Health Disparities: Determinants, Mechanisms, and Action

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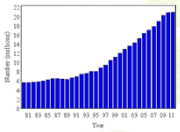
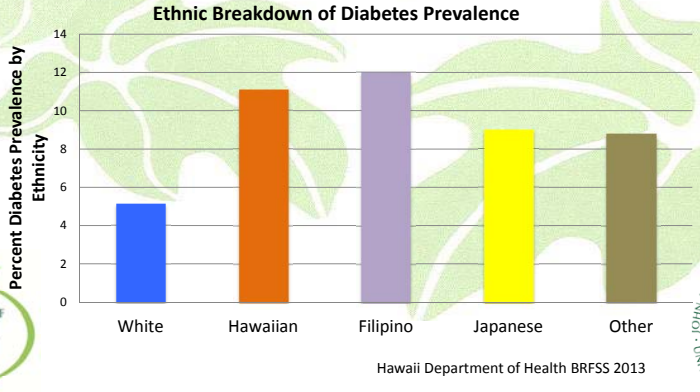
Educate, Discover, Heal and Engage

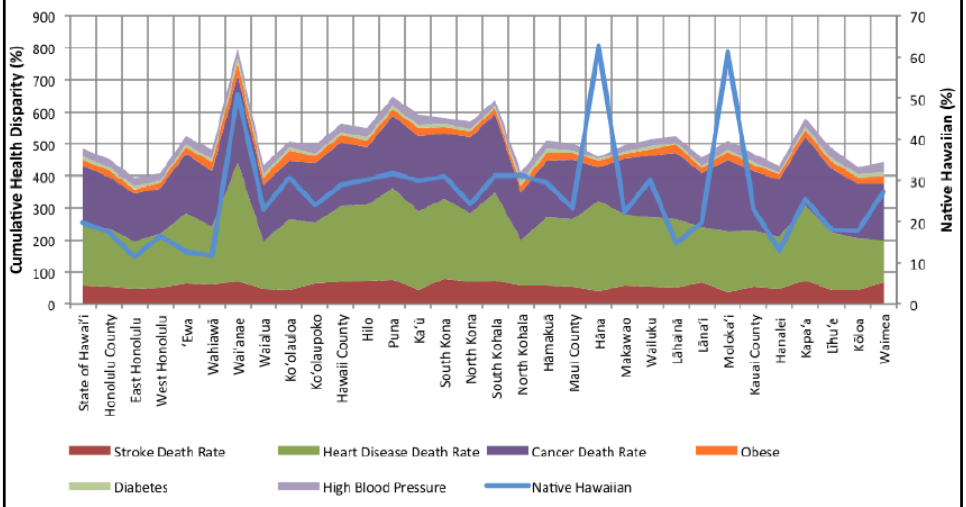
Diabetes Disparity in Hawai'i

- T2DM prevalence tripled in last 30 years [CDC 2011]
- 9.3% prevalence in US [ADA 2012]
- 8.4% prevalence in State of Hawai'i [Hawaii BRFSS 2013]
- 7.9% to 8.4% increase in diabetes prevalence from 2005-2013 [Huakai 2014]



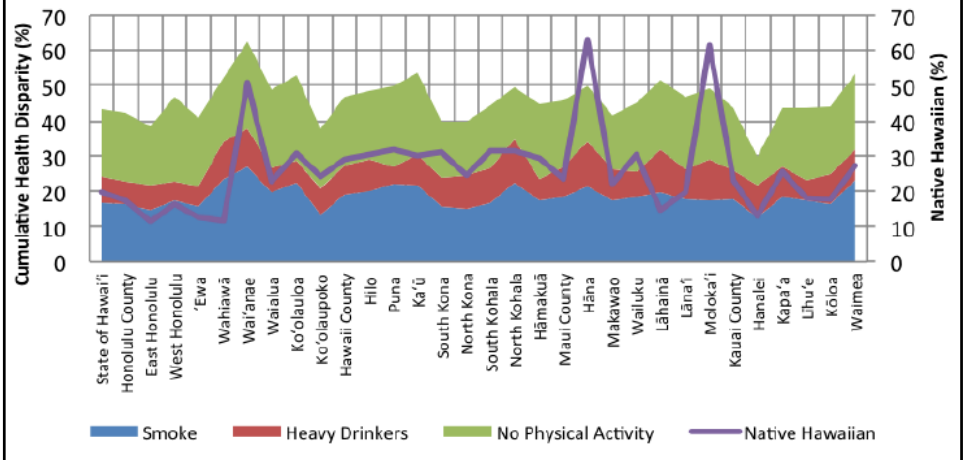


Regional and Population Health Disparities



http://www2.jabsom.hawaii.edu/native/comm_ulu-

Behavioral Risk Factors



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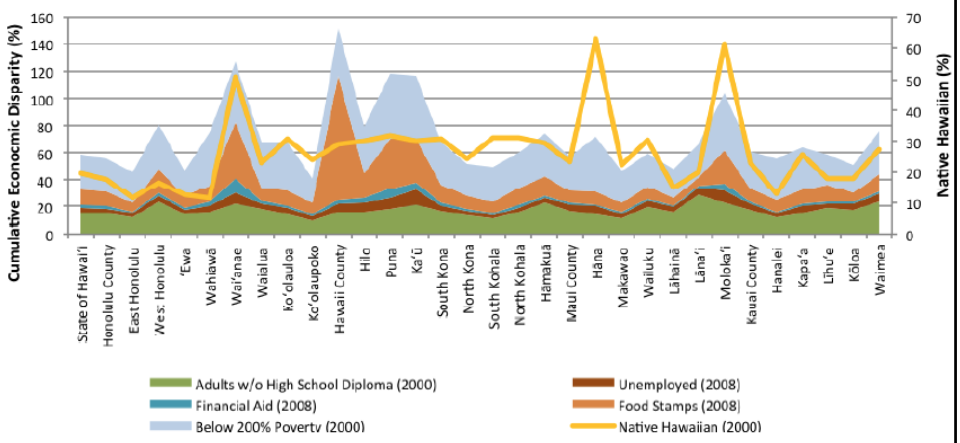
Social-Economic & Education Disparity



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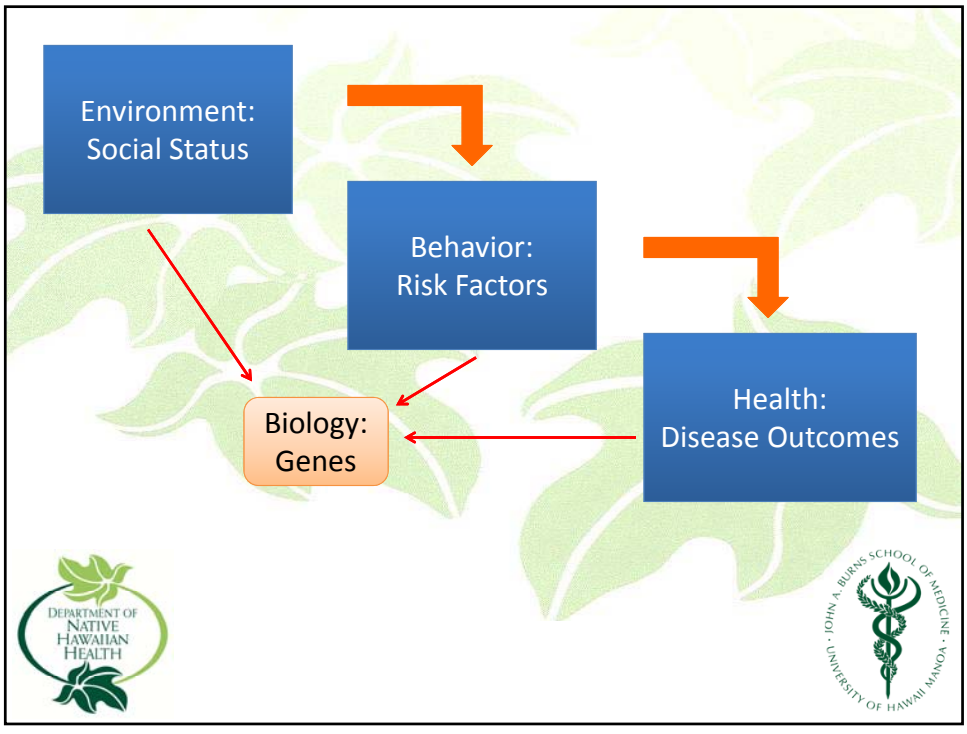
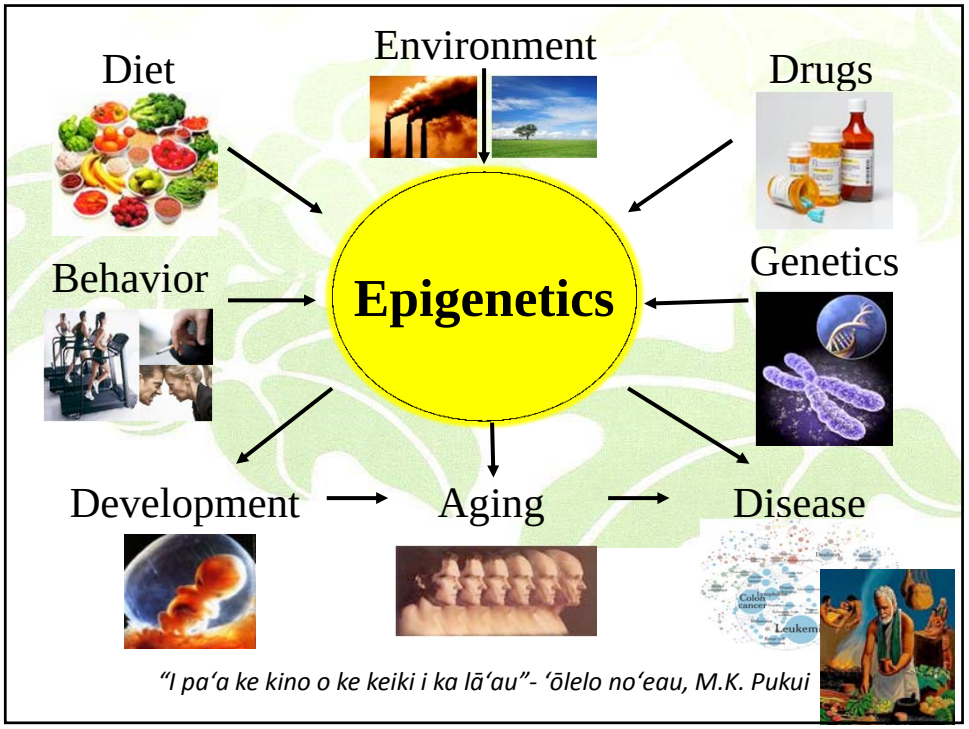
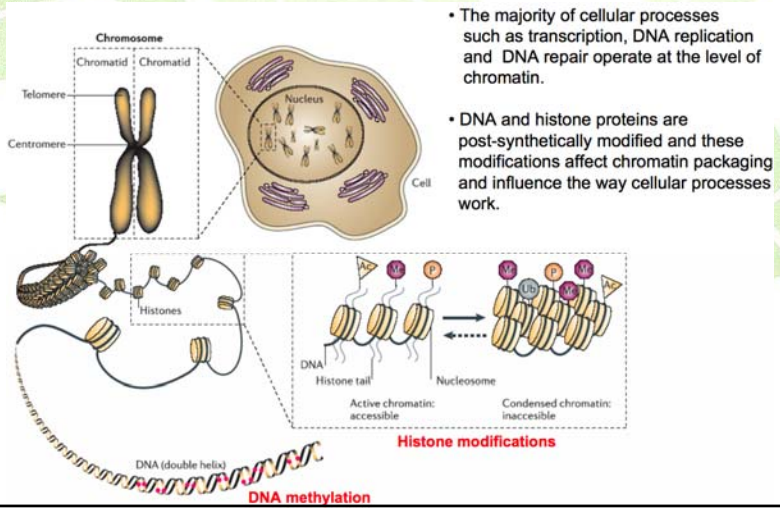




Gene-Environment

- **Epigenetics:** Study of *heritable* changes in phenotype *not* due to changes in the underlying DNA sequence.

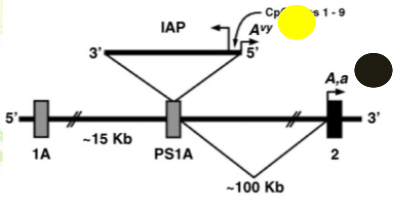


- The majority of cellular processes such as transcription, DNA replication and DNA repair operate at the level of chromatin.
- DNA and histone proteins are post-synthetically modified and these modifications affect chromatin packaging and influence the way cellular processes work.

Examples of Epigenetic Inheritance

- Agouti viable yellow (A^{vy}) allele

Reviewed in: The case for transgenerational epigenetic inheritance in humans. Morgan & Whitelaw. Mamm Genome (2008) 19:394-397.



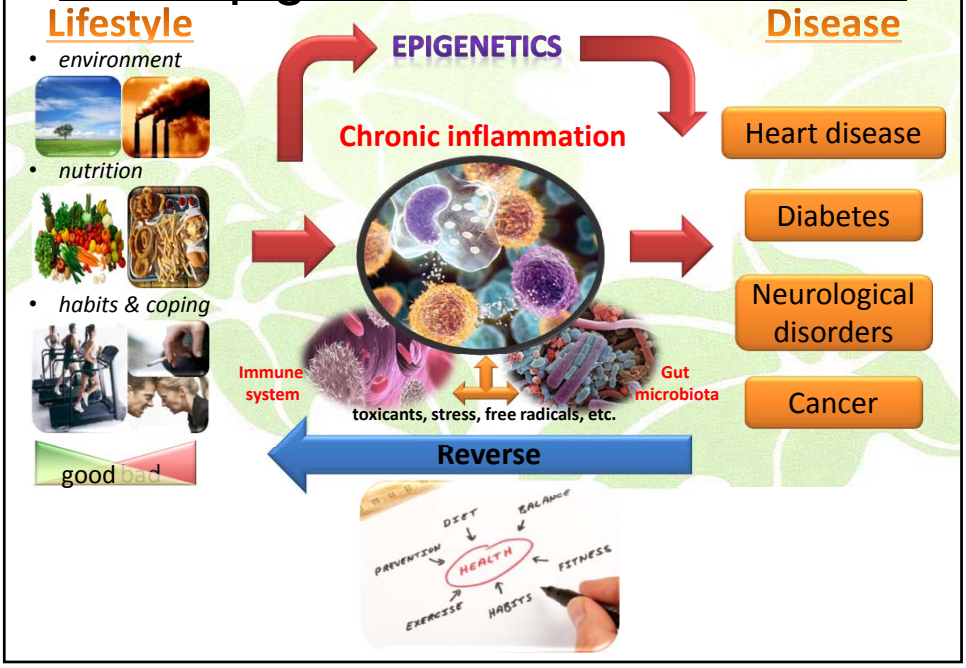
Maternal diet influences long-term health of offspring

High methyl-donors (*i.e.* folate) → offspring are more frequently agouti, lower risk for obesity
(agouti offspring more likely to give birth to agouti pups)

Low methyl-donors → offspring are more frequently yellow, higher risk for obesity
(yellow offspring more likely to give birth to yellow pups)

Dutch Famine Birth Cohort Study (*Lumey 1992*): children conceived in times of famine had higher risk for metabolic and cardiovascular disease→ past down to grandchildren

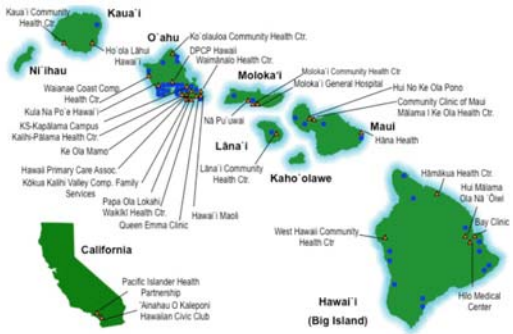
Epigenetics & Disease



Finding Solutions

Improvements in health status:

- Community-based integrated approaches to health & well-being
- Initiatives that incorporate cultural knowledge & practice
- Collaborations and partnerships are key to innovative & sustainable solutions: ***Prevention-focused health care!***



DNHH-Community Partnerships: ‘Ulu network