determinant of your health than your genetic code
- In race-conscious societies, racially or ethnically stigmatized groups have worse health than the rest of the populations

Relative Risks of All-Cause Mortality by Household Income Level: U.S. Panel Study of Income Dynamics



P. McDonough, Duncan, Williams, & House, AJPH, 1997

Employment grade and Heart Disease Mortality
25 year follow up of the Whitehall study (U.K.)



van Rossum, Shipley, van de Mheen, et al., J Epi Community Health 2000;

Low SES: Multiple Disadvantages

- Poor education in childhood and adolescence
- Insecure employment or unemployment
- Stuck in hazardous or dead-end jobs
- Living in poor housing
- Living in neighborhoods with fewer resources
- Trying to raise a family in difficult circumstances
- Living on an inadequate pension
- Eat poorly, forgo exercise, skip medications

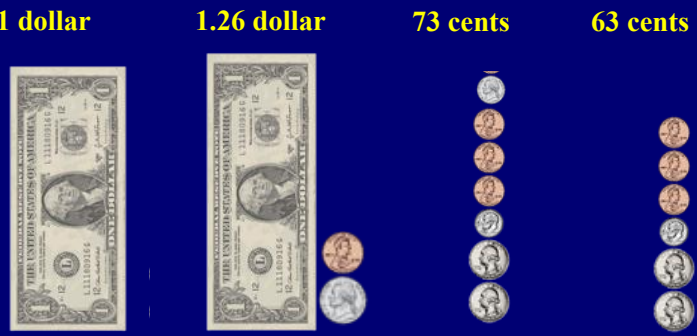
WHO: The Solid Facts

Socioeconomic Status is strongly associated with Race and Ethnicity:

Illustration with Data from the U.S.

Median Household Income and Race, 2009

Racial Differences in Income are Substantial:



U.S. Census Statistical Abstracts. 2012. Table 691

Median Wealth and Race, 2007

- For every dollar of wealth that Whites have,

Blacks and Latinos have only 6 cents

- If we exclude home equity, and only look at other financial assets, Blacks and Latinos have one penny for every dollar of financial wealth that Whites have.

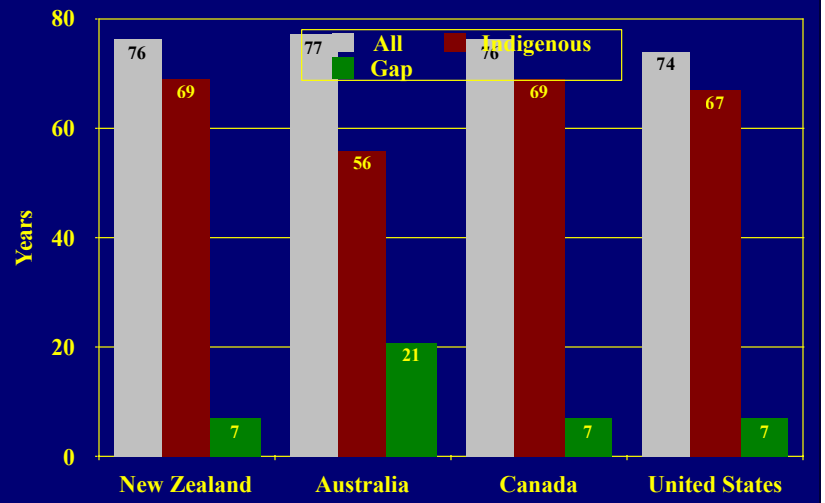
Wolff.2010

A Global Phenomenon

There are large racial differences in health in societies, such as,

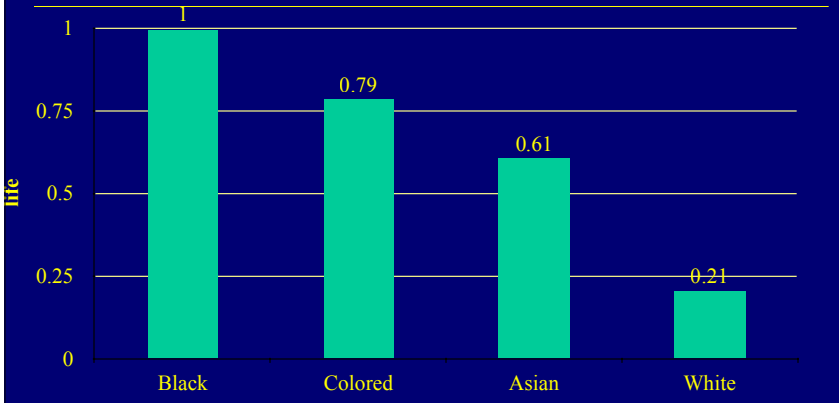
- Australia
- Brazil
- New Zealand
- South Africa
- the U.K.
- United States,

Life Expectancy, Indigenous Men



Maori, Aboriginal, First Nation, Am Indian & Alaskan Native; Bramley et al. 2004

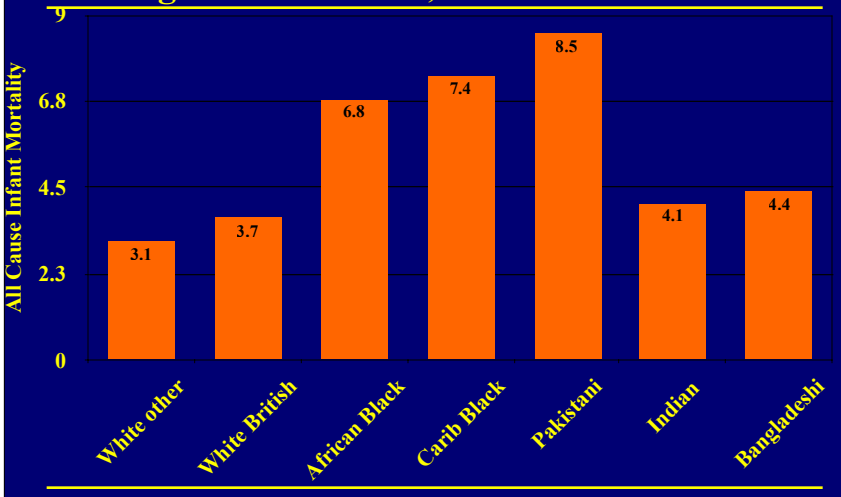
Infant Mortality by Race, South Africa



Estimates adjusted for demographic variables, SES, children born to the same mother.

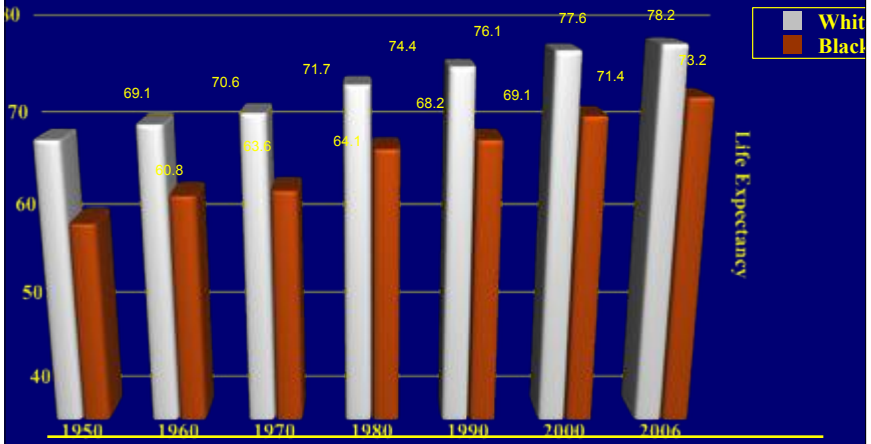
S.A. Burgard, D.J. Treiman, Social Science & Medicine 62 (2006) 1126–1137

Infant Mortality by Ethnicity England and Wales, 2011 Birth Cohort



Deaths per 1,000 live births, known gestational age, Office for National Statistics, 2013

Life Expectancy Lags, 1950-2006



NCHS, Health United States, 2010

Opportunity: Addressing Social Inequality

- A Comprehensive Health Ministry must attend to the health needs of all in society but must also give explicit attention to the needs of those who face the largest shortfalls in health
- Attending to the underlying socioeconomic challenges of vulnerable populations must be a core part of effective health outreach
- To help to close the socioeconomic and racial/ethnic gaps in health, we need to develop strategies that improve the health of the most vulnerable more rapidly than the rest of the population

Challenge #3: Stress & Social Conditions

- Comprehensive health ministry must include the provision of accurate health education, but if it is going to be effective, it must do more
- It must be involved in reducing the underlying barriers and triggers of unhealthy practices
- It must understand and address the forces that give rise to health behaviors in the first place, the role that behaviors play in helping people cope with the stressors of life and offer healthier alternatives
- Stress is an epidemic in our modern societies

Science Tells Us that Early Life Experiences Are Built Into Our Bodies

Relationships are the "Active Ingredients" of Early Experience

- Nurturing and responsive relationships build healthy brain architecture that provides a strong foundation for learning, behavior, and health.
- When protective relationships are not provided, elevated levels of stress hormones (e.g., cortisol) disrupt brain architecture by impairing cell growth and interfering with the formation of healthy neural circuits.

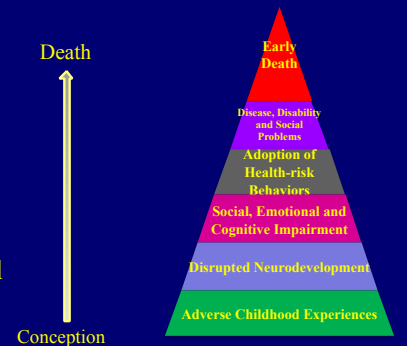
Toxic Stress

- Strong and prolonged activation of the body's stress management systems in the absence of the buffering protection of adult support.
- Precipitants include extreme poverty, physical or emotional abuse, chronic neglect, severe maternal depression, substance abuse, or family violence.
- Disrupts brain architecture and leads to stress management systems that respond at relatively lower thresholds, thereby increasing the risk of stress-related physical and mental illness.

Adverse Childhood Events: A *Hidden* Driver of Health

ACE Score = 1 point each for positive responses to 10 questions about exposure to:

- Physical abuse
- Emotional abuse
- Sexual abuse
- Physical neglect
- Emotional neglect
- Divorce/separation
- Domestic violence in home
- Parent used drugs or alcohol
- Parent incarcerated
- Parent mentally ill



Mechanisms by which ACEs Influence Health and Well-being throughout the Lifespan

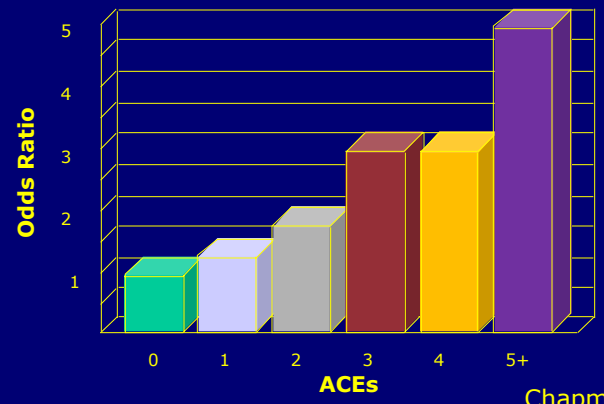
Adverse Childhood Experiences Study website: www.acestudy.org

Childhood Adversities

Abuse Category	Percent
Psychological	11
Physical	12
Sexual	22
Substance Abuse	26
Mental Illness	19
Mother treated violently	13
Incarceration of Household Member	3
Any Abuse	52

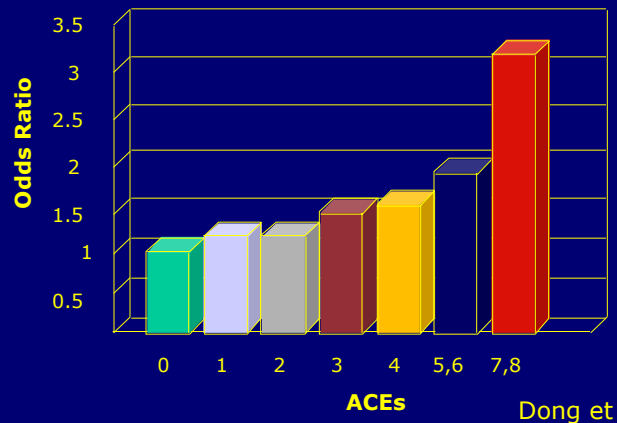
Source: Feletti et al. 1998 N=9,508 Adults

Risk Factors for Adult Depression are Embedded in Adverse Childhood Experiences



Chapman et al, 2004

Risk Factors for Adult Heart Disease are Embedded in Adverse Childhood Experiences



Dong et al, 2004

Opportunity: Addressing Early Adversity

- The foundation of good health in adulthood is built in childhood
- Adult chronic illnesses begin very early in life
- Given the prevalence of early adversity, a Comprehensive Health Ministry must find innovative ways to provide parenting education and enhance the skills and supports of parents
- Supportive parenting protects the brain and improves health
- But it must do more: How can we improve the health of children by improving the lives (educational & occupational skills) of parents?

Blueprint Advice

"Attention should be given to the establishment of various industries so that poor families can find employment. Carpenters, blacksmiths, and indeed everyone who understands some line of useful labor should feel a real responsibility to teach and help the ignorant and the unemployed."

MH, page 194

Blueprint Advice -II

"By instruction in practical lines, we can often help the poor most effectively. As a rule, those who have not been trained to work, do not have habits of industry, perseverance, economy, and self denial. They do not know how to manage. Often, through lack of carefulness and right judgment, there is wasted that which would maintain their families in decency and comfort, if it were carefully and economically used." (MH, page 194-195)

Importance of Stress in responding to Smoking

Tobacco

- Worldwide, 5 million die from tobacco each year
- In U.S., tobacco accounts for ~500,00 deaths annually
- Tobacco causes 1 in 5 deaths in the US
- Despite declines in cigarette use, smoking is still the single most preventable cause of death
- Smoking causes more deaths than overweight and obesity, high cholesterol, alcohol, and the low intake of fruits and vegetables combined

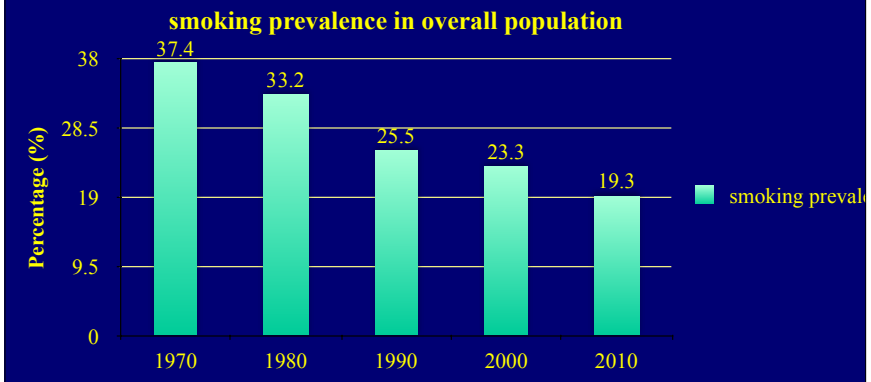
Danaei et al. PLOS Med 2009; Gruer et al BMJ 2009;

Lung Cancer

- The number one cause of cancer deaths in the US and worldwide
- Still a very common cancer globally
- Lung cancer is responsible for 80% of all deaths from tobacco-related illnesses
- Kills more Americans annually than breast, prostate, colon and pancreatic cancer combined!

Thun et al JNCI 2006; BWH 2010; ACS Facts & Figures 2009

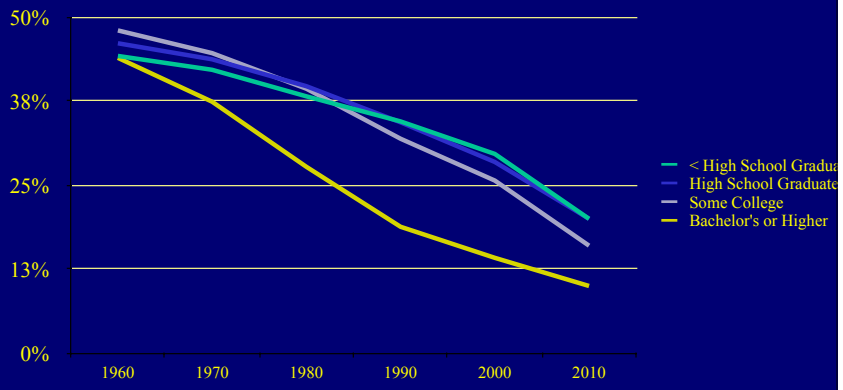
Smoking Levels in the U.S., 1970 -2010



18 years of age and older

Centers for Disease Control and Prevention. National Center for Health Statistics. National Health Interview Survey 1965-2011

Smoking prevalence in the U.S 1960 -2010 by Education

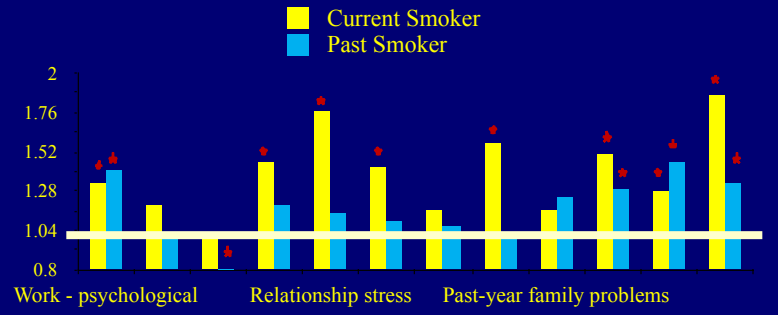


Smoking Rates Among Individuals Ages 25 and Older, by Education Level, 1960–2010

Source: National Center for Health Statistics, 2009,

Psychosocial Stress and Odds of Current & Previous Smoking

Multinomial models estimated independently; Reference Group = Never smokers



*p<.05

Continuous stress z-scores ; adjusted for age, gender, education, & income.
Slopen, Dutra, Williams, Mujahid, Lewis, Bennett, Ryff, Albert, Nic & Tobacco Res, 2012

Importance of Stress in responding to Obesity

Chronic Stress Heightens Vulnerability to Diet-Related Metabolic Risk

- Case-control study of women high and low on chronic stress
- Highly stressed people who eat a lot of high-fat, high-sugar food are more prone to health risks than low-stress people who eat the same amount of unhealthy food.
- Measures: insulin sensitivity, waist circum. plasma NPY and markers of oxidative stress.
- Stress activates peripheral mechanisms in fat tissue that augments negative effects of sugar and fat on visceral tissue accumulation

Aschbacher, K. et al., (2014). *Psychoneuroendocrinology,46*, 14-22.

Chronic Stress, Calories & Health

" Many people think a calorie is a calorie, but [this] recent study suggests that two women who eat the same thing could have different metabolic responses based on their level of stress". Kirsten Aschbacher, PhD

- We now know that stress alters energy homeostasis
- Chronic stress and bad diet: effect on waist circumference synergistic

Aschbacher, K. et al, (2014). *Psychoneuroendocrinology,46*, 14-22.

Importance of Stress in creating Racial inequalities in health

Every Day Discrimination

In your day-to-day life how often have any of the following things happened to you?

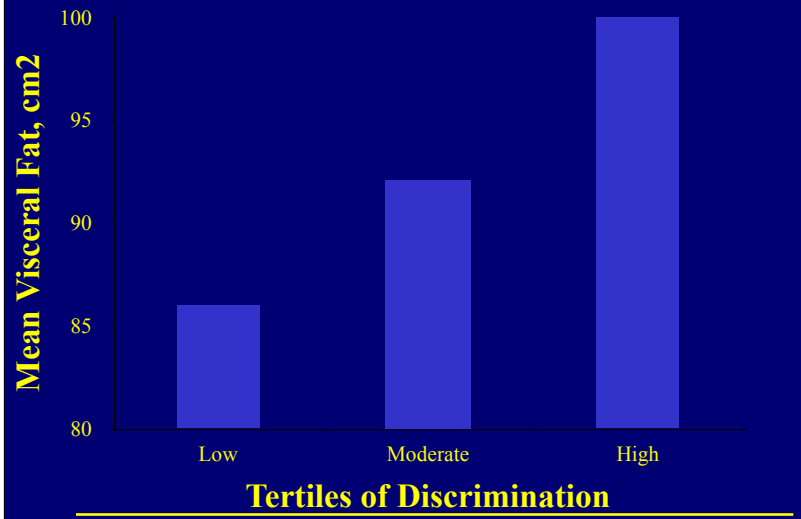
- You are treated with less courtesy than other people.
- You are treated with less respect than other people.
- You receive poorer service than other people at restaurants or stores.
- People act as if they think you are not smart.
- People act as if they are afraid of you.
- People act as if they think you are dishonest.
- People act as if they're better than you are.
- You are called names or insulted.
- You are threatened or harassed.

What do you think was the main reason for these experiences?

Williams et al., J Health Psychology, 1997

- Everyday Discrimination: positively associated with:
  - -- coronary artery calcification (Lewis et al., Psy Med, 2006)
  - -- C-reactive protein (Lewis et al., Brain Beh Immunity, 2010)
  - -- blood pressure (Lewis et al., J Gerontology: Bio Sci & Med Sci 2009)
  - -- lower birth weight (Earnshaw et al., Ann Beh Med, 2013)
  - -- cognitive impairment (Barnes et al., 2012)
  - -- poor sleep [object. & subject.] (Lewis et al, Hlth Psy, 2012)
  - -- mortality (Barnes et al., J Gerontology: Bio Sci & Med Sci, 2008).
  - -- visceral fat (Lewis et al., Am J Epidemiology, 2011)

Discrimination & Visceral Fat



Lewis et al. Am J Epidemiology, 2011

Opportunity: Stress Interventions

- A Comprehensive Health Ministry must address the stressors in people's lives and design programs that reduce modifiable individual and community-level stressors, and enhance individual & community-level resources to cope with stressors
- This applies to
  - Smoking cessation programs
  - Weight Reduction Programs
  - Marriage & Parenting Classes
  - -The broad range of health education and prevention programs

Challenge #4: Co-morbidity: Mental & Physical

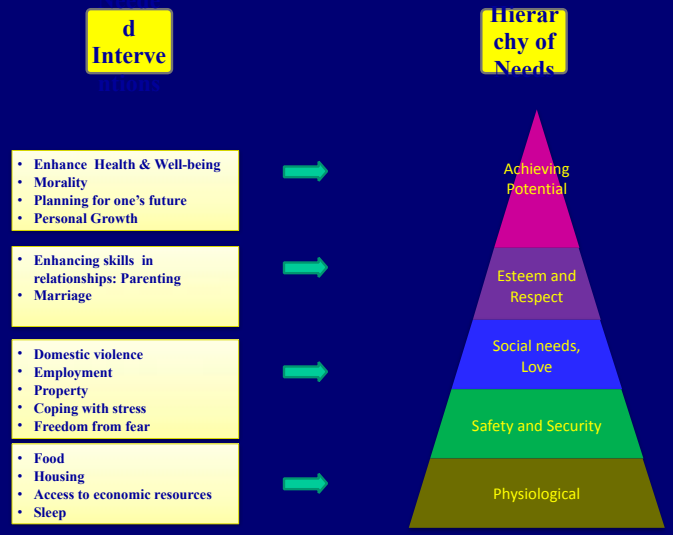
- Co-occurrence of depression with chronic diseases like CHD, diabetes and hypertension
- Depression more disabling than angina, arthritis, asthma and diabetes (Chatterji et al. Lancet 2007)
- Depressed diabetes patients have lower levels of glycemic control (Papelbaum et al., 2011)
- Addressing depressive symptoms in patients with chronic disease can enhance adherence and reduce the severity and course of illness
- It is possible to identify people at high risk of depression and prevent new cases among them

(Muñoz et al, Ann Rev Clin Psychology 2010)

The Logic of Prevention

- Most major chronic diseases amenable to prevention
- Almost 40% of U.S. deaths attributed to 4 behaviors:
  - Smoking, poor diet, inactivity, alcohol
- Weight loss and exercise can curb the progression of diabetes by 50%
- By limiting the increase in chronic diseases prevention can reduce healthcare costs and contribute to a healthier workplace.

S. Woolf, JAMA 2003



Meet lower level basic needs so that higher level needs can be in focus

Myth

The medical work is the right arm of the gospel message

Fact

Gospel medical work is the right arm of the message

Medical missionary work is the right arm of the message

Care that Addresses the Social context

Why treat illness and send people back to live in the same social, physical and psychological conditions that made them sick in the first place?

Service Delivery and Social Context

•244 low-income hypertensive patients, 80% black (matched on age, race, gender, & BP history) randomly assigned to:

- Routine Care: Routine hypertensive care by physician
- Health Education Intervention: Routine care, plus weekly meeting for 12 weeks with health professional
- Outreach Intervention: Routine care, plus home visits by lay health workers*. Provided info on hypertension, discussed family difficulties, financial strain, employment opportunities, and, as appropriate, provided support, advice, referral, and direct assistance.
- *Recruited from the local community, one month of training to address social and medical needs of persons with hypertension.

Syme et al. 1978

Service Delivery and Social Context: Results

Seven months later, patients in the outreach group:

1. Were more likely to have their blood pressure controlled than patients in the other two groups.
2. Knew twice as much about blood pressure as patients in the other two groups. Those in outreach group with more knowledge were more successful in BP control.
3. Were more compliant with taking their BP medication than patients in the health education group. Moreover, good compliers in the outreach group were twice as successful at controlling their blood pressure as good compliers in the health education group.

Syme et al. 1978

What would a Comprehensive Health Ministry look like?

Our Marching Orders

Is this not the fast which I choose, To loosen the bonds of wickedness, To undo the bands of the yoke, And to let the oppressed go free, And break every yoke?

Is it not to divide your bread with the hungry, And bring the homeless poor into the house; When you see the naked, to cover him; And not to hide yourself from your own flesh?

… And if you give yourself to the hungry, And satisfy the desire of the afflicted,

Then your light will rise in darkness, And your gloom will become like midday And the LORD will continually guide you, And satisfy your desire in scorched places, and give strength to your bones; And you will be like a watered garden, And like a spring of water whose waters do not fail.

Isaiah 58: 6-11 NASB

The Only Key To Success

"Christ's methods alone will give true success in reaching the people:

- The Savior mingled
- as one who desired their good
- He showed His sympathy
- ministered to their needs, and
- won their confidence.
- Then He bade them, 'Follow Me.'" MH 143

What would a Comprehensive Health Ministry Really look like?

A brief walk down memory lane

The Chicago Mission: A 19th c. Model

In 1893, the General Conference set up the Seventh Day Adventists' Medical Missionary and Benevolent Association to operate a special outreach in Chicago.

Dr. John Harvey Kellogg was made the president of the association.

The Blueprint

In 1885, Mrs. White wrote a long article on city missions (5T).

In 1894, Mrs. White wrote a series of articles in the Review and Herald on "our duty to the poor and afflicted" to endorse the missions' involvement.

Dr. Kellogg indicated that these articles and other writings by Mrs. White were the blueprint for his Chicago medical mission.

The Chicago Mission: Programs

The Chicago Medical Mission begins in 1893. It offered:

- A free medical dispensary
- A clothing distribution program
- A homeless shelter (400 persons per night)
- Work at shelter: rug, carpet weaving, or broom making
- Soup Kitchen (500 to 1,500 fed per day)
- Lifeboat Rescue Home (halfway house for prostitutes)
- Maternity Home (for unwed mothers)
- Farm outside of the city: drug rehab & homeless
- a school for Chinese
- a visiting nurse service

Medical School

- In the summer of 1895, the American Medical Missionary College started with 40 students
- A 4-year course of studies: initial classes in Battle Creek and the last third of the work (clinical experience), in Chicago
- Only nominal tuition charged; students could earn room and board by working 2 or 3 hours a day at the Sanitarium.
- The college graduated over 200 physicians during its 15 years

Med School Settlement House Programs

- Dormitory for medical students while in Chicago.
- Home base for 8 visiting nurses who worked in the low-income residential area surrounding the building

It sponsored many other activities including:

- a kindergarten,
- a day nursery for working mothers,
- a free laundry for women,
- Classes in first aid, hygiene, diet, child training, dress,
- Operated a free employment agency
- A placement service for orphans
- A placement service for men and women who had been reclaimed from skid row.

Medical Training

The clinical experience of the medical students included:

- working in the dispensary
- organizing over 70 clubs among newsboys, bootblacks, and street kids
- a visitation program to the city's jails that included classes in gymnastics and moral instruction.

Unique, Comprehensive Ministry

The S.D.A. medical school in Chicago was called, "the most important educational institution in the world.“

Dr. Stephen Smith, founder of the American Public Health Association

The coordination of the study of medicine with the operation of numerous welfare programs was unique

But My Church is too Small

“The medical missionary work should be part of the work of every church in our land." (6T, 289)

"In every city where we have a church, there is need of a place where treatments can be given." (6T, 113)

"Every church should be a training school for Christian workers. Its members should be taught how to give Bible readings, how to conduct and teach classes, how best to help the poor, and to care for the sick, how to work for the unconverted." (MH, p. 149)

Our Example

"The Word became flesh and blood,
and moved into the neighborhood.
We saw the glory with our own eyes,
the one-of-a-kind glory,
like Father, like Son,
Generous inside and out,
true from start to finish." John 1:14 Message

The epidemic of Chronic non-communicable diseases and social factors that contribute to it can be effectively addressed by a comprehensive and compassionate health ministry.