Environmentally related diseases and Environmental Burden of Disease

Mesyuarat Pelaksanaan NEHAP
PICC, Putrajaya

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Scope

KKM data sources:

- Disease surveillance
- Sentinel surveillance
- Hospital discharges

Review of report

- NC2
- EDB
- EPI

Environmental related illness

- Industrialization
- Urbanization

- Overcrowding
- Mushrooming of slums
- Poverty
- Physical & mental stress
- Traffic air pollution
- IAQ
- Noise pollution
- Deforestation
- Solid waste management

Environment-related disease is preventable

Key facts*

- 24% of global disease is caused by environmental exposures
- 33% of disease in children under the age of 5 is caused by environmental exposures.
- Preventing environmental risk could save as many as four million lives a year in children alone, mostly in developing countries.

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* *Preventing disease through healthy environments - towards an estimate of the environmental burden of disease*, WHO 2006

Environmental concerns

Deforestation, pollution of inland and marine waters, soil and coastal erosion, overfishing and coral reef destruction, along with air pollution, water pollution and the problem of waste disposal.

Trade-off

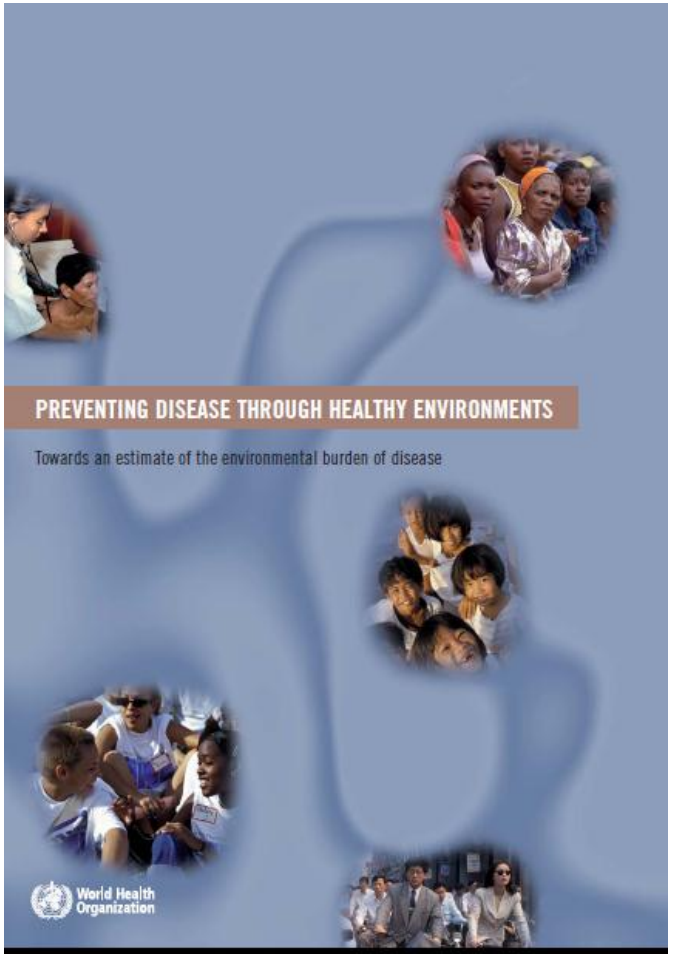
- Oil palm plantations are a prevalent feature of the Malaysian landscape, as this industry has become a major contributor to the country's export earnings.
- However, this expansion of land for oil palm cultivation has taken place at the expense of lowland tropical forests, which are ecologically sensitive habitats.

Environmental Health Concept

- Environmental causes of disease
- Environmental factors influencing disease
- Interactions between environment and health
- Environmental management influencing disease, disability and death

Preventing disease through healthy environments - towards an estimate of the environmental burden of disease, WHO 2006

- This report estimates that more than 13 million deaths annually are due to preventable environmental causes. Nearly one third of death and disease in the least developed regions is due to environmental causes.
- Over 40% of deaths from malaria and an estimated 94% of deaths from diarrhoeal diseases, two of the world's biggest childhood killers, could be prevented through better environmental management.



Preventing disease through healthy environments - towards an estimate of the environmental burden of disease, WHO 2006

- The four main diseases influenced by poor environments are diarrhoea, lower respiratory infections, various forms of unintentional injuries, and malaria.
- Measures which could be taken now to reduce this environmental disease burden include the promotion of safe household water storage and better hygienic measures; the use of cleaner and safer fuels; increased safety of the built environment, more judicious use and management of toxic substances in the home and workplace; better water resource management.

Diseases with the largest total annual health burden from environmental factors, in terms of death, illness and disability or Disability Adjusted Life Years (DALYs)1 are:

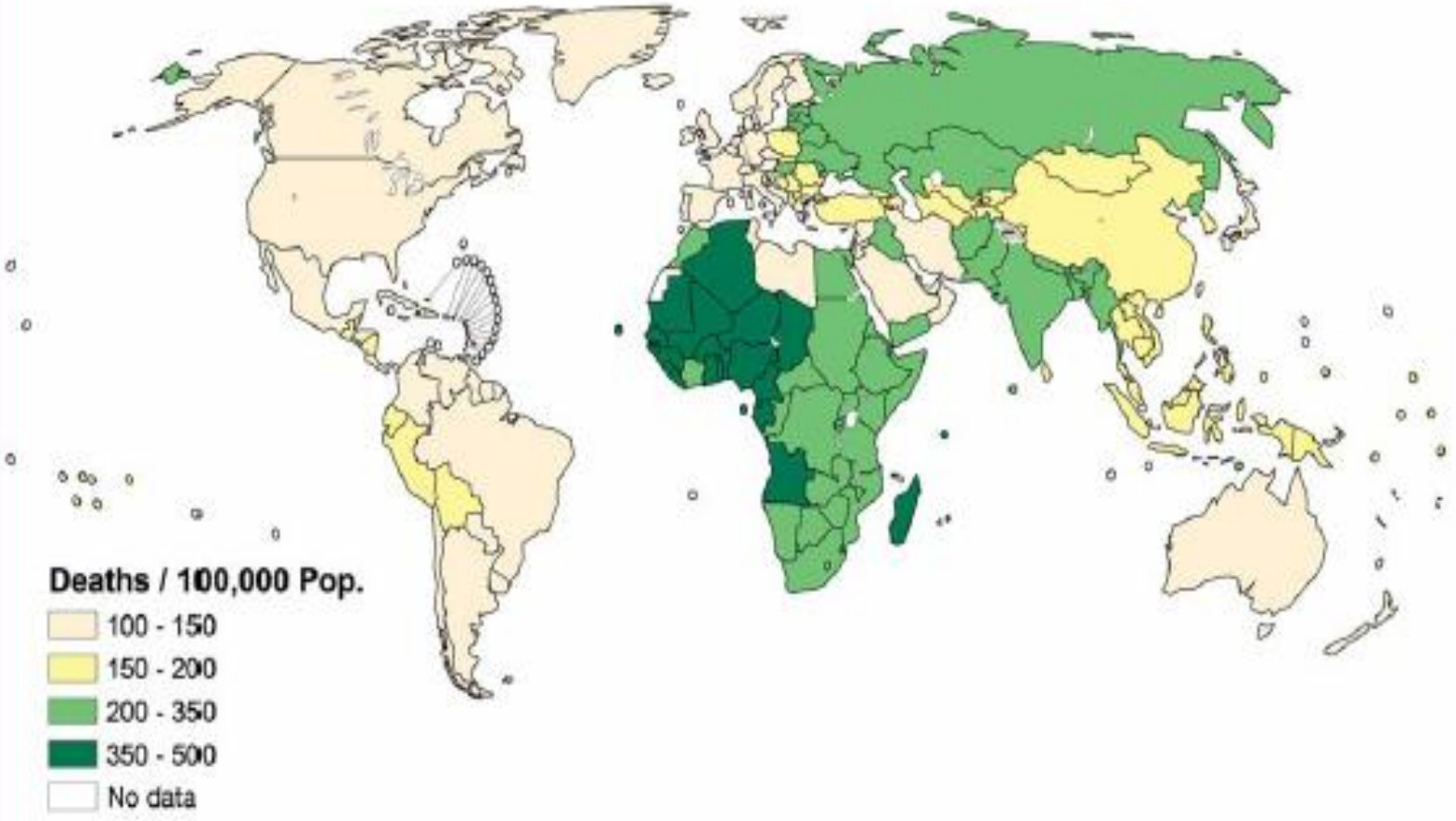
- **Diarrhoea** (58 million DALYS per year; 94% of the diarrhoeal burden of disease) largely from unsafe water, sanitation and hygiene
- **Lower respiratory infections** (37 million DALYs per year; 41% of all cases globally) largely from air pollution, indoor and outdoor.
- **Unintentional injuries** other than road traffic injuries (21 million DALYs per year; 44 % of all cases globally), classification which includes a wide range of industrial and workplace accidents.
- **Malaria** (19 million DALYs per year; 42% of all cases globally), largely as a result of poor water resource, housing and land use management which fails to curb vector populations effectively.
- **Road traffic injuries** (15 million DALYS per year; 40% of all cases globally), largely as a result of poor urban design or poor environmental design of transport systems.
- Chronic Obstructive Pulmonary disease **(COPD)** -- a slowly progressing disease characterized by a gradual loss of lung function. (COPD, 12 million DALYs per year; 42% of all cases globally) largely as a result of exposures to workplace dusts and fumes and other forms of indoor and outdoor air pollution.

- *DALYs = Disability Adjusted Life Years: The sum of years of potential life lost due to premature mortality and the years of productive life lost due to disability.*

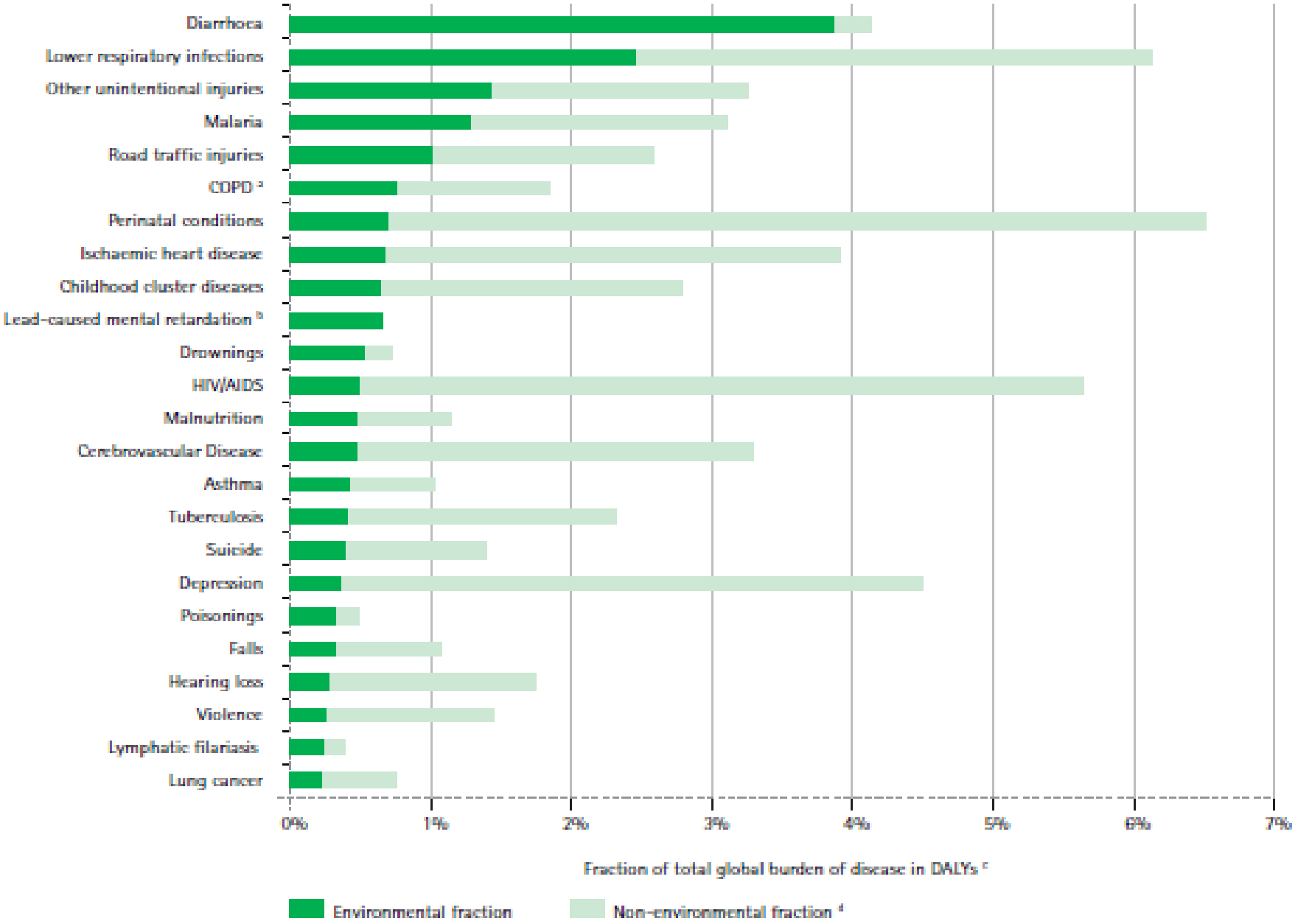
Deaths from environmental causes

- **2.6 million deaths annually from cardiovascular diseases**
- **1.7 million deaths annually from diarrhoeal diseases**
- **1.5 million deaths annually from lower respiratory infections**
- **1.4 million deaths annually from cancers**
- **1.3 million deaths annually from chronic obstructive Pulmonary disease**
- **470,000 deaths annually from road traffic crashes**
- **400,000 deaths annually from unintentional injuries**

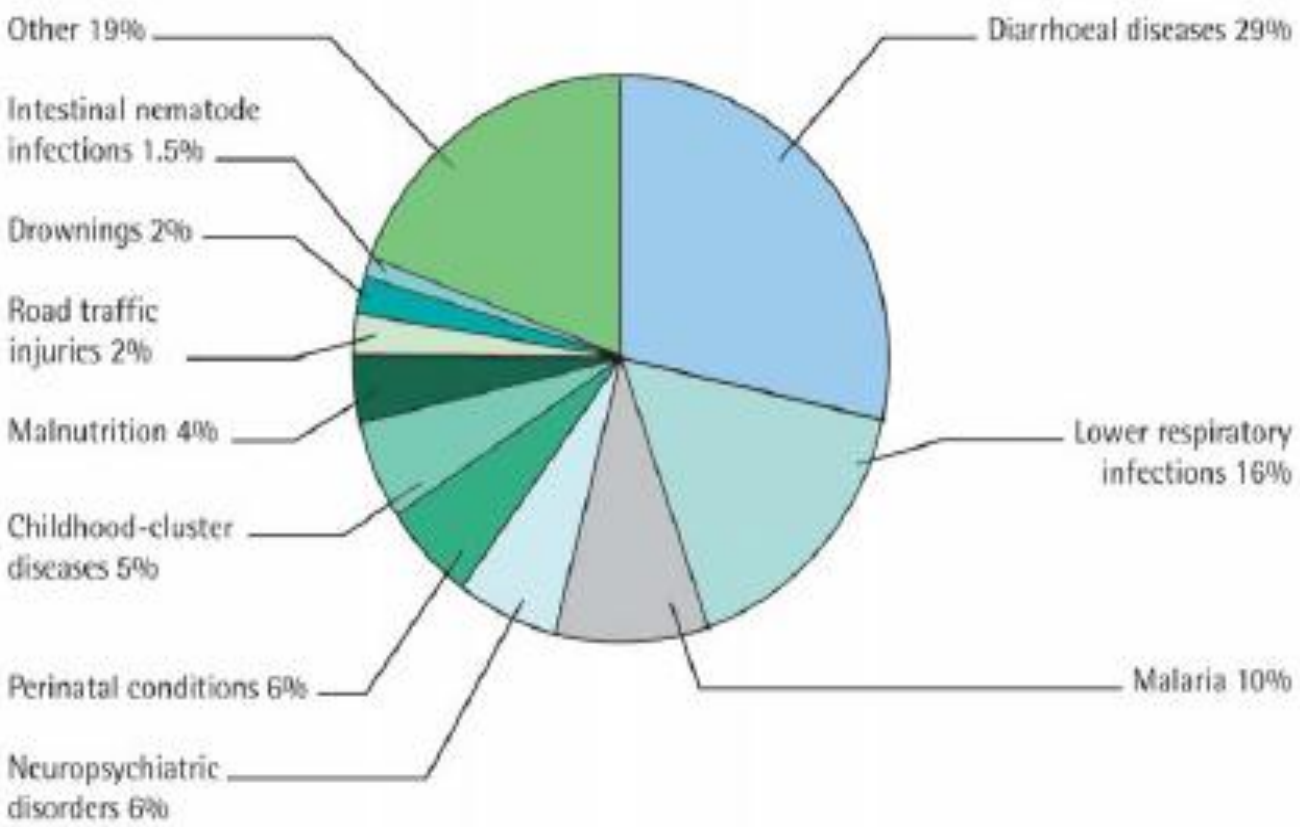
Environmental disease burden by WHO subregion (2002) [a]



Diseases with the largest environmental contribution



MAIN DISEASES CONTRIBUTING TO THE ENVIRONMENTAL BURDEN OF DISEASE AMONG CHILDREN 0–14 YEARS [a]



EBD by disease category (DALYs/1000 capital) per year

Disease Group	World's lowest country rate	Malaysia	World's highest country rate
Diarrhoea	0.2	1.1	114
Resp infection	0.1	1.4	56
Malaria	0	0.1	32
Other VBD	0	0.9	4.2
Lung cancers	0	0.4	2.5
Neuropsychiatric D.	1.4	1.9	4.4
CVD	1.3	2.4	13
COPD	0	1.4	4.7
Asthma	0.3	1.2	2.4
Musculoskeletal D.	0.5	0.9	1.5
RTI	0.3	1.9	10

Source: WHO 2007

WHO Environmental Burden of Disease (EBD) series

- The Environmental Burden of Disease (EBD) series aims at supporting countries to generate reliable information for policy-making, by presenting methods for estimating the environmental burden at national and regional levels.
- The introductory volume in the series outlines the general method (Prüss-Üstün et al., 2003), while subsequent volumes address specific environmental risk factors.
- The guides on specific risk factors are organized similarly, first outlining the evidence linking the risk factor to health, and then describing a method for estimating the health impact of that risk factor on the population.

- It has been shown that climate change causes impacts on various communicable and noncommunicable
- diseases and injuries (WHO, 2002; McMichael et al., 2003a; Ezzati et al.,
- 2004). While the environmental risk is distributed globally, most of the actions that are
- necessary to protect health under a changing climate are local. Quantitative assessment of
- the size and distribution of health risks can therefore be an important tool in identifying
- which actions will be most effective in adapting to climate change. They may also provide
- an incentive to cooperate at the international level to reduce our impacts on the global
- climate.

- Temperature related death
- Diarrhoeal diseases
- Dengue
- Malaria
- Risk of death from inland flooding

Housing / Building

- Fungal infestation
- Legionnaires disease
- TB
- B. Asthma
- Lung cancer (Indoor radon)
- Lead exposure
- Home injury
- Mental health

Environmental Burden of Disease Series, No. 1

Introduction and methods

Assessing the environmental burden of disease at national and local levels

Annette Prüss-Üstün
Colin Mathers
Carlos Corvalán
Alistair Woodward

Series Editors
Annette Prüss-Üstün, Diarmid Campbell-Lendrum, Carlos Corvalán, Alistair Woodward

World Health Organization
Protection of the Human Environment
Geneva 2003

Environmental Burden of Disease Series, No. 2

Lead

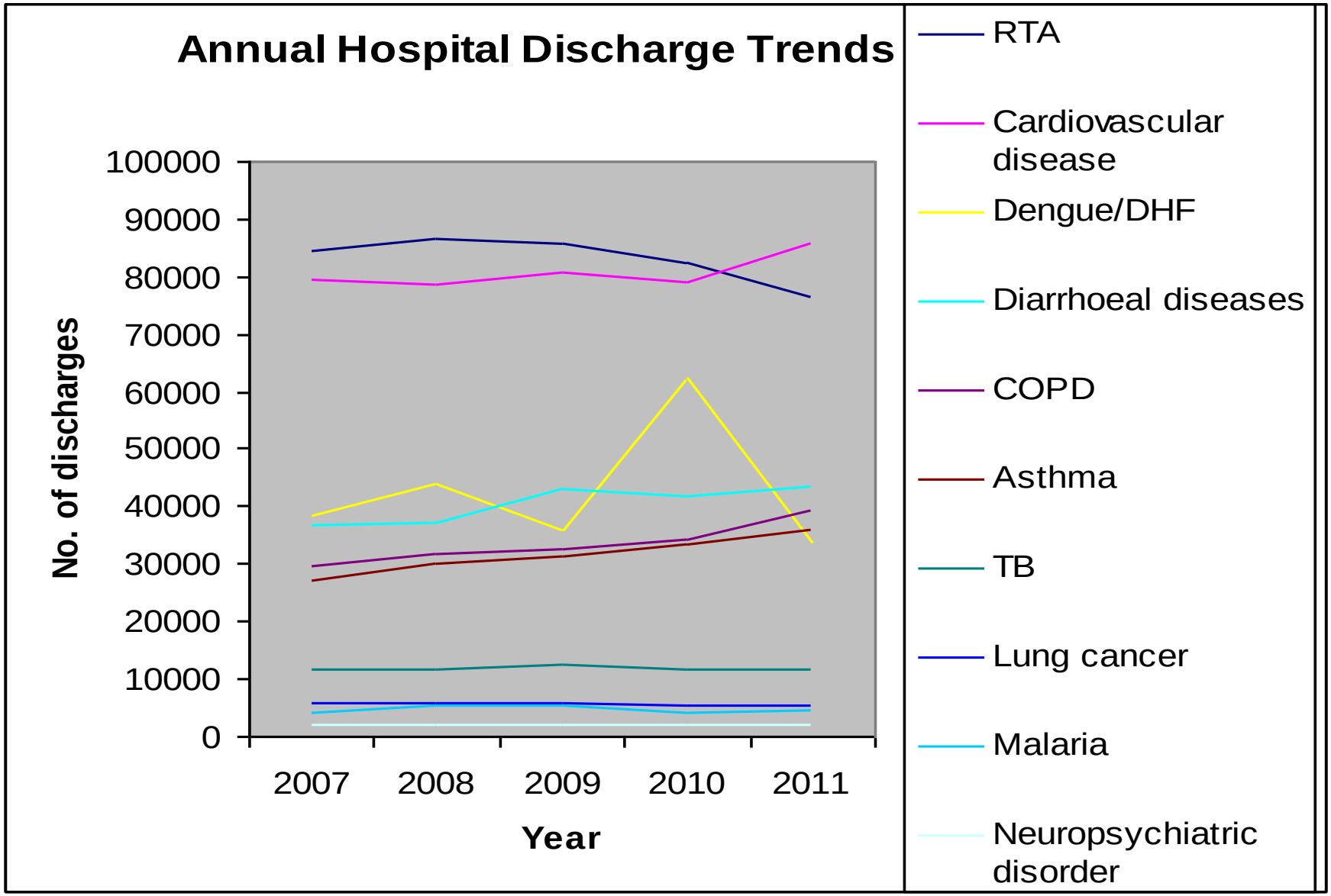
Assessing the environmental burden of disease at national and local levels

Lorna Fewtrell
Rachel Kaufmann
Annette Prüss-Üstün

Series Editors
Annette Prüss-Üstün, Diarmid Campbell-Lendrum, Carlos Corvalán, Alistair Woodward

A Microsoft Excel spreadsheet for calculating the estimates described in this document can be obtained from WHO/PHE e-mail contact: EBDassessment@who.int

World Health Organization
Protection of the Human Environment
Geneva 2003



Data source: PIK KKM

WHO Key facts

- Climate change affects the fundamental requirements for health – clean air, safe drinking water, sufficient food and secure shelter.

- The global warming that has occurred since the 1970s was causing over 140 000 excess deaths annually by the year 2004.

- **Many of the major killers such as diarrhoeal diseases, malnutrition, malaria and dengue are highly climate-sensitive and are expected to worsen as the climate changes.**

- Areas with weak health infrastructure – mostly in developing countries – will be the least able to cope without assistance to prepare and respond.

- Reducing emissions of greenhouse gases through better transport, food and energy-use choices can result in improved health.

WHO Fact sheet N266 2010

Climate sensitive diseases

- Climate sensitive diseases have been identified and reported by Malaysia to the UNFCCC in the Second National Communication (2011)
- Risk of resurgence in vector borne diseases incidence namely **dengue, chikungunya and malaria**.
- Other disease entity relate to food and water borne disease namely **cholera and typhoid**.
- Floodings have also been associated with higher incidence of zoonotic disease namely **leptospirosis**.

Climate sensitive illness*

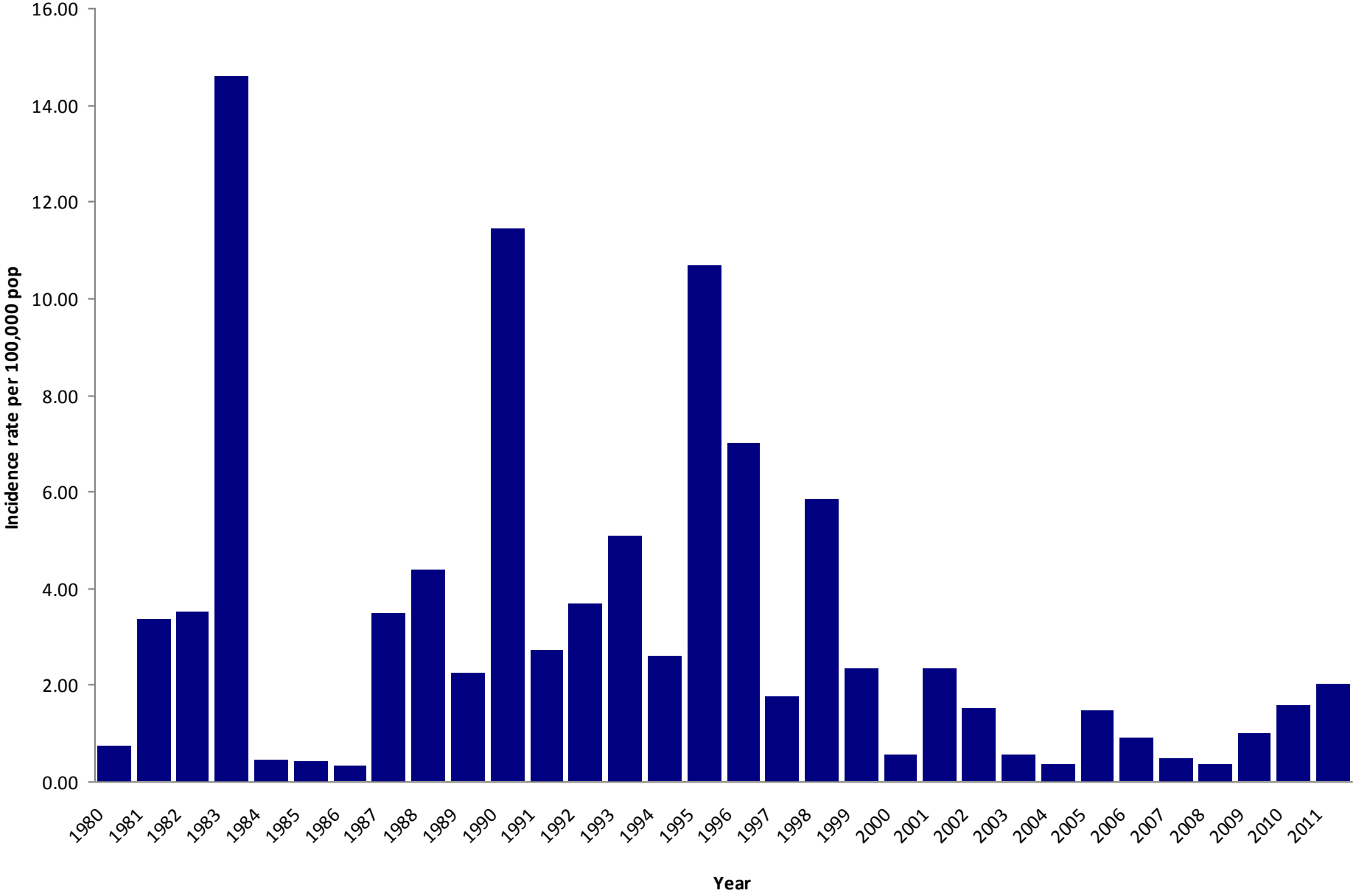
- Food and water-borne diseases
  - Cholera
  - Typhoid
  - Salmonelosis
  - Leptospirosis
  - Hepatitis A
- Vector borne diseases
  - Dengue
  - Chikungunya
  - Malaria

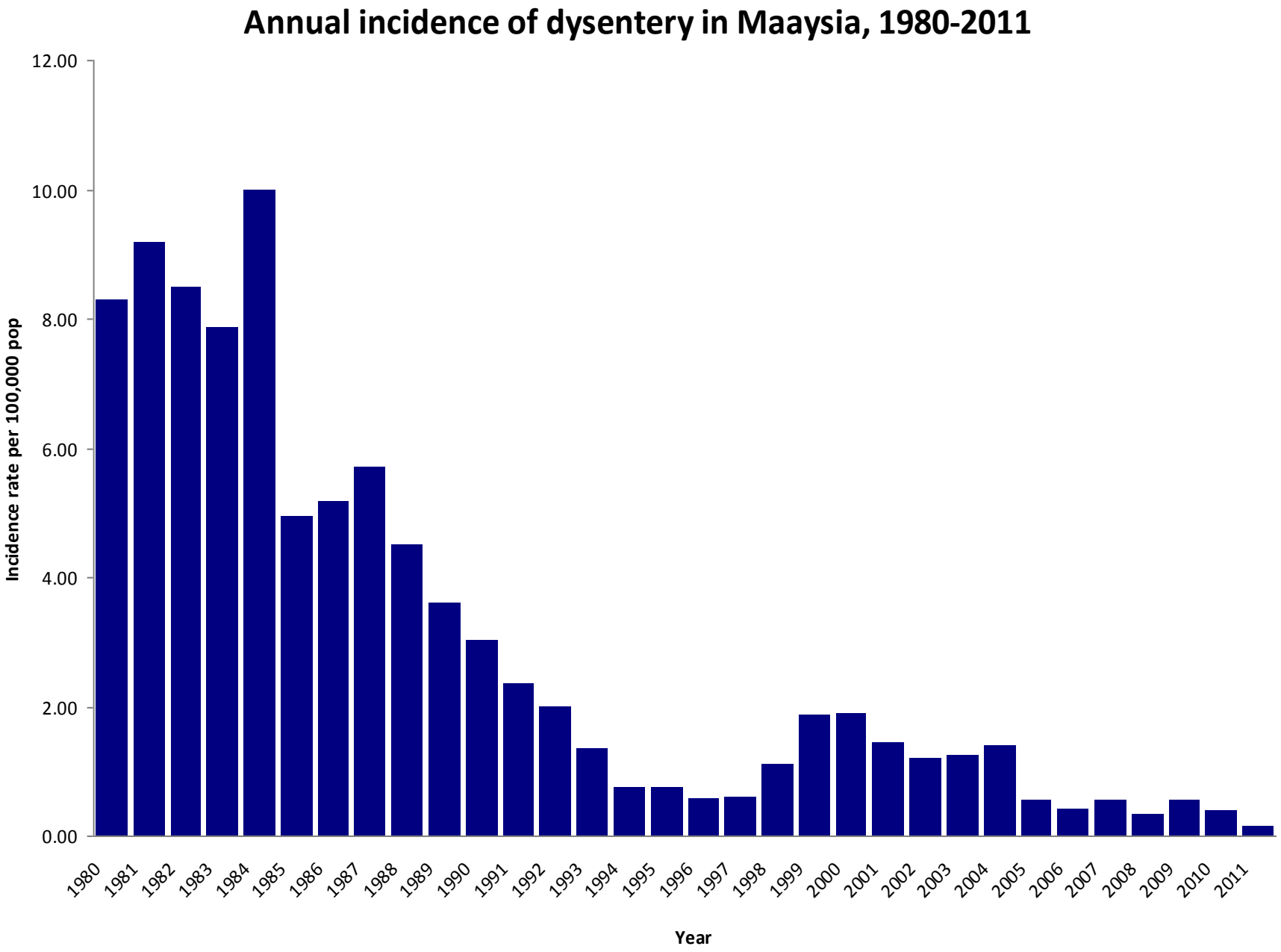
*NC2 Report 2011 for Malaysia

Climate sensitive illness

- Temperature related illnesses
  - Heat exhaustion
  - Heat stress/stroke
  - Hypothermias
- Air-pollution related illnesses
  - ARI / B.asthma / Bronchitis
  - Conjuctivitis
  - Dermatosis

Annual incidence of cholera in Malaysia, 1980-2011




Annual incidence of dysentery in Maaysia, 1980-2011
Incidence rate per 100,000 pop
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2.00
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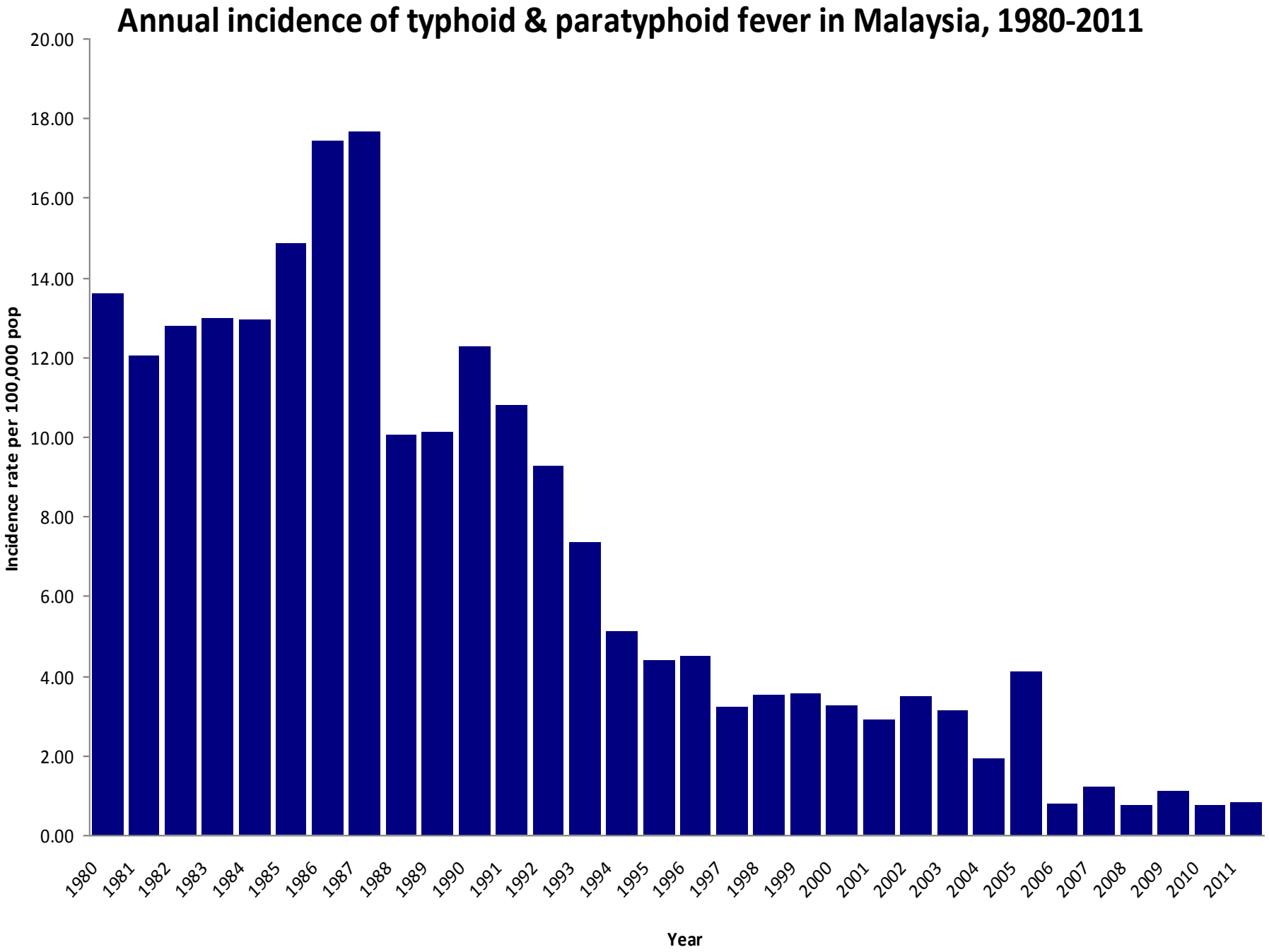
Annual incidence of typhoid & paratyphoid fever in Malaysia, 1980-2011
Incidence rate per 100,000 pop
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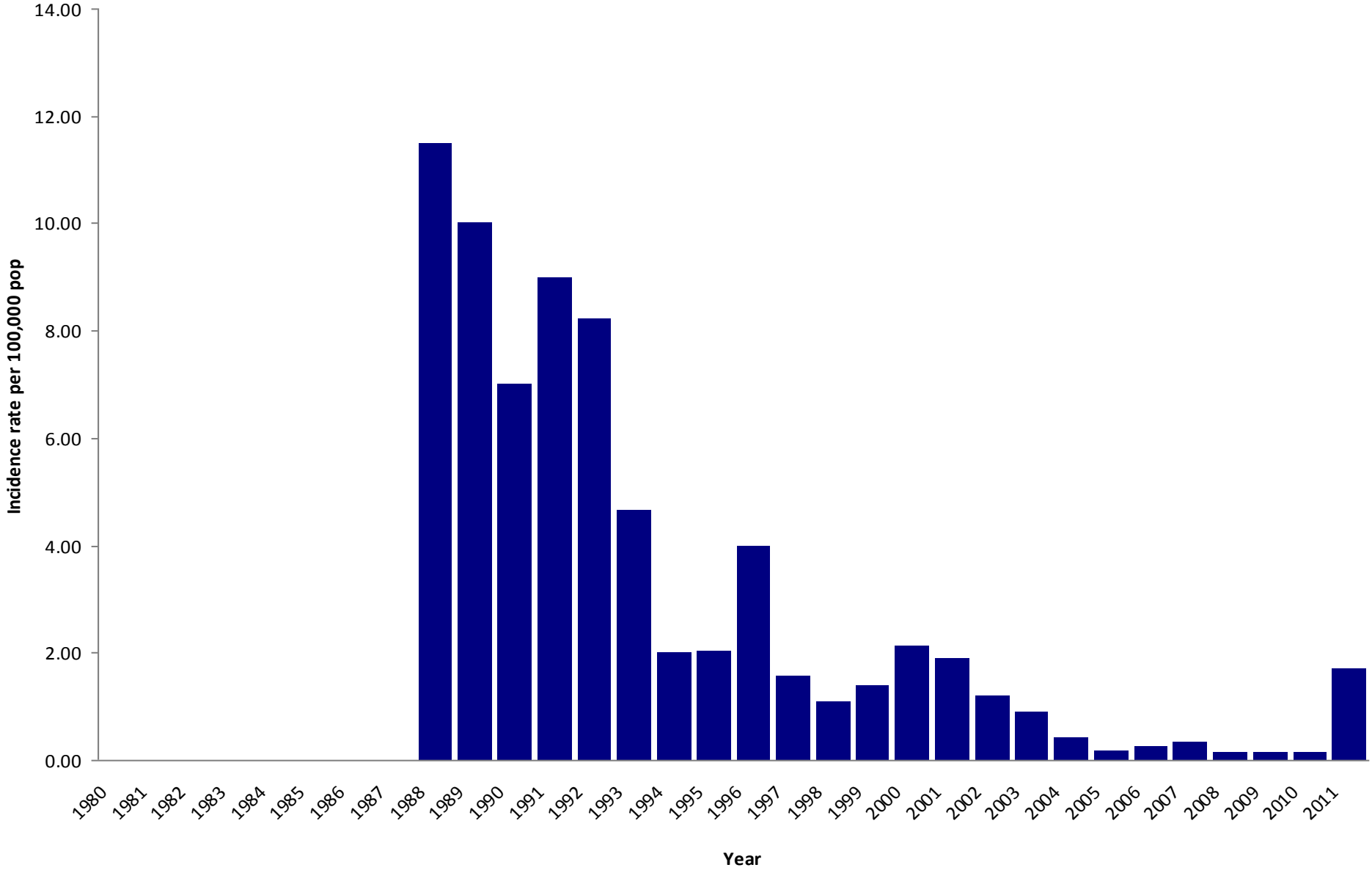
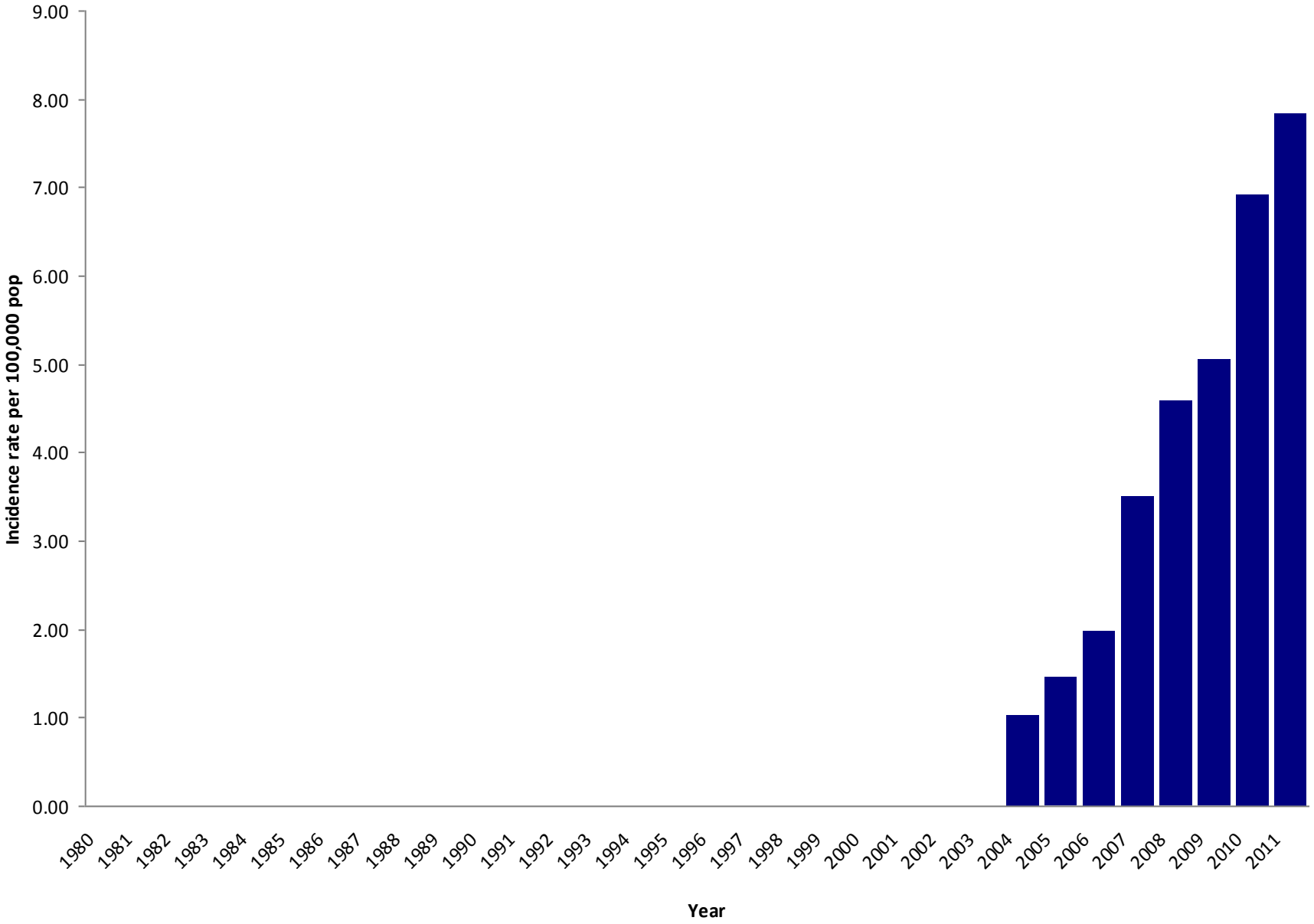
Annual incidence of hepatitis A in Malaysia, 1988-2011




Annual incidence of leptospirosis in Malaysia, 2014-2011
Incidence rate per 100,000 pop
9.00
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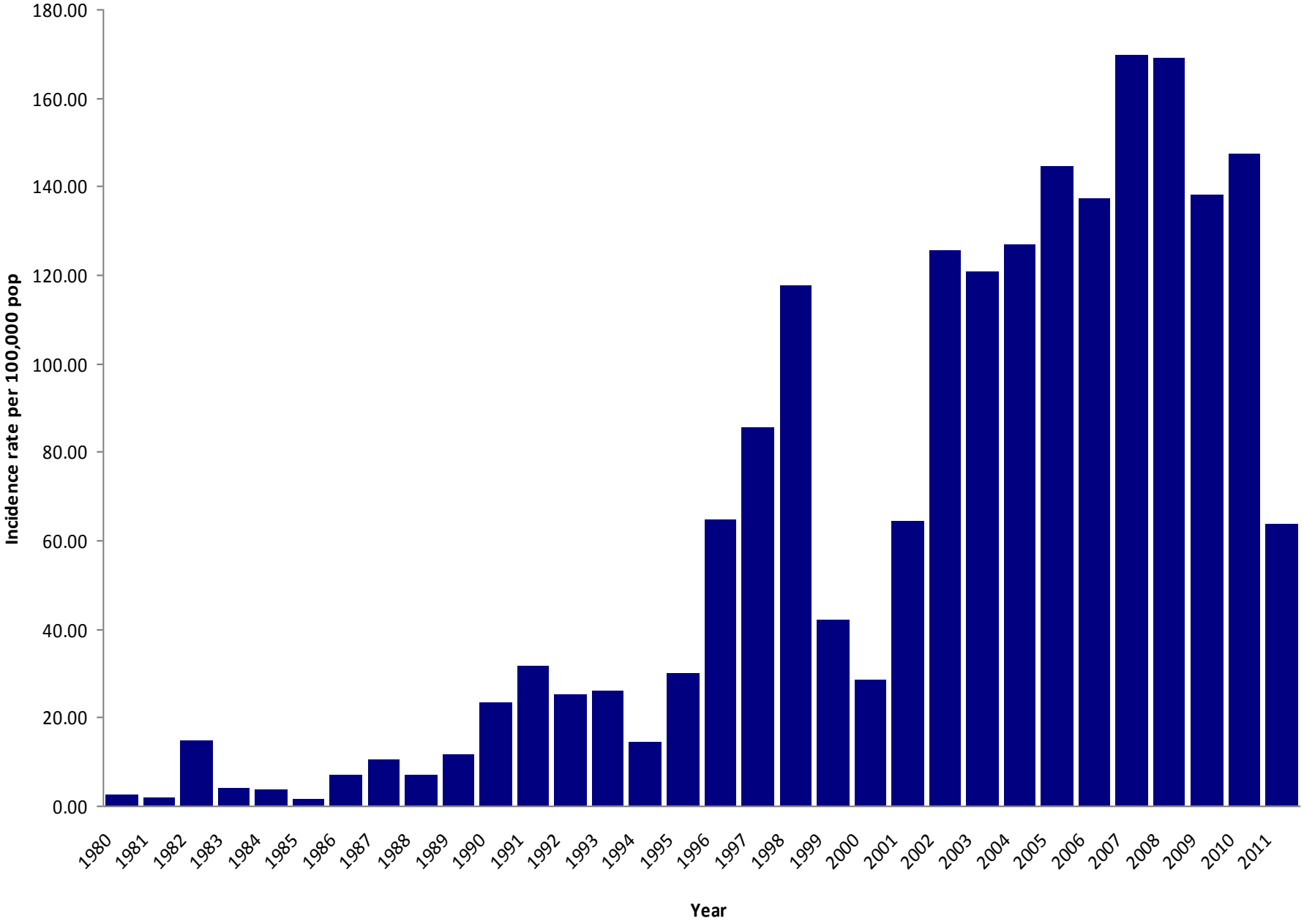
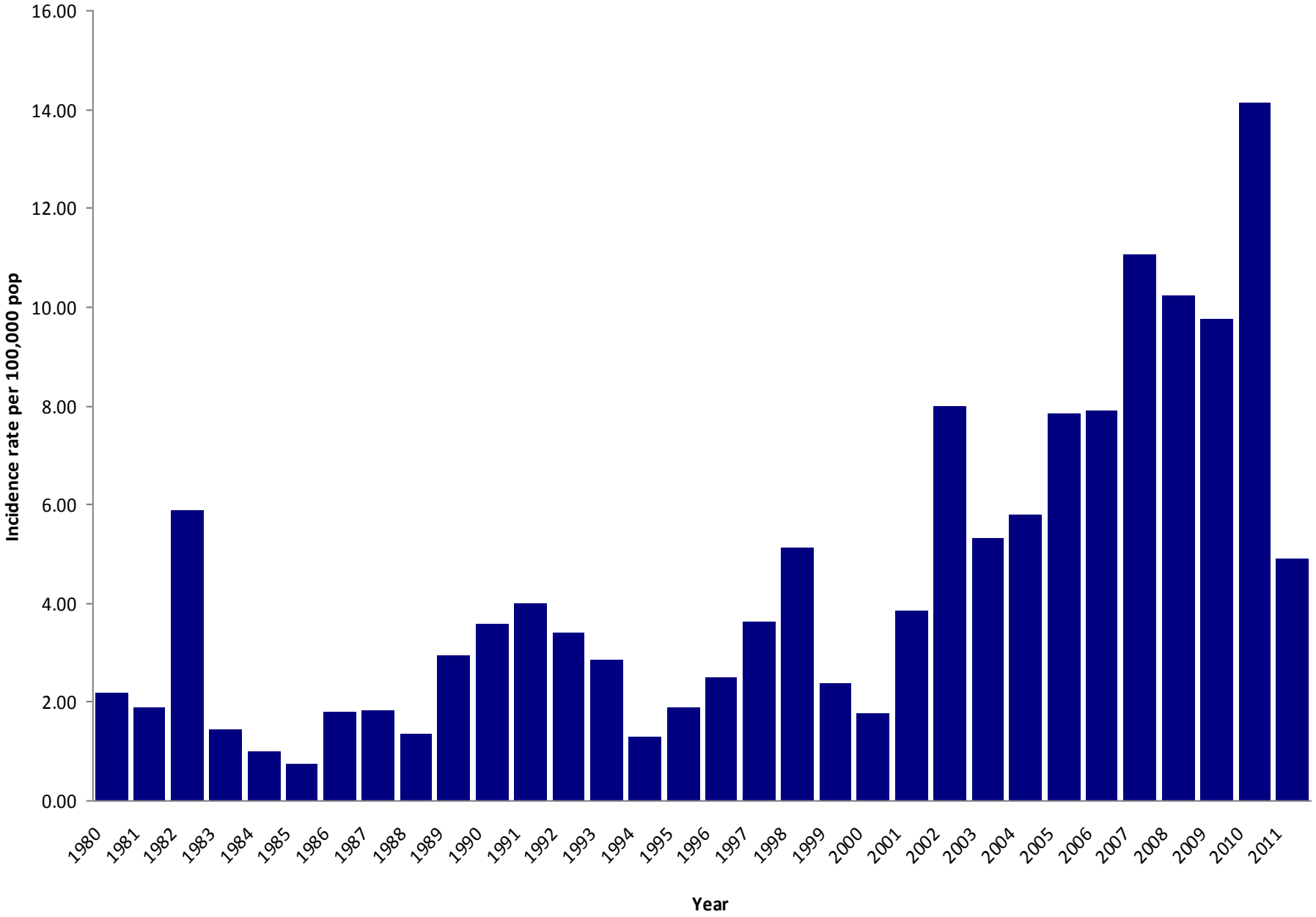
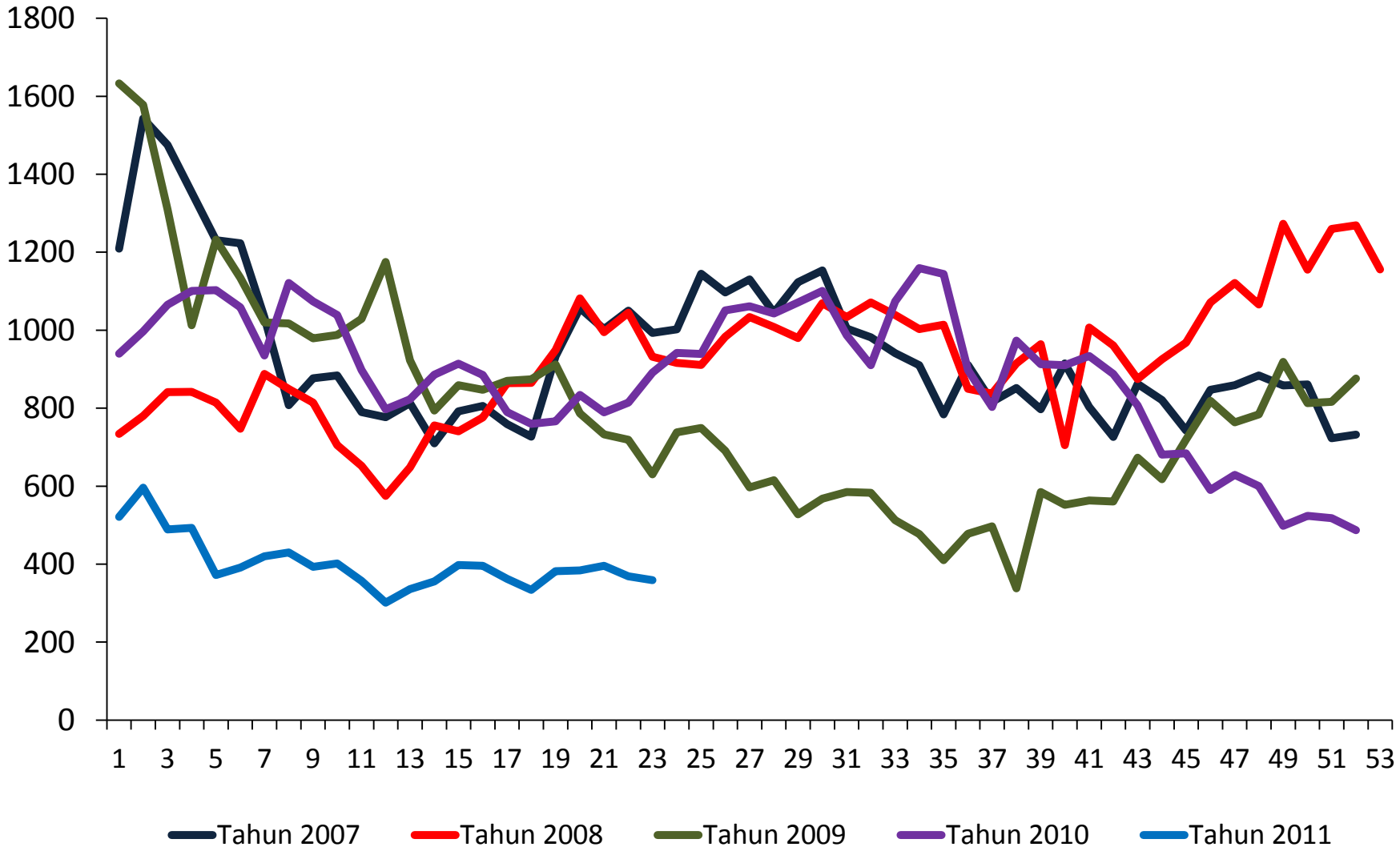
Annual incidence of dengue fever in Malaysia, 1980-2011



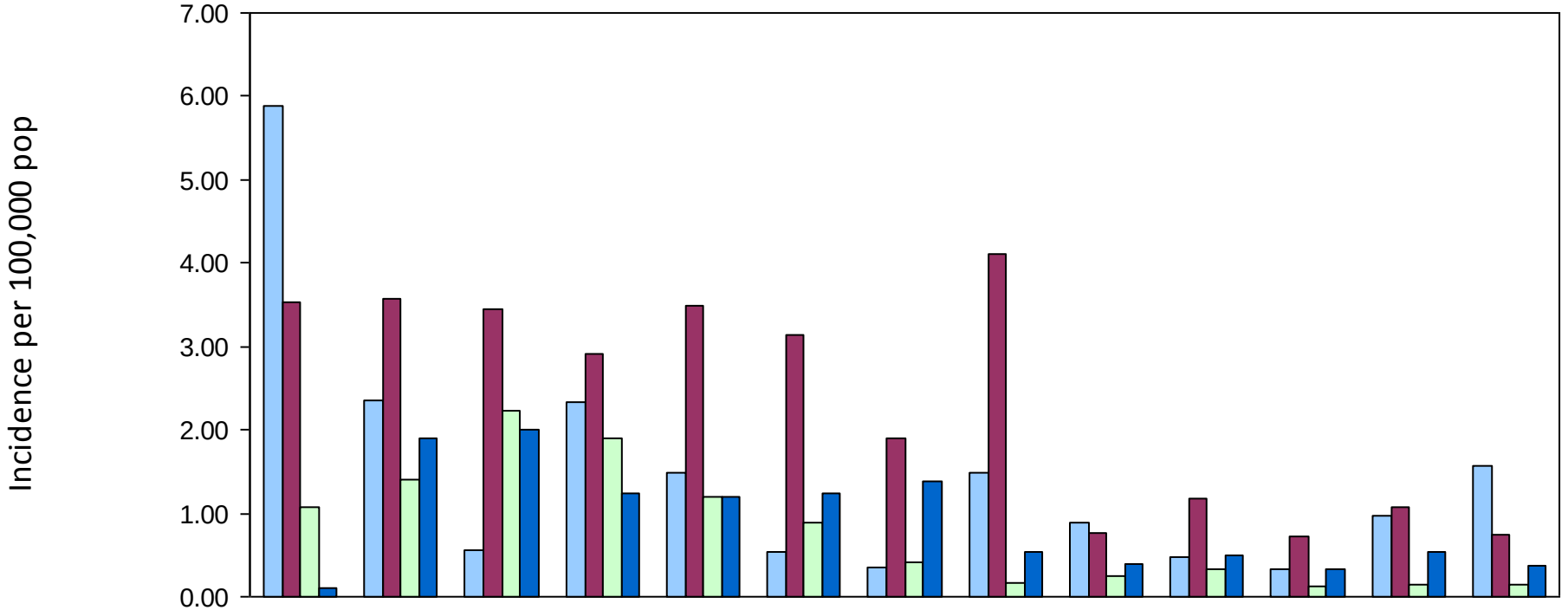
Annual incidence of dengue haemorrhagic fever in Malaysia, 1980-2011



Tren kes Denggi mengikut Minggu Epid bagi tahun 2007 - 2011



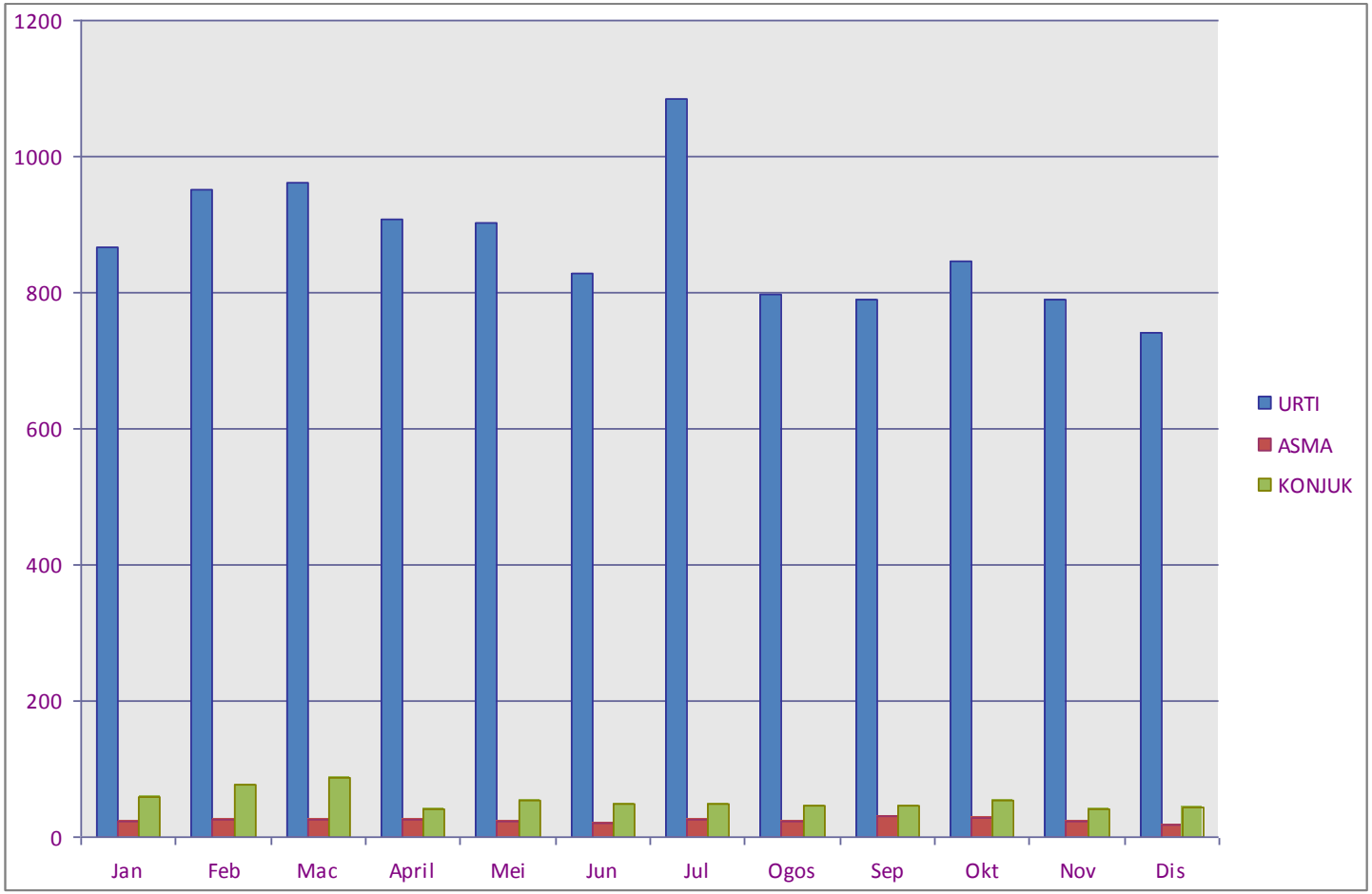
Annual Incidence of Food Water Borne Diseases in Malaysia, 1998 - 2010



	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Kolera	5.88	2.36	0.56	2.34	1.49	0.54	0.35	1.48	0.89	0.48	0.34	0.98	1.57
Tifoid/paratifoid	3.53	3.57	3.45	2.92	3.48	3.13	1.89	4.10	0.77	1.17	0.72	1.07	0.74
Hepatitis A	1.08	1.40	2.24	1.90	1.20	0.89	0.42	0.17	0.24	0.33	0.13	0.14	0.14
Disentri	0.11	1.89	2.01	1.24	1.19	1.24	1.39	0.54	0.39	0.50	0.33	0.54	0.37

Data source MOH, Malaysia

Monthly Sentinel Surveillance, KK Tengkera, 2012



EPI 2012

Environmental Performance Index and Pilot Trend Environmental Performance Index

Full Report

Yale Center for Environmental Law and Policy, Yale University
Center for International Earth Science Information Network, Columbia University

In collaboration with
World Economic Forum, Geneva, Switzerland
Joint Research Centre of the European Commission, Ispra, Italy

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Report and additional materials available at the EPI website: ***www.epi.yale.edu***

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The 2012 EPI ranks 132 countries on 22 performance indicators in the following ten policy categories:

- Environmental Health
- Water (effects on human health)
- Air Pollution (effects on human health)
- Air Pollution (ecosystem effects)
- Water Resources (ecosystem effects)
- Biodiversity and Habitat
- Forests
- Fisheries
- Agriculture
- Climate Change

Appendix I: Indicator Profiles

The following indicator profiles provide metadata on data sources, methods, transformations, and targets. The profiles are organized alphabetically by indicator code as follows:

Objective	Policy Category	Indicator	Indicator code
Environmental Health	Air pollution (effects on human health)	Indoor air pollution	INDOOR
		Particulate matter	PM25
	Water (effects on human health)	Access to drinking water	WATSUP
		Access to sanitation	ACSAT
	Environmental burden of disease	Child mortality	CHMORT
Ecosystem Vitality	Air pollution (effects on ecosystem)	Sulfur dioxide emissions per capita	SO2CAP
		Sulfur dioxide emissions per GDP	SO2GDP
	Water (effects on ecosystem)	Change in water quantity	WATUSE
	Biodiversity and habitat	Biome protection	PACOV
		Marine protection	MPAEEZ
		Critical habitat protection	AZE
	Forests	Forest loss	FORLOSS
		Forest cover change	FORCOV
		Growing stock change	FORGROW
	Fisheries	Coastal shelf fishing pressure	TCEEZ
		Fish stocks overexploited	FSOC
	Agriculture	Agricultural subsidies	AGSUB
		Pesticide regulation	POPs
	Climate change	CO2 emissions per capita	CO2CAP
		CO2 emissions per GDP	CO2GDP
		CO2 emissions per electricity generation	CO2KWH
		Renewable electricity	RENEW

Indicators in Practice: How Environmental Indicators are Being Used in Policy and Management Contexts

Alex de Sherbinin, Aaron Reuben, Marc A. Levy, and Laura Johnson

2013

Center for International Earth Science Information Network
EARTH INSTITUTE | COLUMBIA UNIVERSITY

Yale Center for Environmental Law & Policy

Contents

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6. Malaysia Case Study

Environmental Quality Indicators of Malaysia

After a self-assessment study of the 2010 Environmental Performance Index results for Malaysia, policy and academic stakeholders recognized the need to assess performance and address the growing importance of environmental sustainability in the new economic model of Malaysia through gathering and developing important environmental indicator data.

Malaysia's self-assessment study was conducted by the Ministry of Natural Resources and Environment in collaboration with the University of Teknologi Malaysia in response to Malaysia's scores and rankings in the global Environmental Performance Index. Following the assessment and recognition of the need to address issues related to sustainability, the Department of Environment (DOE) of Malaysia has developed several programs to monitor, collect, and distribute important data related to environmental performance to help ensure sustainable development through a process of nation building. These programs are aimed at providing valuable information to improve awareness and monitor change over time. The Environmental Quality Indicators (hereafter "EQI") was initiated as a program to monitor air, water, and marine quality. Monitoring stations throughout Malaysia were strategically chosen and implemented for this program.

Asia & Pacific

Region EPI Rank	Country	Region Trend EPI Rank
1	New Zealand	12
2	Japan	14
3	Malaysia	6
4	Brunei Darussalam	21
5	Taiwan	7
6	Thailand	1
7	Nepal	4
8	Philippines	9
9	South Korea	3
10	Australia	18
11	Singapore	8
12	Sri Lanka	2
13	Cambodia	10
14	Myanmar	11
15	Indonesia	15
16	Viet Nam	17
17	Mongolia	13
18	Bangladesh	5
19	China	20
20	Pakistan	16
21	India	19