The Top Ten reasons for geoscientists and doctors to talk to each other

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Who am I?
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- Adventures in GIS: IHGCs 1 & 2
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- Revelations: health & geoscience professionals have lots in common
Who am I?

• Adventures in GIS: IHGCs 1 & 2
• Revelations: health & geoscience professionals have lots in common
• (Also, they like pretty pictures)
Who are you?

• Geoscientists?
• Health scientists?
• Maybe some of both?
What is the meaning of life?

*Hint: Deep Thought*
We will not spend much time convincing each other that we are here to make the world a better place.

By corollary, that our work should help those most in need.
2. Big problems need big solutions
The moral test of government is how it treats those who are in the dawn of life, the children; those who are in the twilight of life, the aged; and those in the shadows of life, the sick, the needy and the handicapped.
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-Sen. Hubert Humphrey Building, Washington DC, 11/4/77
(Current home of the Center for Medicare & Medicaid Services)
3. Big solutions need many sources of knowledge


http://video.google.com/videoplay?docid=4993386800939356610&vt=lf&hl=en
4.

Data are increasingly agnostic to which group originated them

And will be utilized for increasingly interdisciplinary purposes
GIS, too
Buildings
Roads, rivers
Land parcels
Elevation data
Satellite image data
Underlying geographic space

Conserved regions
Expression levels
Genes
Chromosome space

http://www.gis.com/whatisgis/whyusegis.html
Health problems which keep us busy

(and which need us to talk more)
5.

- Heart Disease And Stroke
  - More than 7 million deaths a year
  - Effects of the built environment
  - Effects of the natural environment
5.

- Heart Disease And Stroke
- Effects of the built environment:
  - Exercise, food deserts, diet quality, access to care
5.

- Heart Disease And Stroke
- Effects of the natural environment
5.

• Heart Disease And Stroke
• Effects of the natural environment:
  • Air Pollution; link to asthma & smoking
5.

• Heart Disease And Stroke
• Effects of the natural environment:
Heart Disease And Stroke
- Rhodnius prolixus, the triatomine bug transmitting T. cruzi, causing Chagas disease
- 11 M people worldwide have Chagas
- Leading cause of heart disease in Latin America
- Newly deforested areas esp. near the Amazon at high risk
6.

- Lung disease
  - More than 7 million deaths a year
  - Lifestyle or Environment?
6.

- Lung disease
  - Tobacco -- COPD, lung cancer
  - Genetics + ?-- Asthma
  - Environment -- ?
6.

- Lung disease
  - Tobacco -- COPD, lung cancer
  - Genetics + ?-- Asthma
  - Environment -- asbestosis, silicosis, environmental toxins, acid rain, radon
7.

- Diarrheal disease
  - More than 2 million deaths a year
7.

• Diarrheal disease
  • More than 2 million deaths a year
  • Structural reasons: Water & Sanitation
7.

- Diarrheal disease
  - More than 2 million deaths a year
  - Structural reasons: Water & Sanitation
  - Environmental reasons: Floods, climate change, natural disasters
8.

- HIV/ AIDS
8.

- HIV/ AIDS
- [Really?]
8.

- HIV/AIDS
  - More than 2 million deaths a year
8.

- HIV/AIDS
  - More than 2 million deaths a year
  - AIDS deaths usually caused by a secondary condition
8.

- HIV/ AIDS
  - More than 2 million deaths a year
  - AIDS deaths usually caused by a secondary condition
  - Usually a respiratory or diarrheal disease
The 10 leading causes of death in the world

2011

1. Ischaemic heart disease: 7 million
2. Stroke: 6.2 million
3. Lower respiratory infections: 3.2 million
4. COPD: 3 million
5. Diarrhoeal diseases: 1.9 million
6. HIV/AIDS: 1.6 million
7. Trachea bronchus, lung: 1.5 million
8. Diabetes mellitus: 1.4 million
9. Road injury: 1.3 million
10. Prematurity: 1.2 million
9.

• Back to foundations: Social Determinants of Health
9.

- Social Determinants of Health

Source: Dahlgren and Whitehead, 1991
9.
The Case for foundational cooperation among scientists
The Case for foundational cooperation among scientists

“As resources will always be limited, these should be used in such a way as to equitably provide those health care forms which have been shown to be effective through appropriately designed assessments.”

-Archie Cochrane
9.
The case for foundational cooperation among scientists

• School education & science curricula
• Evidence-based health care reform
The story of polio
• Exploring Polio
  – Perhaps the last disease to be eradicated?
  – What lessons are there for us?
  – What does geoscience have to do with it?
• A bit about Polio

• Affects mostly children under 3 (50% of all cases)
• Can cause partial paralysis of legs; sometimes paralysis of respiratory muscles (life-threatening)
• Humans are the only reservoir for the poliovirus
• Transmission is usually fecal-oral through contaminated water
• No treatment
Eradicating polio?

• In 1988, the World Health Assembly (WHA) - annual meeting of the Member States of the World Health Organization- voted to launch a global goal to eradicate polio

• As a result, the largest public health effort to date was put together: The Global Polio Eradication Initiative (GPEI)
Polio vaccination

- 2 types: OPV- oral (live) ; IPV- injected (inactivated)
- Developed countries have switched to IPV
- Developing countries use OPV
  - easy to give (drops)
  - cheap (8 cents a dose)
  - Shedding of virus from immunized kids can immunize others
And the geoscience part

- Needs high herd immunity
And the geoscience part

- Needs high herd immunity
- Which needs access to people and their kids
And the geoscience part

- Geography and Geology are not our friends here
And the geoscience part

- Geography and Geology are not our friends here
- Or are they?
- The 2006 earthquake was the way for the polio team to access the most remote areas of Pakistan & Afghanistan
Links & References

• CDC’s Social Determinants of Health site: http://www.cdc.gov/socialdeterminants/