

Well being and public policy challenges in India

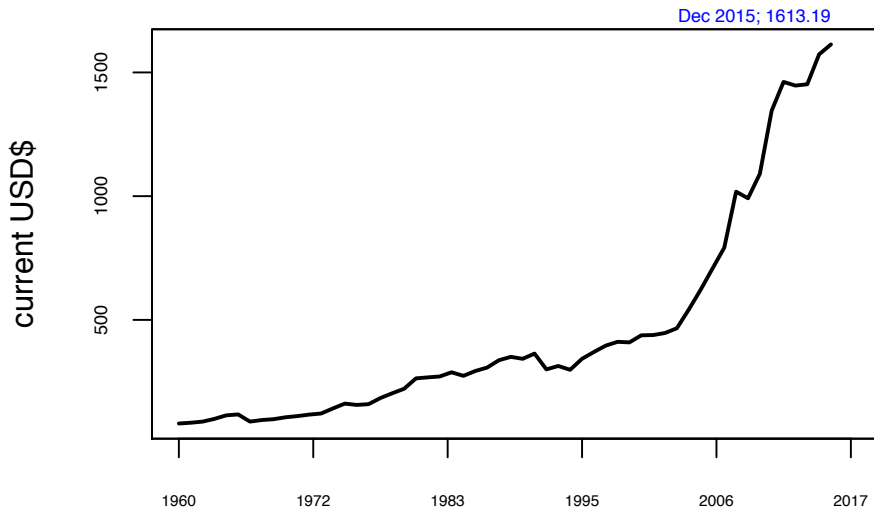
Ila Patnaik

5th September 2017, Basel

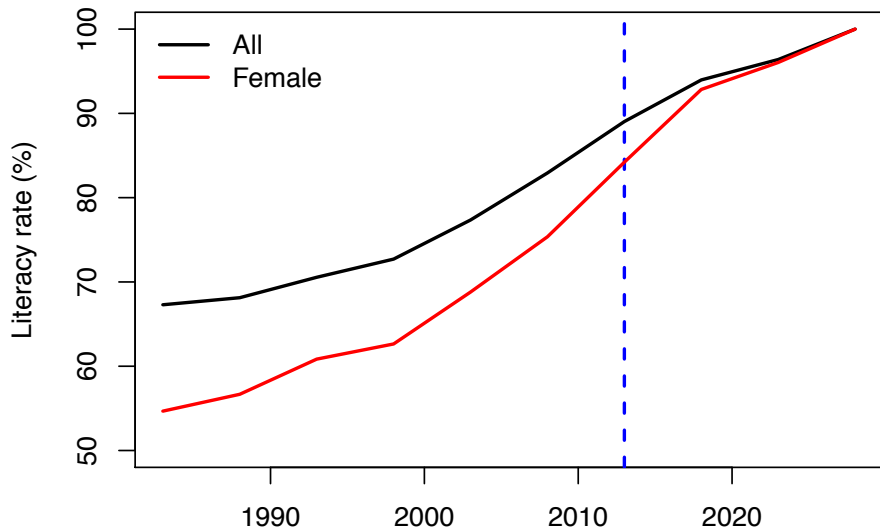
More than GDP

- Well being is more than GDP
- Economists have focussed on GDP growth
- Public policy has addressed GDP growth and issues related to low per capita income and poverty.

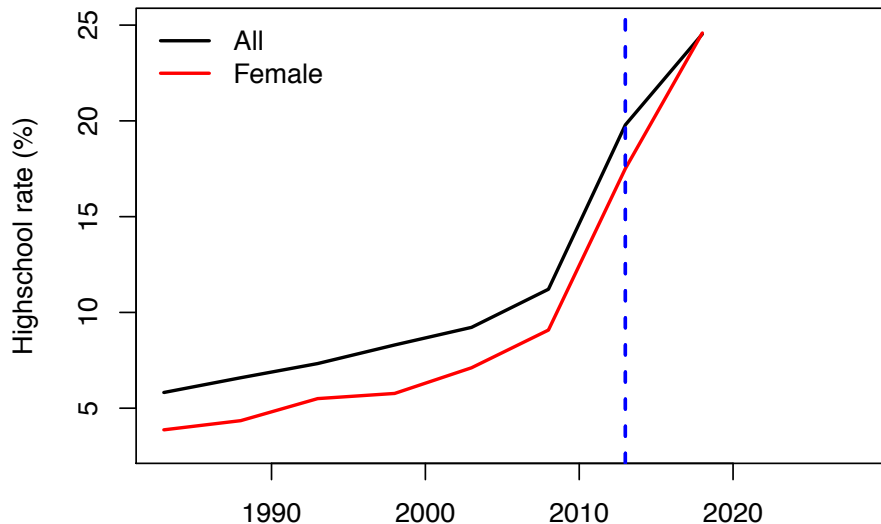
Per capita GDP has grown rapidly



Sharp rise in literacy levels



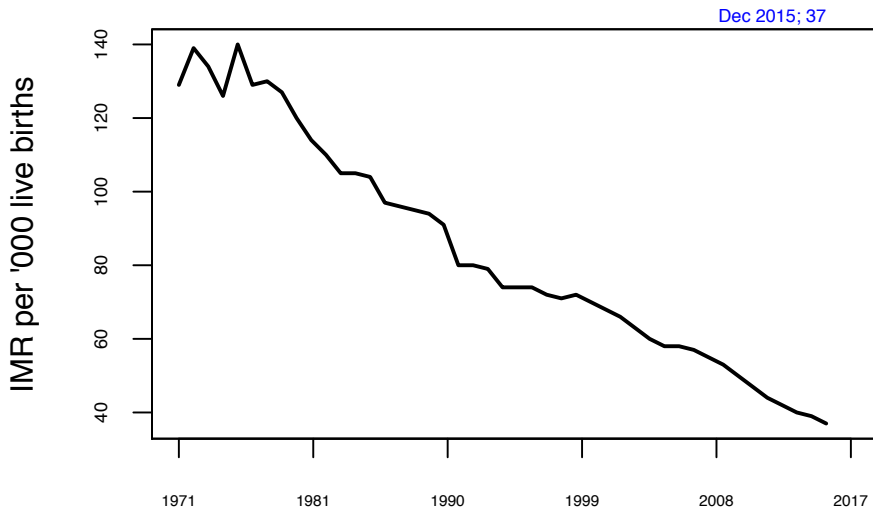
School education growing



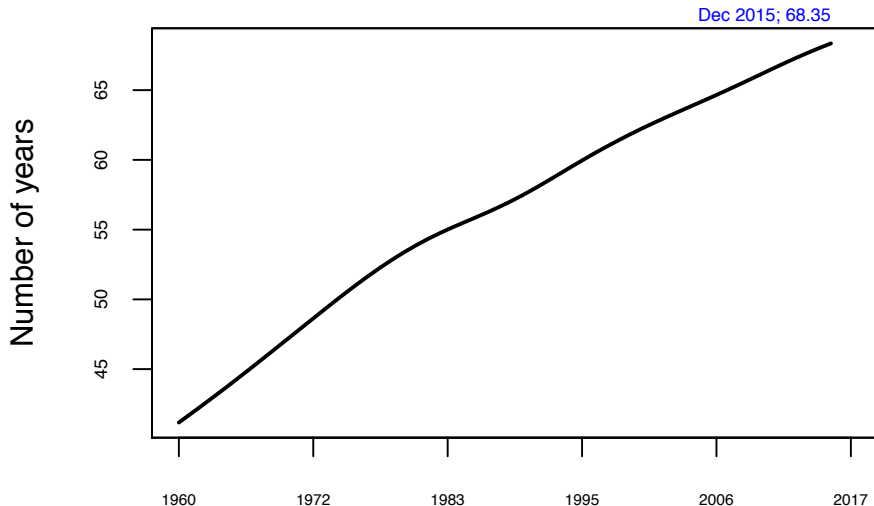
Education attainments

Year	Literacy rate	Years of schooling
1980	41	1.9
1990	48	3.0
2000	61	3.6
2010	69	4.4
2014	72.1 (estimated)	5.4

Health: IMR has fallen



Life expectancy has risen



Existing approach

- Per capita income has seen high growth.
- Health and education have also improved.
- Traditional disease burden: Poverty, malnutrition, illiteracy and poor health services related high IMR, high MMR, tuberculosis, cholera, leprosy.
- Strategy: GDP growth+educating the girl child+health care
- Water, sanitation

Negative externalities of growth

- The problem arises when growth has negative externalities, those that have a negative effect on well being.
- Public policy needs to take this into account.
- We see these most vividly in the case of health.

Main argument

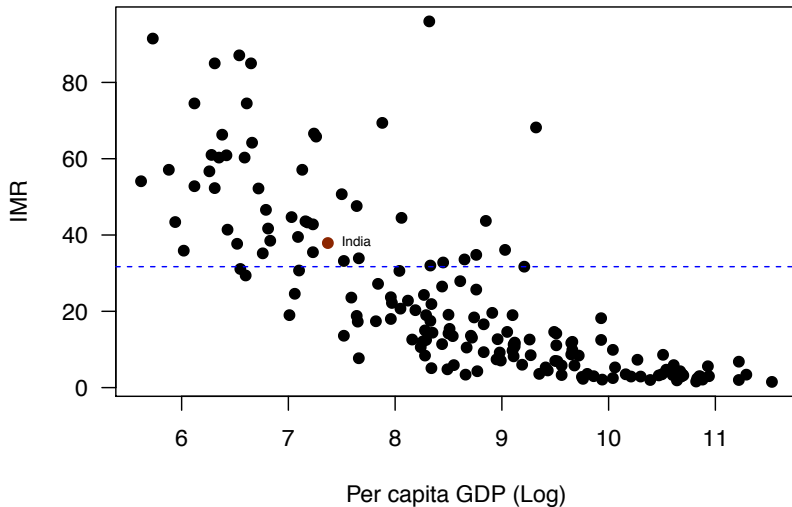
- Traditional thinking about disease burden:
Poverty, malnutrition, illiteracy and poor health services
Tuberculosis, cholera, leprosy, Dengue, Chikungunya
Related high IMR, high MMR.
- Emerging disease burden:
Ageing population
Heart disease, diabetes, respiratory tract diseases.
- Growth, urbanisation and bad planning
Risks from polluted air and water, unsafe buildings, unplanned cities, bad drainage, poor sewage, bad garbage disposal systems.
- Rapid GDP growth that has raised health risk.

Where we are

- Every 4 minutes a child under 5 dies in India from preventable diseases like diarrhea, typhoid, measles, malaria and pneumonia.
- Every day 1000 Indian children die because of diarrhea.
- Every day 160 women die in India from preventable causes related to pregnancy and childbirth.

Traditional thinking: Prevention is better than cure, 19th century public health will yield huge gains on communicable diseases.

GDP growth will improve health...



GDP → health outcomes

Gains

Housing

Nutrition

Mother's education

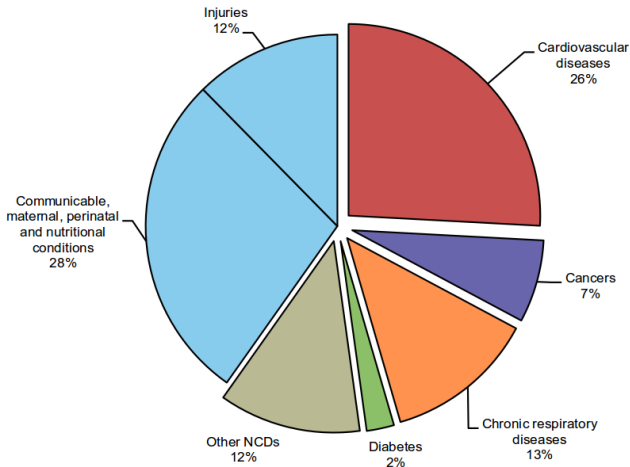
Ability to purchase health care

...

A benign picture?

- India has achieved a 'miracle' with high GDP growth
- Last 35 years, average growth of 6.3% per year, this is doubling every 11 years
- If this goes on, we have to just ride this GDP growth to good health outcomes.
- Mission accomplished!
- Or is it?

NCDs cause 60% of total deaths (all ages)



Total deaths: 9,816,000
NCDs are estimated to account for 60% of total deaths.

What kills? India, 2015

1. Ischemic heart disease
2. COPD¹
3. Cerebrovascular disease
4. Lower respiratory infect
5. Diarrheal diseases
6. Tuberculosis
7. Diabetes
8. Chronic kidney disease
9. Neonatal pre-term birth
10. Road injuries
11. Neonatal encephalopathy

¹ Chronic obstructive pulmonary disease

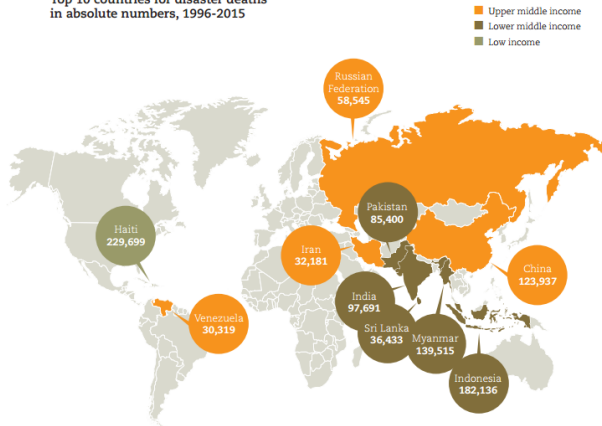
What kills before mean life expectancy? India 2015

1. Ischemic heart disease
2. Neonatal pre-term birth
3. Neonatal encephalopathy
4. Lower respiratory infect
5. COPD
6. Diarrheal diseases
7. Cerebrovascular disease
8. Tuberculosis
9. Road injuries
10. Self-harm
11. HIV/AIDS

Leading causes of death

Disasters

Top 10 countries for disaster deaths
in absolute numbers, 1996-2015



Leading causes of Deaths

Road accidents

India road crashes kill 146,133 people in 2015

🕒 10 June 2016 | [India](#)

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THE INVISIBLE KILLER

Air pollution may not always be visible, but it can be deadly.



36%
OF DEATHS FROM
LUNG CANCER



34%
OF DEATHS FROM
STROKE



27%
OF DEATHS FROM
HEART DISEASE

[10-25 YEARS]

Air pollution takes an early toll on heart



Even healthy young adults may suffer the ill effects of air pollution. For three consecutive years, researchers traced levels of air pollution at three monitoring sites in and near Provo, Utah. They took blood samples from 72 healthy volunteers, average age 23, all of them non-smokers. The study found consistent relationships between levels of air pollution and damage to cells in the endothelium, the inner lining of the blood vessels.

NYT

AIIMS

How 4-yr study mapped pollution-arthritis link

KAUNAIN SHERIFF M

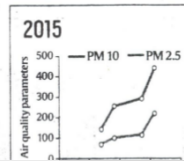
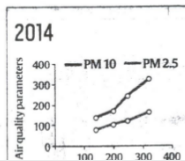
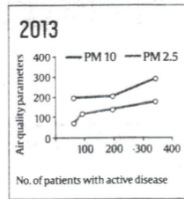
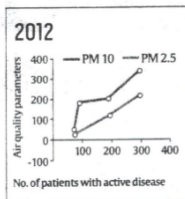
NEW DELHI, OCTOBER 28

IN A study conducted by AIIMS, the symptoms of 500 persons with active Rheumatoid Arthritis was compared with air parameters in Delhi. The median age for men was 43 years and while it was 48 years for women. The disease duration was 10 years.

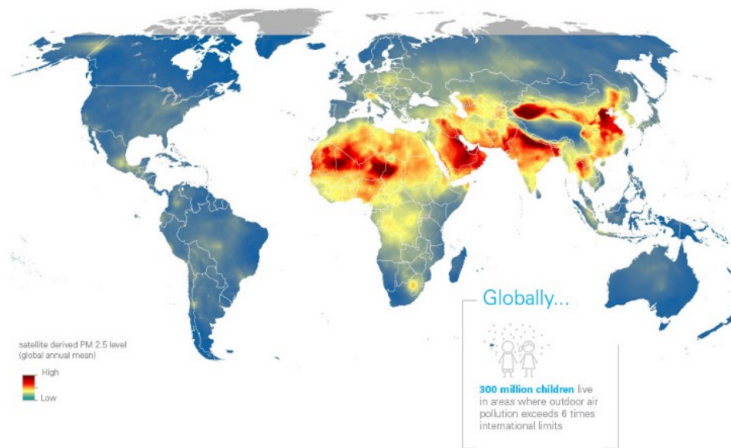
The study showed that as particulate matter (PM) levels increased in the air, symptoms of Rheumatoid Arthritis took a turn for the worse. This indicates that there is a significant correlation between the increase in levels of particulate matters in Delhi and a flare in arthritis symptoms.

■ In 2012, levels of PM 10 and PM 2.5 "significantly correlated with flare of disease". When PM

WORRYING SYMPTOMS



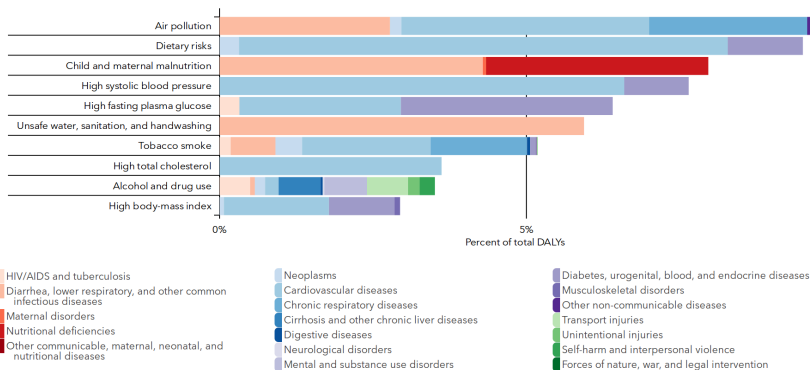
High levels of air pollution in India



Clear the Air for Children uses satellite imagery to show for the first time how many children are exposed to outdoor pollution, and where they live across the globe.

Air pollution in India drives the most death and disability combined?


India 2015 ranking



Air pollution causes child mortality

Air pollution behind 10% under-5 years deaths: Unicef report

By TNN | Updated: Nov 01, 2016, 08.06 AM IST

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NEW DELHI: A report by the United Nations Children's agency, [Unicef](#), released on Monday has confirmed the worst fears of people living in polluted areas — that bad air is contributing to death of many children even before they celebrate their fifth birthday.

Outdoor and indoor pollution, the agency noted, are directly linked to respiratory diseases that account for almost one in 10 under-five deaths, making [air pollution](#) one of the leading dangers to children's health. "Children are more susceptible than adults to air pollution as their lungs, brains and immune systems are still developing and their respiratory tracks are more permeable. Young children also breathe faster than adults, and take in more air relative to their body weight," Unicef stated.



Impact of air pollution on lung function ²

- Reduced lung function in 43.5% schoolchildren of Delhi compared with 25.7% in the control group
- Delhi's children had increased prevalence of lung functions deficits (9.6% compared to 3.5% in the control group)
- Sputum of Delhi's children contained 4-times more iron-laden macrophages (siderophages) than controls
- Prevalence of hypertension in children was 6.2% in Delhi compared to 2.1% in the control group

² Central Pollution Control Board, Ministry of Environment and Forests & Chittranjan National Cancer Institute, Kolkata (2012)

World's 20 most polluted cities

Half are in India



Delhi's air polluted more than 90 percent of the time

Jan 2013 - Oct 2016³

Raw PM 2.5 (24 hr average)		% of time
0-12	Good	0.00
12.1-35.4	Moderate	1.75
35.5-55.4	Unhealthy for Sensitive Groups	8.83
55.5-150.4	Unhealthy	36.54
150.5-250.4	Very Unhealthy	17.21
>250.4	Hazardous	18.38

³ 17.29% of time, data was not available

How does India look in 2040?

Projections based on current and announced policies

- SO₂ and NO_x emissions each projected to grow by about 10% to 2040
- PM_{2.5} emissions projected to grow by 7%
- The number of people expected to die prematurely from outdoor air pollution projected to grow to over 900,000

How should we think about this?

H is health outcome, Y is GDP.

- GDP growth ought to help improve health outcomes H
- We think $dH/dY > 0$, so just get to high GDP growth and ride the wave.
- But we should recognise that many things can go wrong in the growth process
- Urban planning, pollution, road safety, energy systems, disaster resilience.
- We are at a critical point in our trajectory where these decisions will dominate our future H trajectory
- Some of these decisions are irreversible.

Example: road safety

- At today's GDP Y_0 we utilise T_0 passenger-km of personal road transport.
- This results in $A_0 T_0$ people who get hurt, who show up in trauma centres, and some of them die.
- Next doubling of GDP will yield more than doubling of road traffic.
- Rash expansion of poorly designed highways: A will also go up.
- Perhaps higher A and higher T will imply that the number of people who get hurt in road accidents will be $5\times$ higher when GDP goes up by $2\times$.

GDP → health outcomes

Gains	Worsening
Housing	Road safety
Nutrition	Air quality
Mother's education	Water quality
Purchase health care	Disasters
...	...

Prevention vs. cure : a new perspective

- Health policy thinking should generally favour prevention over cure
- Traditionally, this has been the field of 'public health': water, sanitation, immunisation, epidemiology, etc.
- How do we reduce the probability that an individual gets sick or needs to seek health care?
- We need to layer another layer of strategic thinking on this: road safety, pollution control, energy systems, transportation systems, infrastructure
- Our overall objective should be: *Health risk reduction*.

Mainstreaming health risk reduction

- Reducing health risk cannot be done by the health community alone
- In particular, the Ministry of Health is only a small part of this
- This approach needs to pervade an array of government departments: urban planning, infrastructure, energy, pollution control, etc.
- Complex public administration problem of aligning all departments of government to pursue the goal of health risk reduction.

The key thing to focus on : dH/dY

- India is on a trajectory of doubling GDP every 11 years
- The question that we should ask is: How to improve dH/dY ?
- The way things are going, in many areas, we are going in the wrong direction.

We are at a critical moment in India's journey

A new wave of issues with political salience:

- Swacchh Bharat
- SC orders Delhi government to control vector borne diseases
- On 6 November 2016 schools in Delhi shut down due to air pollution for the first time
- Disaster Risk Reduction an emerging priority

Policy challenges

- Measurement, measurement, measurement.
- Governance, legislative and enforcement arrangements related to new priorities
- Politics

Thank you.