Public Health in this Brave New World
(Lessons from being a SPH Dean@NUS)

ST Lee Lecture, University of Sydney
8 August 2017
Singapore River, 1950s
Turning Discovery into Healthier Communities
The increasing rates of change in human activity since the beginning of the Industrial Revolution. Significant increases in rates of change occur around the 1950s in each case and illustrate how the past 50 years have been a period of dramatic and unprecedented change in human history.
Evolution of Public Health

*Public Health has EVOLVED very slowly when compared with The Great Acceleration*

- Improvement of population health was primarily a by-product of economic and national development.
- Improvement of sanitation, housing and water supply.
- Little contribution from medical sciences.
Improvement in housing, sanitation, nutrition and general health status decreased the incidence of TB.
Evolution of Public Health

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PH 1.0
- Improvement of population health was primarily a by-product of economic and national development.
- Improvement of sanitation, housing and water supply.
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PH 2.0
- Biological basis for Public Health.
- Intervention of single factors: vaccination, occupational exposures.
- Leadership by medical professionals.
SMOKING & LUNG CANCER: association or causation?

Figure 2.1  Adult* per capita cigarette consumption and major smoking and health events, United States, 1900–2012

(Main) Risk Factor(s) for Heart Diseases

Modifiable risk factors:
- Hypertension
- HDL, LDL
- Diabetes

Heart Disease

Original cohort
5,209 participants
1948

Offsprings cohort
5,124 adult children & spouses
1971

3rd generation cohort
3,900 grandchildren
2004

1951: Pop. 28,000
The Human Genome Project

“We are here to celebrate the completion of the first survey of the entire human genome.....In coming years, doctors increasingly will be able to cure diseases like Alzheimer’s, Parkinson’s, diabetes and cancer by attacking their genetic roots.”

President Bill Clinton

“...a revolution in medical science whose implications far surpass even the discovery of antibiotics...a breakthrough that opens the way for massive advances in the treatment of cancer and hereditary diseases, and that is only the beginning.”

Prime Minister Tony Blair

June 26, 2000
Completion of HGP
Evolution of Causality

Causal Factor ($X$) $\rightarrow$ Outcome ($Y$)

Risk Factors ($X_1..X_n$) $\rightarrow$ Outcome ($Y$)

Social-Ecological System

PERSONAL
INTER-PERSONAL
COMMUNITY
ORGANIZATIONAL
ENVIRONMENT
(Physical, Political, Economic)

Spectrum of $Y$
Medicalisation of Complexity

MICROBIOME
Humans Have Ten Times More Bacteria Than Human Cells: How Do Microbial Communities Affect Human Health?

Energy Intake >>> Output

Obesity

GENOME

Metabolism  HPA  Appetite
I think the next century will be the century of complexity.

Stephen Hawking
January 2000
Brave New World: VUCA

Volutility
Uncertainty
Complexity
Ambiguity

Swan
Elephant
The BLACK ELEPHANT is a chimera created by our minds by fusing the "black swan" and the "elephant in the room" catalysed by our cognitive bias.
Lessons

✓ The world has changed and is continually changing in a complex, volatile and unpredictable manner.
Academic culture promotes Cognitive Bias

- Publish or Perish culture
- "Ivory Tower" culture
- Academic Freedom culture
“Publish or Perish” Culture

✓ Ranking and promotions are still based primarily on publications.

✓ International recognition is based on disciplinary excellence, not societal impact.

“He didn’t publish, so he perished.”
Honest evaluation of our academic culture:

- Impact factor of journals is not a measure of impact!
- Citation index, h-index is a measure of academic popularity, not of influence!
- University ranking is an index of marketing success and not a measure of academic excellence!
Ivory Tower of University Research

✓ Academics tend to be purists.

✓ Academics do not want to be sullied by the real world.

✓ Academics like to speak in a way which the public, policy makers, and others can understand.
**Academic Freedom**

Academic freedom is the freedom to teach and do research in any area without constraint, to discover and promulgate new ideas no matter how controversial. Like other accepted freedoms, academic freedom requires individuals, authorities, and governments not only to allow scholars to work without restraint but also to prevent any interference with this freedom. In addition, academic freedom seems to require something more: that society provide conditions in which new ideas can be generated, nurtured and freely exchanged. Historical examples show the need for academic freedom. Socrates (c. 470-399 B.C.) was put to death for corrupting the youth of Athens with his ideas. Galileo (1564-1642) was sentenced to life imprisonment for advocating the Copernican view of the solar system. Descartes (1596-1650) suppressed his own writing to avoid similar trouble. Teachers were fired for telling their students about Darwin’s (18-90-1882) views. The ideas of these great thinkers have survived, but we will never know how many others were completely suppressed.


**In this day and age, can we still harbour such an expectation:**
“Society owes us and need to protect our academic freedom”?
Academic Freedom

Encourages academia-government divide.
Encourages academia-industry divide.
May result in academia-community divide.
Lessons

✓ The world has changed and is continually changing in a complex, volatile and unpredictable manner.

✓ Cognitive bias in the academic world kept us from changing and we continue operating in a way that is unconnected to the real world.
✓ Complex interplay of biology, environment, social determinants, healthcare and political systems.
✓ Numerous enablers and barriers.
✓ Requires simultaneous engagement of multiple sectors and stakeholders with clear vision & leadership.

To cope with a volatile, unpredictable, changing and complex world, we need to usher in PH 3.0
Cross-disciplinarity: The involvement of different disciplines.

Multi-disciplinarity

Inter-disciplinarity

Trans-disciplinarity
Public Health is intrinsically a translational and integrated discipline requiring community engagement…
unfortunately, many SPHs do not train our students to *integrate, translate and implement*

Public Health is “the science and art of preventing disease, prolonging life and promoting health and efficiency through organized community effort…with strong academic-government partnerships.”

Professor C.E.A. Winslow
1877-1957
Founder, Yale School of Public Health
Lessons

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✓ Cognitive bias in the academic world kept us from changing and we continue operating in a way that is unconnected to the real world.

✓ The academic PH community need to lead the way
  • Embrace complexity; usher in PH3.0
  • Enhance research translations: usher in trans-disciplinarity with greater academic-government engagement
Traditionally, we train Public Health Leaders like the way we train specialist athletes.....
We need to train Public Health Leaders like the way we train triathletes … “One mile deep and One mile wide”

Public Health LEADERS who can INTEGRATE, TRANSLATE and IMPLEMENT.
Summary

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✓ Cognitive bias in the academic world kept us from changing and we continue operating in a way that is unconnected to the real world.

✓ The academic PH community need to lead the way
  • Embrace complexity; usher in PH3.0
  • Enhance research translations: usher in trans-disciplinarity with greater academic-government engagement
  • Encourage integration: usher in the PH triathlete