Another ‘Great Stink’ is needed: Sanitation and hygiene in poor urban areas

Ben Fawcett
The slums of Kolkata
"We are ... as it may be living in [a] wilderness, so far as the rest of London knows anything of us, or as the rich and great people care about. We live in much dirt and filth. We ain’t got no priviz, no dust bins, no drains, no water splies and no drain or suer in the hole place ... The stench of a Gully-hole is disgustin. We, all of us, suffer and numbers are ill, and if Colera comes Lord Help Us ... we are living like pigs and it ain’t fair we should be ill treted."

Letter to The Times of London, July 1849
The slums of London
The Great Stink, London, 1858

THE SILENT HIGHWAYMAN
‘Your money or your life’.
"For the first time in the history of man, the sewage of nearly three millions of people had been brought to seethe and ferment under a burning sun, in one vast cloaca lying in their midst. The results we all know. Stench so foul, we may well believe, had never before ascended to pollute this lower air. Never before, at least, had a stink risen to the height of an historic event."

Dr William Budd FRS

(Identified the transmission of typhoid)
London’s interceptor sewers
Construction of London’s interceptor sewers, 1860s
Opening the Crossness pumping station, 1865
Lessons from the 19th century

• We are concerned with public health
Lessons from the 19th century

• We are concerned with public health; a government responsibility
Lessons from the 19th century

- We are concerned with **public** health; a government responsibility
The costs and benefits of sanitation

Benefit: cost of universal sanitation by 2015

\[ = 11.2 : 1 \]

Total annual cost of universal sanitation (2005-15)

\[ = \text{US$14.5bn per annum} \]

Total impact of inadequate sanitation (in six countries of S and SE Asia, inc India)

\[ = 5.3\% \text{ of GDP} \]

\[ = \text{US$42 per capita per year (ave.)} \]
Lessons from the 19th century

• We are concerned with **public** health; a government responsibility

• Diseases of interest are **excreta-related**, not just water-related
John Snow – cholera in Soho, 1854
John Snow, Henry Whitehead – cholera in Soho
Lessons from the 19th century

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The F-diagram (faecal-oral transmission)

Faeces → Fluids → New host
Faeces → Fields → New host
Faeces → Flies → New host
Faeces → Fingers → New host
Fields → Food → New host
Flies → Food → New host
Fingers → Food → New host
The F-diagram

Faeces — Fluids — Fields — Flies — Fingers — Food — New host
The F-diagram

- Faeces
- Fluids
- Fields
- Flies
- Fingers
- Food
- New host
Other excreta-related diseases

- Soil-transmitted helminths (*Ascaris, Trichuris, hookworm*)
Ascariasis (roundworm)
Other excreta-related diseases

- Soil-transmitted helminths (*Ascaris, Trichuris, hookworm*)
Other excreta-related diseases

- Soil-transmitted helminths (*Ascaris*, *Trichuris*, *hookworm*)
- Trachoma
- Schistosomiasis
- Filariasis
Filariasis (elephantiasis)
Lessons from the 19th century

• We are concerned with public health; a government responsibility

• Diseases of interest are excreta-related, not just water-related

• Sanitation goes beyond the toilet
"The solution to pollution is dilution"

It isn’t!
Polluted rivers in India
Sludge removal
Sludge disposal
Lessons from the 19th century

• We are concerned with **public** health; a government responsibility

• Diseases of interest are **excreta-related**, not just water-related

• Sanitation goes **beyond the toilet**; effective services are needed as well as facilities
Global population trends 1950-2030 (Source UNDESA)

LDC urban population:
- 2010: 45% 2.6bn
- 2050: 66% 5.2bn
Global slum population: 2011: 1.05 billion
Global slum population:
2011: 1.05 billion
2030: 2 billion
2050: 3 billion? of 9bn
Slums: Mumbai, India

Slums:
- overcrowding
- poor housing
- inadequate water & sanitation
- insecurity of tenure
Under-5 mortality rates in Kenya (per ‘000)
Urban under-5 mortality rates in India

- Uttar Pradesh
- Rajasthan
- Madhya Pradesh
- Jharkhand
- Bihar
- Delhi
- All India
- Maharashtra

Poorest quartile
Rest of urban population

Mortality/1000 live births
“High concentrations of people and wastes in urban areas create more opportunities for exposure to pathogens, and a correspondingly greater need for the levels of hygiene that adequate water and sanitation make possible.

In the poorest countries and neighbourhoods, unsanitary living conditions probably account for at least half of the burden of ill-health.”

Open defecation
"Sanitation, more than any other human rights issue, evokes the concept of human dignity; consider the vulnerability and shame that so many people experience every day when, again, they are forced to defecate in the open, in a bucket or a plastic bag. Dignity closely relates to self-respect, which is difficult to maintain when being forced to squat down in the open, with no opportunity to clean oneself and facing the constant threat of assault in such a vulnerable moment."

Report of the UN Special Rapporteur on the human right to water and sanitation, 2009
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Report of the UN Special Rapporteur on the human right to water and sanitation, 2009
The bathroom
The kitchen sink
What is wanted?

'Clean toilets; not having to lift raw sewage and dump it into the Mwengenye River [which we also use for bathing and cleaning]; bathing spaces with warm water for the elderly and young children; water to clean clothes and homes; roads that are not always filled with [human and animal] wastes; roads, homes and toilets that don't flood in the rainy months – that is what I think is appropriate sanitation.'

Margaret Wangui, Maili Saba, Nairobi
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Margaret Wangui, Maili Saba, Nairobi
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<tbody>
<tr>
<td></td>
<td>2000</td>
<td>2008</td>
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<tr>
<td>Africa</td>
<td>46 (16%)</td>
<td>175 (45%)</td>
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<tr>
<td>Asia</td>
<td>297 (22%)</td>
<td>536 (34%)</td>
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<td>Latin America/Caribbean</td>
<td>51 (13%)</td>
<td>64 (14%)</td>
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<td>Developing world</td>
<td>394 (19%)</td>
<td>775 (32%)</td>
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<td>150-180m (50-60%)</td>
<td>600-800m (45-60%)</td>
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<td>850-1130m (40-55%)</td>
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What is needed?

- Effective partnerships
- Facilities and services
- Creative financing
- Political commitment
Student research projects

Eng. for Dev’t, Southampton, 1996-2006
PhD, Southampton, 1997-2004
MIWM, IWC, Brisbane, 2009-11
Work locations

- Eng. for Dev’t, Southampton, 1996-2006
- PhD, Southampton, 1997-2004
- MIWM, IWC, Brisbane, 2009-11
- Work locations: Ben & former students

2nd International WaTER Conference, Oklahoma 2011
Gorgol Noir irrigation scheme, Mauritania, 1984
Water supply for refugees, northern Uganda, 1993
International WaterCentre students, Brisbane
International WaterCentre students, Brisbane
"The situation is hopeless; we must now take the next step"

Pablo Casals
“The situation is hopeless; we must now take the next step”

JS Bach, Suite No 1 for solo cello in G major, Sarabande
There’s still a lot to do!