Global health

- ✓ Emerging and re-emerging infectious diseases
- ✓ NTDs
- ✓ Migrant health

1

"The conquest of tuberculosis" Selman Waksman, 1964

"But most important, the ancient foe of man, known as consumption, the great white plague, tuberculosis, or by whatever other name, is on the way to being reduced to a minor ailment of man. The future appears bright indeed, and the complete eradication of this disease is in sight."

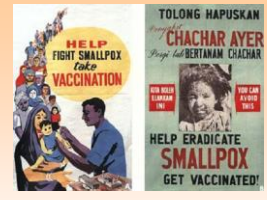
2

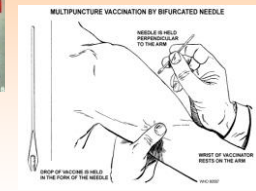
Great achievements in the 70s

- In 1967, when WHO started smallpox eradication campaign, the disease threatened 60% of world population, killed 1 out of 4 patients, left scarred or blind most of people who survived and evaded any kind of treatment

3

1967 -Smallpox vaccination campaign begins





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1979 -Smallpox eradicated!

We, the members of the global commission for certification of smallpox eradication, certify that smallpox has been eradicated from the world.

Geneva, December 9, 1979

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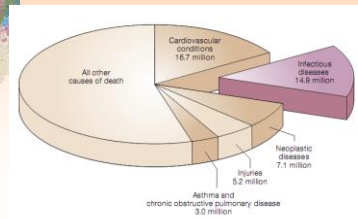
Infectious diseases today

- Approx 57 million people die worldwide annually → of that some 14.82 million are infectious disease deaths (26%) → most of that are in people under the age of 50



Infectious diseases	Annual deaths (million)
Respiratory infections	3.96
HIV/AIDS	2.77
Diarrhoeal diseases	1.80
Tuberculosis	1.56
Vaccine-preventable childhood diseases	1.12
Malaria	1.27
STDs (other than HIV)	0.18
Meningitis	0.17
Hepatitis B and C	0.16
Tropical parasitic diseases	0.13
Dengue	0.02
Other infectious diseases	1.76

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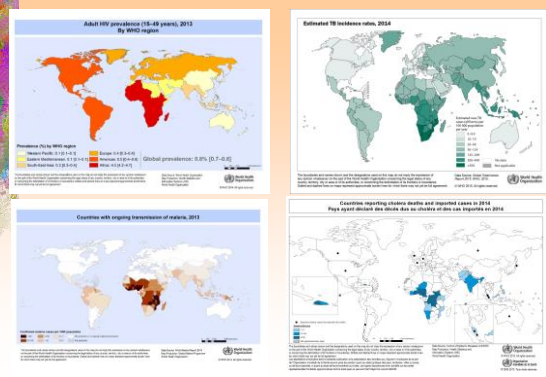
Distribution of some infectious diseases



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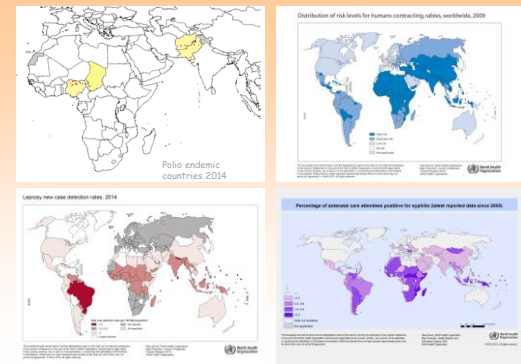

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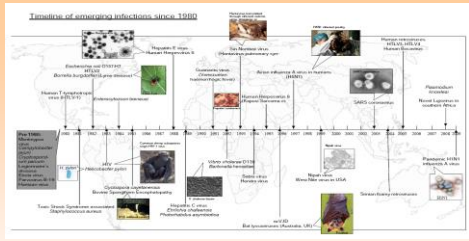
CDC definition



An emerging infection is a new, reemerging or drug-resistant infection whose incidence in humans has increased within the past three decades or whose incidence threatens to increase in the near future

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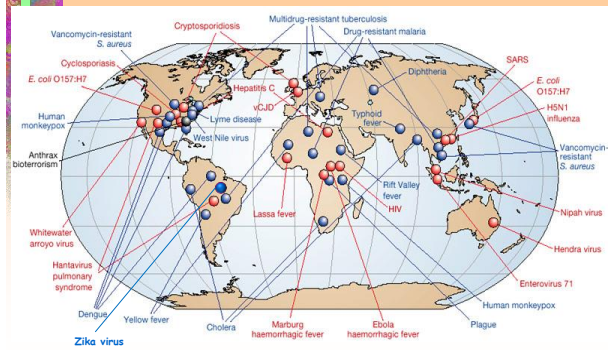
Emerging and re-emerging infectious diseases



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Definitions

- **Emerging disease** is a disease that has never been recognized in man before
  - » E.g., HIV/AIDS, SARS, variant Creutzfeld-Jakob disease (vCJD)
- **Re-emerging diseases** are those that have been around for decades or centuries, but now are either rapidly increasing in incidence or have come back in a different form, geographical location, or human host range, or with a new drug-resistant pattern
  - » E.g., West Nile virus in the Western hemisphere, monkeypox in the US, dengue, MDR TB, Zika virus
- **Deliberately emerging diseases** are those that are intentionally introduced → agents of bioterror (anthrax?)

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WHY??

- Emergence of infectious disease results from dynamic interactions between rapidly evolving infectious agents and changes in the environment and in host behaviour that provide such agents with favourable new ecological niches

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Factors responsible for the emergence of infectious diseases

- Environmental changes and agricultural development
- Changes in human demographics and behaviour
- International travel and commerce
- Technology and industry
- Microbial adaptation and change
- Breakdown of public health measures

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Environmental changes

- Agricultural changes
  - » Deforestation
  - » Reforestation
- Changes in water ecosystems
- Flood/drought
- Global warming

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Agricultural changes

- Increased possibility for agents to breach species barrier between animals and humans because of:
  - » animal displacement in search of food after deforestation
  - » animals forced into closer human contact
  - » humans penetrating or modifying unpopulated regions and coming closer to animal reservoirs or vectors

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Agricultural changes 1

- Conversion of grassland
- to mais cultivation

- Rodents come to people and
- people go to rodents

- Rodents are natural
- reservoir of virus

- Argentine Haemorrhagic
- fever in humans

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Agricultural changes 2

- Increased rice cultivation
  - in South East Asia
- Increased human contact
  - with Field mouse
- Field mouse is natural reservoir
  - of Hantaan virus
- Introduction of Korean haemorrhagic
  - fever in humans

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Reforestation

- Reforestation in USA
- Increased number of deer
  - and deer ticks
- Increased human contact
  - with deers
- Deer ticks are natural reservoir
  - of Lyme disease
- Human affection by Lyme disease

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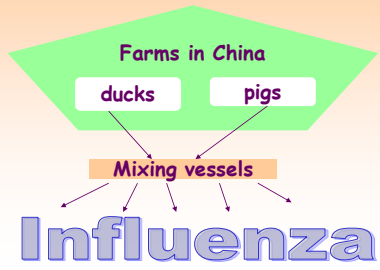
Transmission of infectious agents from animals to humans

- Emerging influenza infections in humans associated with farming conditions



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Changes in water ecosystems

- High Dam in Egypt (Assuan)
  - » slowed water flow
  - » snails allowed to go north
  - » S. mansoni introduced in Upper Egypt
  - » occurrence increased in delta of Nile
- Senegal dam
  - » Lakes in Mauritania
  - » Rift Valley Fever outbreak 1987

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Global warming

- Elevated rainfall
  - » creates new breeding habitats for mosquitoes
  - » decreases salinity which can increase toxic bacteria
  - » increases vegetation which raises rodents
  - » amplifies runoff into drinking reservoirs
- Higher ocean temperatures increase Vibrio parahaemolyticus growing in shellfish
- Some soil pathogens are carried by dry dusty winds (Coccidiodes)

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Human demographic and behaviour

- Population growth and migration
- Urban decay
- Use of high-density facilities (e.g., prisons, day care)
- Economic impoverishment
- War or civil conflict
- Famine
- Sexual behaviour
- Drug use
- Diet
- Outdoor recreation

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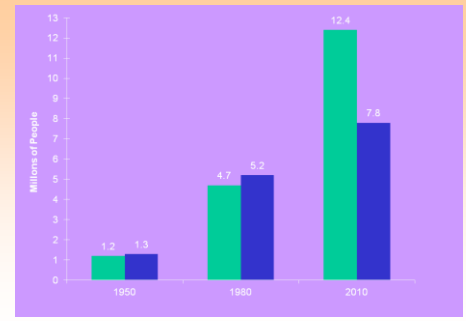
Urban Growth in Asian[1] and American[2] Cities, 1950-2010



1. Mean population of Dhaka, Bangkok, Jakarta, Manila and Saigon.
2. Mean population of Rio de Janeiro, Sao Paulo, San Juan, Caracas and Guayaquil.

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Urbanization

- Increased population density in urban areas
- Basic services may be strained or unavailable in inner city slums or in shanty towns on the periphery
  - » clean water supplies
  - » sanitary conditions
  - » sewage disposal
  - » adequate housing
  - » …

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Urbanization

- Fast paced lifestyles and more stress
- Elderly population increased
- Increase in children in daycare: working women with kids under 5 was 30% in 1970, 75% in 2000
- Increase in high-density facilities (such as prisons, daycare, homeless shelters, etc.)

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Poverty, Neglect

- Poor populations- major reservoir and source of continued transmission
- Malnutrition
- Substandard housing → indoor air pollution (>10% preventable ill health)
- Increase in the number of homeless people in large cities

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War and famine

- Closely linked
- Famine may also be caused by social, economic and political forces, weather emergencies and diseases
- World refugees 2014: nearly 22 millions
- Forced onto new areas where they are exposed to new microbes from vectors and people

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Refugee

- *Who, owing to wellfounded fear of being persecuted for reasons of race, religion, nationality, membership of a particular social group or political opinion, is outside the country of his nationality and is unable or, owing to such fear, is unwilling to avail himself of the protection of that country; or who, not having a nationality and being outside the country of his former habitual residence as a result of serious events, is unable or, owing to such fear, is unwilling to return to it.*

Geneve Convention (art. 1) - 1951

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Human behaviour

- Unsafe sexual practices
  - » HIV, gonorrhoea, syphilis, hepatitis
- High-risk behaviour
  - » drug use
- Outdoor activity

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The global air network

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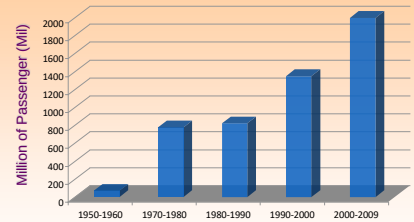
Average annual number of global airline passengers by decade, 1950-2010



IATA 2010

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International travel

- 365 days to circumnavigate the globe …
- … now it takes 36 hours
- Used to quarantine ships, but 36h is faster than disease incubation
- 400 million people per year travel internationally
- increased incidence of both tuberculosis and influenza transmission on long flights

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Disease and trade-interwoven history

- 14th century: Europe discovers exotic goods from Asia
  - » Silk route
    - – and plague
- 18th, 19th, 20th centuries, global trade flourishes
  - » Slaves trade
    - – and yellow fever
  - » Migration to new world
    - – and smallpox
- New millennium, integrated global economic system with a transnational flow of knowledge, capital, products, people, animals, and pathogens
  - » Travel
    - – and HIV/AIDS
  - » Hajj pilgrimage
    - – and cholera, typhoid, meningitis

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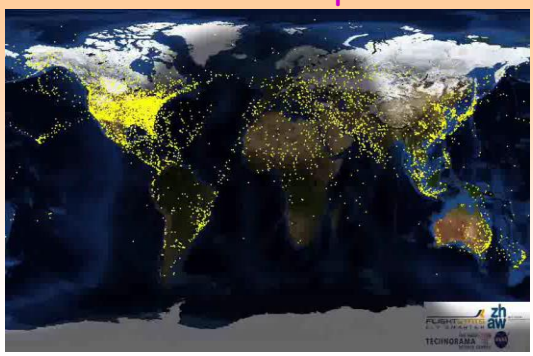
Commercial air traffic over a 24 hour period



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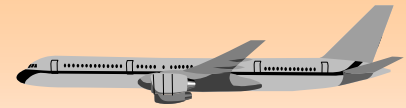
Travel and commerce



- Transportation of products is an increased concern
- Rapid transport of disease harboring fresh products
- Transport of livestock facilitates movements of viruses and arthropods (especially ticks)

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Recently importing into the US:

Animals

- 47,000 mammals
- 379,000 birds
- 2 million reptiles and poisonous snakes
- 49 million amphibians
- 223 million fish

Mosquitoes

- Aedes albopictus
- Ochlerotatus (A. Finlaya) togoi
- Ochlerotatus (A. Finlaya) japonicus
- Aedes bahamensis
- Culex biscayensis

Infectious diseases

- West Nile fever
- Dengue fever
- Yellow fever
- Mayaro fever
- Chikungunya
- Epidemic polyarthritis
- SARS
- Influenza
- Lassa fever
- Monkeypox
- CJD/BSE
- HIV/AIDS
- Cholera
- E. coli O157
- E. coli O104:H4
- Malaria
- Leishmaniasis
- Chagas disease
- Cyclospora
- Zika

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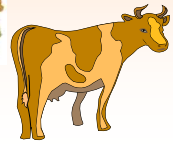
Food production

- Changes in food processing, packaging, and preparation
- Modern mass production increases the chance of accidental contamination and especially amplifies the effect of such contamination
  - » Contamination of hamburger meat by E. coli strains causing haemolytic uraemic syndrome
  - » Feeding cattle with byproducts of sheep causing bovine spongiform encephalitis
  - » Contamination of sprouted foods by Escherichia coli O104: H4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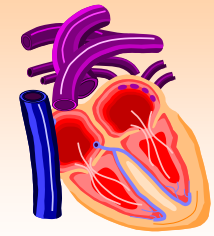
Health care

- New medical devices
- Organ or tissue transplantation
- Drugs causing immune suppression
- Widespread use of antibiotics



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Health care

- People living longer, but with weaker immune systems
- Blood and organ transplantation may transmit infections
- Concentrating effect of blood and nosocomial infections
- New diagnostic technology leads to identification of previously unknown microbes for known diseases
  - » Helicobacter pylori and peptic ulcer
  - » Human herpes virus 6 and roseola infantum
  - » …

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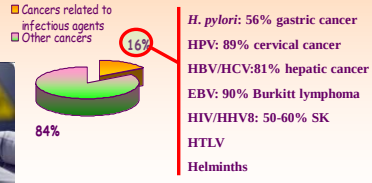
Microbial adaptation and change

- Changes in virulence and toxin production, species jumping from animals to humans
- Microbes as cofactors in chronic diseases
- Development of drug resistance



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Antibiotic resistance

- Antibiotic-resistant bacteria are emerging from the environment in response to the wide distribution of antimicrobials
- Selection for antibiotic-resistant bacteria and drug-resistant parasites have become common, generated by the wide and often unsuitable use of antimicrobial drugs

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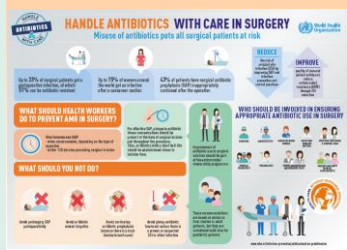
World Antibiotic Awareness Week 12 to 18 November 2018



http://www.who.int/who-campaigns/world-antibiotic-awareness-week

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An example

- The use of unsupervised prophylactic tetracycline administration to 100,000 pilgrims en route to Mecca from Indonesia is thought to have been significantly responsible for the fact that 50% of cholera strains in that country are now tetracycline resistant

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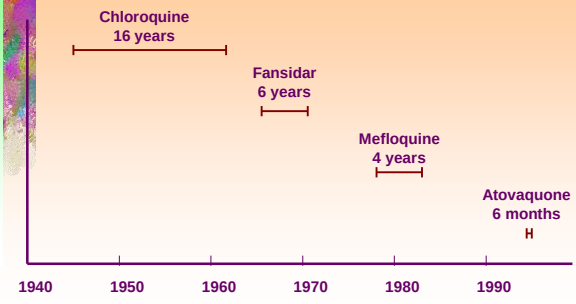
Time to development of resistance to antimalarial drugs



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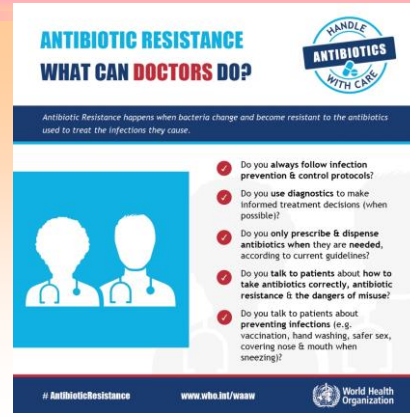

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Public health infrastructure

- Curtailment or reduction in prevention programs
- Inadequate communicable disease surveillance
- Lack of trained personnel
  - » Epidemiologists
  - » Laboratory scientists
  - » Vector and rodent control specialists
  - » Infectious disease specialists

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Possible reasons

- Lack of funding
- Poor prioritization of health funds
- Misplaced in curative rather than preventive infrastructure
- Failure to develop adequate health delivery systems

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Some examples?

- Decrease in choline in water supplies lead to rapid spread of cholera in South America
- Non functioning water plant in Wisconsin lead to outbreak of waterborne Cryptosporidium
- Inadequate vaccinations and diphtheria in former USSR independent countries
- Discontinued mosquito control efforts and dengue and malaria re-emergence

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February 26, 2003

- American man, 48 years old
- Recently been in Shangai and Hong Kong for business
- Hospitalized in Hanoi for fever, cough and myalgias
- Four days later: thrombocytopenia, ARDS, ICU
- March 13: exitus

56

February 28, 2003

- Carlo Urbani, medical doctor for WHO, worrying it could be avian flu, reports the case of atypical pneumonia to the Pacific Regional Office of WHO and starts alert on the new illness
- He will die in Bangkok on March 29, killed by the same disease he had discovered

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SARS

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SARS
Severe Acute Respiratory Syndrome

- WHO definition
  - » *acute disease of unknown aetiology whose main symptoms are high fever, cough, shortness of breath or breathing difficulties, which develops in subjects who have had very close contact with other cases*

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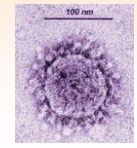
SARS-CoV

- Infects mammalian and birds
- Viral replication inside epithelial cells of respiratory and enteral tract and macrophages
- In man they produce only pathological damages on respiratory (cold), enteric and (rarely) neurological systems



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Mode of transmission

- Most probable:
  - » Close contact
    - "Droplet" (1-1.5 m)
    - Direct (skin contamination)
    - Indirect (contaminated vehicles)
    - Stool/urine
- Possible:
  - » "Airborne": air expired from the patient (very contagious)

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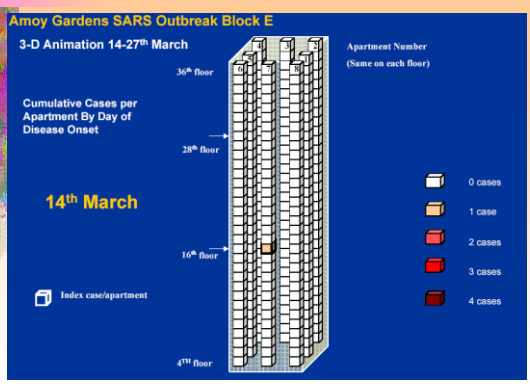
Epidemic cluster "Amoy Gardens" Hong Kong

62



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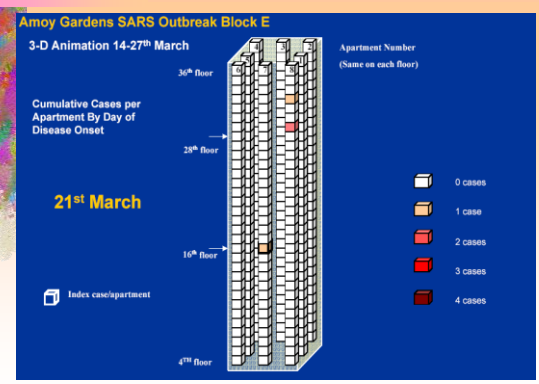

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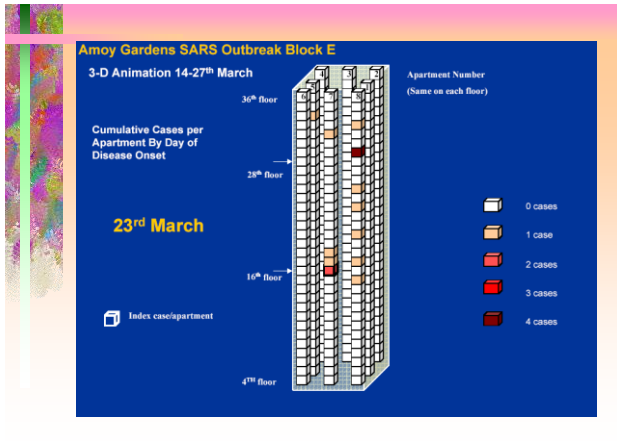
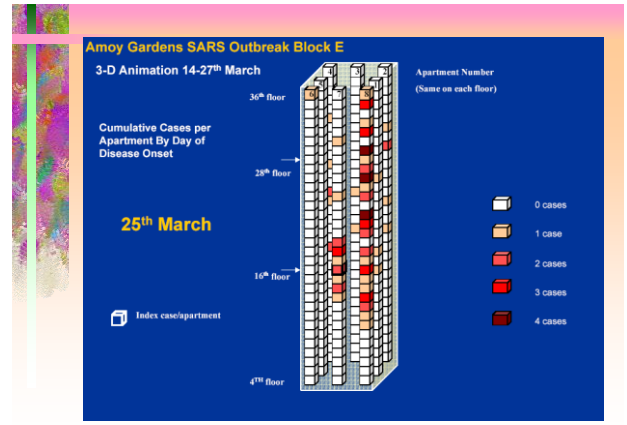
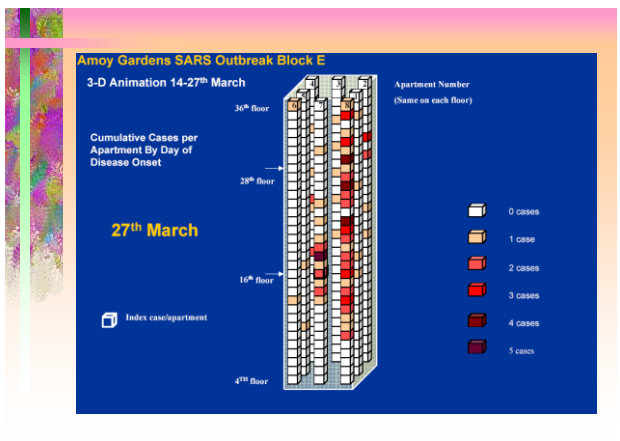

Amoy Gardens SARS Outbreak Block E
3-D Animation 14-27th March
Apartment Number
(Same on each floor)
36th floor
Cumulative Cases per Apartment By Day of Disease Onset
28th floor
23rd March
16th floor
Index case/apartment
4TH floor
0 cases
1 case
2 cases
3 cases
4 cases

65


Amoy Gardens SARS Outbreak Block E
3-D Animation 14-27th March
Apartment Number
(Same on each floor)
36th floor
Cumulative Cases per Apartment By Day of Disease Onset
28th floor
25th March
16th floor
Index case/apartment
4TH floor
0 cases
1 case
2 cases
3 cases
4 cases

66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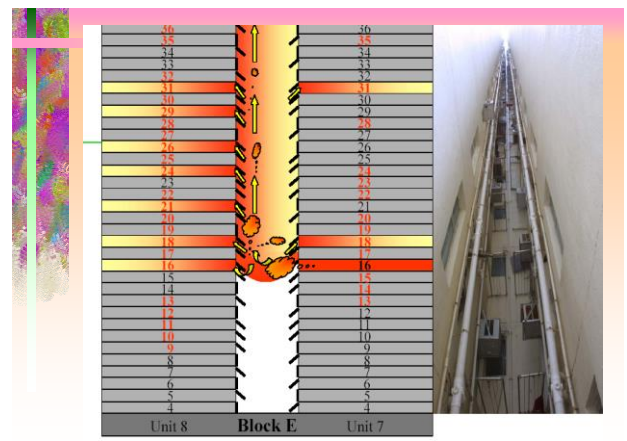
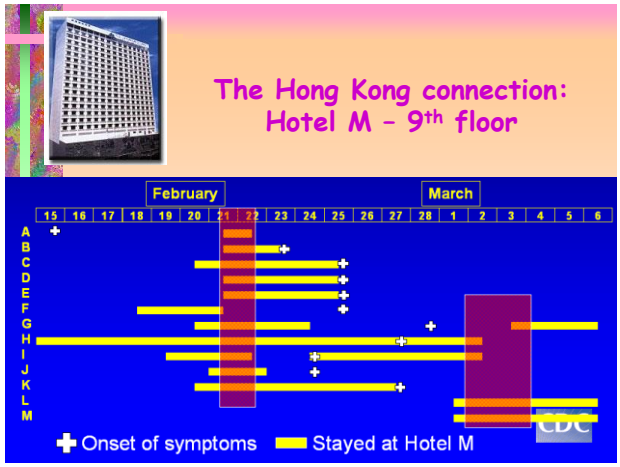
Index case/apartment
4TH floor
0 cases
1 case
2 cases
3 cases
4 cases
5 cases

67


Unit 8
Block E
Unit 7

68



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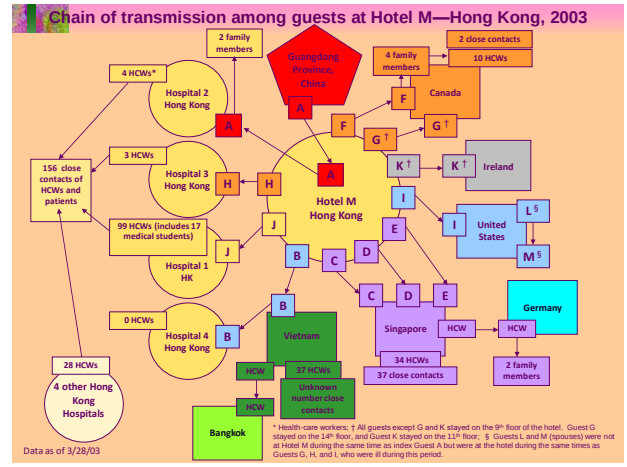

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March 12, 2003

- Due to the raising number of severe atypical pneumonia among health personnel (HCW) in Hanoi and Hong Kong, WHO proclaimed the global state of alert

Global alert and response (GAR)

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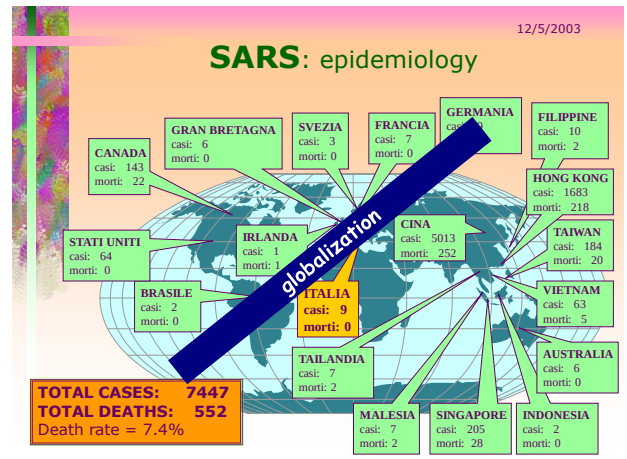

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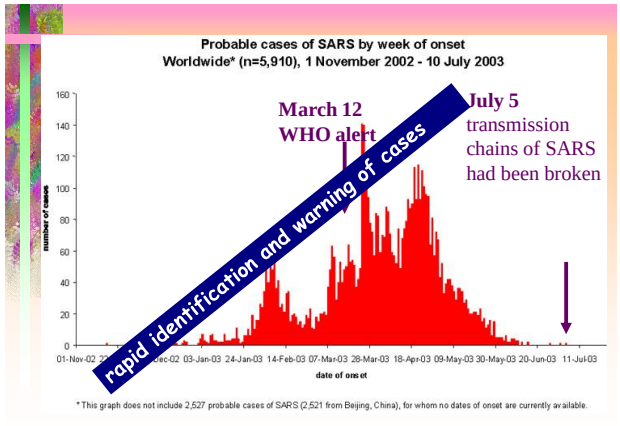

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March 17, 2003

- WHO asks 11 excellence laboratories in 9 countries to build a network for research on SARS
- Laboratories are connected so that their results can be shared in real time
- On a protected WHO website, members of the network share images of the virus, genome sequences and samples from patients

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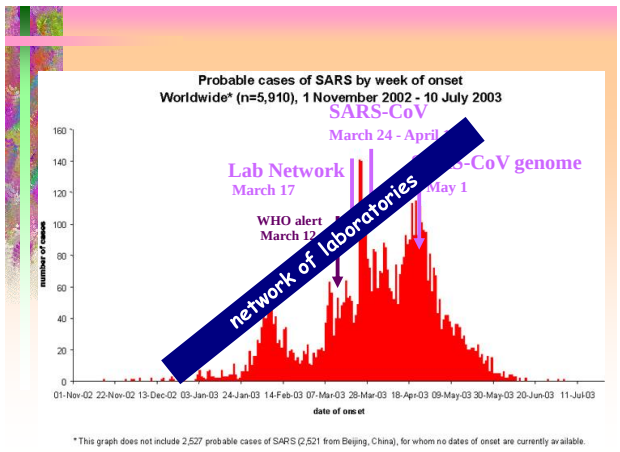

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May 2, 2003

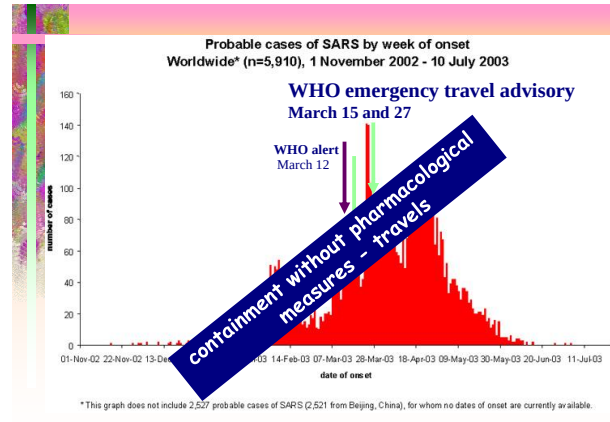
- Xiaotangshan Hospital hosted 156 patients with SARS coming from 15 hospitals in the city of Beijing
- Xiaotangshan Hospital has been built in just 8 days by 7.000 builder

76

Nonpharmaceutical interventions

- Outside of healthcare settings focus on measures to
  - » limit international spread of the virus (e.g., travel screening and restrictions)
  - » reduce spread within national and local populations
    - social distancing measures
    - quarantine
    - isolation and treatment of ill persons

77



78

April 20, 2003

containment without pharmacological measures - quarantine

- In Beijing there [illegible] confirmed SARS cases and 402 suspected [illegible]
  - » Schools [illegible] and strict quarantine measures imposed [illegible]
- In Sing[illegible]luster of cases were discovered among clerks o[illegible] market
  - » The ma[illegible]et was closed for 15 days and sellers put in quarantine at home

79

SARS, Queen Mary Hospital Hong Kong

Crude attack rates/1000 in hospital workers by week of epidemic

full isolation me[illegible]

containment without pharmacological measures - isolation

Rate	6.1	10.2	8.8	[illegible]	0	0
Week	1	2	[illegible]	4	5	6

Ho AS, et al Annals Internal Medicine 2003; 139: 564-7

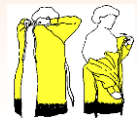
80

Individual protection devices

- Mask
- Gloves
- Coat
- Washing hands

- no HCW infected i… 4 measures were adopted
- all infected H… overlooked at least 1 out of 4 m…sures

information, education and training



81

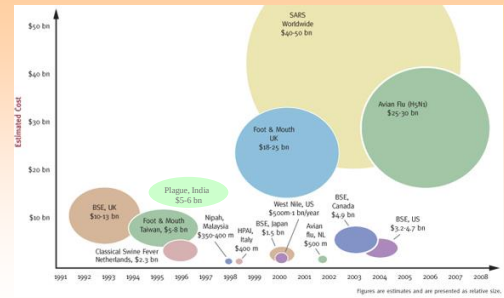
82

Lessons learnt from SARS

1. An infectious disease in one country is a threat to all
2. Important role of air travel in international spread
3. Tremendous negative economic impact on trade, travel and tourism

83

Economic impact of selected infectious diseases



84

Lessons learnt from SARS

4. High level commitment is crucial for rapid containment
5. WHO can play a critical role in catalyzing international cooperation and support
6. Global partnerships and rapid sharing of data and information enhances preparedness and response

85

EBOLA

86

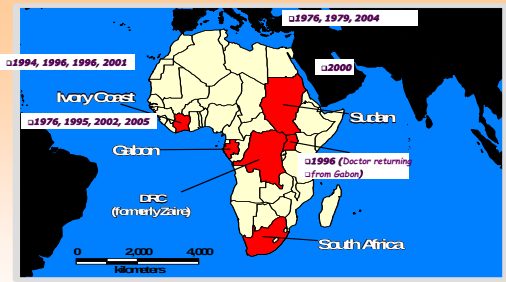
Ebola virus disease (EVD)

- Rare and deadly viral illness (20-90% of cases) caused by infection with one of the 5 Ebola virus strains
- The natural reservoir host is believed to be fruit bats

- Person-to-person transmission through direct contact with
  - » blood or body fluids of a sick person
  - » objects contaminated with the virus
  - » infected fruit bats or primates
  - » sexual transmission
- The disease can spread quickly within healthcare settings when hospital staff are not wearing appropriate personal protective equipment

87

Ebola virus outbreaks

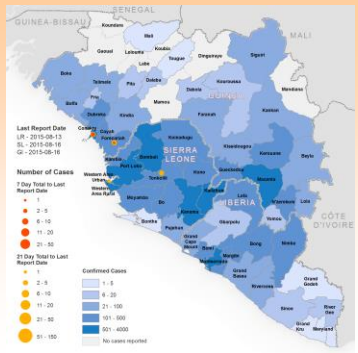


Ebola was first discovered in 1976 near the Ebola River in what is now the Democratic Republic of the Congo

Since then, outbreaks have appeared sporadically in Africa

88

2014 EVD outbreak



89

Clinical features

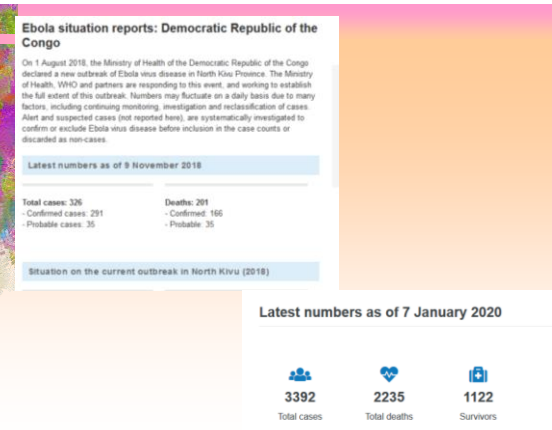
- Incubation period: 2-21 days
- Abrupt onset with:
  - » fever
  - » headache
  - » sore throat
  - » fatigue
  - » diarrhea
  - » vomiting
  - » abdominal pain
  - » bleeding
  - » muscle pain
- Only symptomatic patients spread the disease

90

Prevention measures

- Isolation of patients
- Individual protection devices
- Identification of contacts and surveillance for three weeks

91



92

And then …

… Zika

93

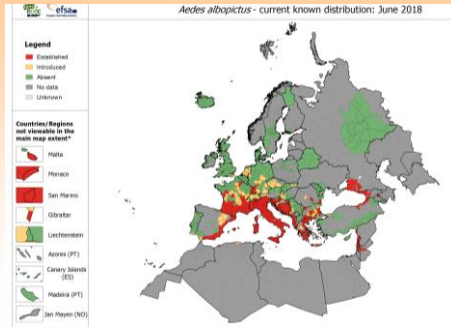
Zika virus

- Flavivirus transmitted by Aedes mosquitoes
- First isolation in Uganda in 1947 from monkeys of Zika forest, near lake Victoria
- First isolation from sick man in Uganda in 1952
- Past epidemics in Africa, the Americas, Asia and the Pacific
- Few imported cases in Europe

94

Transmission

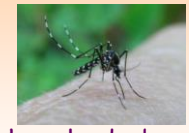
Aedes mosquito bite: A. aegypti and A. albopictus (*zanzara tigre*)



95

Aedes albopictus

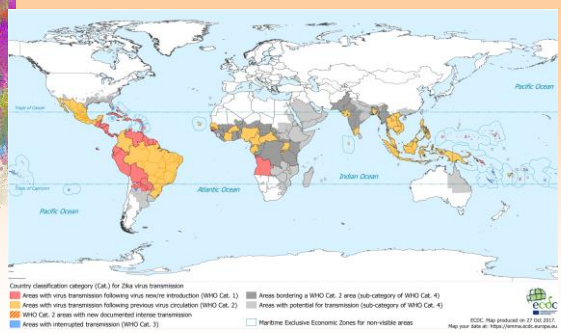
- Mosquitoes live mainly in clean standing water left outside, in containers such as buckets, drums, pots, gutters, and used tyres
- It usually bites during the day, peaking during early morning and late afternoon or evening



- In Italy it has already been responsible for transmission during the small outbreak of Chikungunya virus, which took place between July and October 2007 in Emilia-Romagna and a second outbreak during summer 2017 in Latium

96

Zika transmission



97

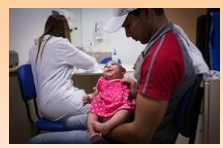
Clinical manifestations

- The incubation period is not clear, but likely to be a few days (2-5)
- Symptoms:
  - » fever
  - » skin rashes
  - » conjunctivitis
  - » muscle and joint pain
  - » malaise
  - » headache
- Symptoms are usually mild and last for 2-7 days
- Based on a systematic review of the literature up to 30 May 2016, WHO has concluded that
  - » Zika virus infection during pregnancy is a cause of congenital brain abnormalities, including microcephaly
  - » Zika virus is a trigger of Guillain-Barré syndrome

98

Microcephaly

- A condition where a baby has a head size much smaller compared with other babies of the same age and sex
- It is a rare condition, caused by a variety of factors: in utero infections, perinatal asphyxia, genetic causes
- Increased number or clustering of cases have been reported with outbreaks of Zika virus infection
- Available evidence points at Zika virus infection during pregnancy as responsible for this abnormality



- Congenital Zika virus syndrome
  - » Includes a range of manifestations of varying severity reported among newborns exposed to Zika virus in utero
  - » Malformations of the head, seizures, swallowing problems, hearing and sight abnormalities
  - » Also possible are miscarriages and stillbirths

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Zika microcephaly cases 2-2-2017

Table 3. Countries and territories that have reported microcephaly and/or CNS malformation cases potentially associated with Zika virus infection

Reporting country or territory	Number of microcephaly and/or CNS malformation cases suggestive of congenital Zika virus infection or potentially associated with a Zika virus infection	Probable location of infection
Argentina	2[a]	Argentina
Bolivia (Plurinational State of)	14[a]	Bolivia (Plurinational State of)
Brazil	2366[a]	Brazil
Cabo Verde	9	Cabo Verde
Canada	2	Undetermined
Colombia	84[b]	Colombia
Costa Rica	2	Costa Rica
Dominican Republic	22[b]	Dominican Republic
El Salvador	4	El Salvador
French Guiana	16[c]	French Guiana
French Polynesia	8	French Polynesia
Grenada	1	Grenada
Guadeloupe	13[b]	Guadeloupe
Guatemala	15[b]	Guatemala
Haiti	1	Haiti
Honduras	2	Honduras
Marshall Islands	1	Marshall Islands
Martinique	16[b]	Martinique
Nicaragua	2[b]	Nicaragua
Panama	5	Panama
Paraguay	1[c]	Paraguay
Puerto Rico	31[c]	Puerto Rico
Slovenia	1[c]	Brazil
Spain	2	Colombia, Venezuela (Bolivarian Republic of)
Suriname	4	Suriname
Thailand	2	Thailand
Trinidad and Tobago	1	Trinidad and Tobago
United States of America	42[a]	Undetermined**
Viet Nam	1	Viet Nam

*The probable location of three of the infections was Brazil (one case), Haiti (one case) and Mexico, Belize or Guatemala (one case).

100

Prevention - Mosquito bites

Cover, empty or clean potential mosquito breeding sites in and around houses

- Avoid mosquito bites by:
  - wearing clothes (preferably light-coloured) that cover as much of the body as possible
  - using physical barriers such as window screens or closing doors and windows
  - sleeping under mosquito nets
  - using insect repellent containing DEET, IR3535 or icaridin

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Prevention - Sexual transmission

- Zika virus can be transmitted through sexual intercourse
- In regions with active transmission of Zika virus
  - people with Zika virus infection and their sexual partners should be informed about the risks of sexual transmission
  - sexually active men and women should be offered contraceptive methods to prevent adverse pregnancy and fetal outcomes
  - pregnant women should practice safer sex or abstain from sexual activity for at least the whole duration of the pregnancy
- In regions with no active transmission of Zika virus
  - men and women returning from areas of active transmission should practise safer sex or abstinence for 6 months
  - sexual partners of pregnant women, living in or returning from areas with transmission of Zika virus should practice safer sex or abstain from sexual activity throughout the pregnancy

102

What will be next?

West Nile Feve

Dengue

...Covid

respiratory coronavirus

(S-CoV)

ussis, Dyphteria, MDR-TB ...

103

The CSSE at Johns Hopkins: Global COVID-19 Dashboard

Updated

Confirmed Cases Global: 48,885,919	Deaths Global: 1,236,707	Recovered Global: 32,309,610
US: 9,623,471	US: 235,056	India: 7,765,966
India: 8,411,724	Brazil: 161,736	Brazil: 5,102,762
Brazil: 5,612,319	India: 124,985	US: 3,781,751
Russia: 1,720,063	Mexico: 93,772	Russia: 1,288,096
France: 1,648,989	UK: 48,210	Argentina: 1,030,137

Last updated: November 6, 2020, 8:24 AM ET

Dong. Lancet Infect Dis. 2020;20:533. https://coronavirus.jhu.edu/map.html

Slide credit: clinicaloptions.com

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- https://coronavirus.jhu.edu/map.html
- http://opendatadpc.maps.arcgis.com/apps/opsdashboard/index.html#/b0c68bce2cce478eaac82fe38d4138b1
- https://www.epicentro.iss.it/en/coronavirus/sars-cov-2-dashboard

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WHO: Suspect Case Definition

Acute onset of fever and cough OR ≥ 3 of the following: fever, cough, general weakness/fatigue, headache, myalgia, sore throat, coryza, dyspnea, anorexia/nausea/vomiting, diarrhea, altered mental status

And 1 of the following within 14 days of symptom onset:

- Residing or working in an area with high risk of transmission*
- Residing or travel to an area with community transmission
- Working in a healthcare setting

OR:

Patient with severe acute respiratory illness (acute respiratory infection with history of fever or measured fever ≥ 38°C and a cough; onset within last 20 days; requires hospitalization)

*Closed residential settings, humanitarian settings such as camp and camp-like settings for displaced persons.

WHO COVID-19 Case Definition. Updated August 7, 2020. https://www.who.int/publications/i/item/WHO-2019-nCoV-Surveillance_Case_Definition-2020.1

Slide credit: clinicaloptions.com

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WHO: Probable Case Definition

Acute onset of fever and cough OR ≥ 3 of the following: fever, cough, general weakness/fatigue, headache, myalgia, sore throat, coryza, dyspnea, anorexia/nausea/vomiting, diarrhea, altered mental status

AND: Contact of probable or confirmed case or epidemiologically linked to a cluster with at least 1 confirmed case

OR:

Suspect case with chest imaging showing findings suggestive of COVID-19 disease*

OR:

Recent onset of loss of smell or taste in the absence of any other identified cause

OR:

Unexplained death in an adult with respiratory distress who was a contact of a probable or confirmed case or epidemiologically linked to a cluster with at least 1 confirmed case

*Hazy opacities with peripheral and lower lung distribution on chest radiography; multiple bilateral ground glass opacities with peripheral and lower lung distribution on chest CT; or thickened pleural lines, B lines, or consolidative patterns on lung ultrasound.

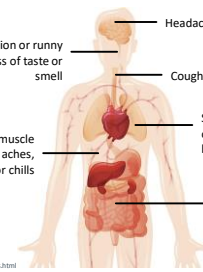
WHO COVID-19 Case Definition. Updated August 7, 2020. https://www.who.int/publications/i/item/WHO-2019-nCoV-Surveillance_Case_Definition-2020.1

Slide credit: clinicaloptions.com

107

Primary Symptoms of COVID-19

"Symptoms may appear **2-14 days after exposure** to the virus"

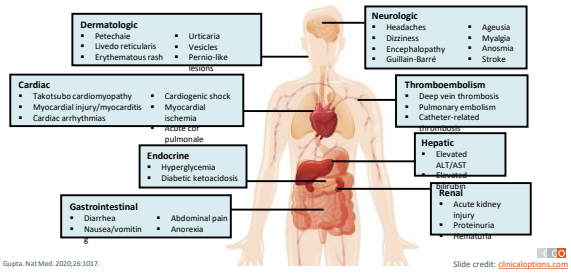


Li. J Med Virol. 2020;92:577.
https://www.cdc.gov/coronavirus/2019-ncov/symptoms-testing/symptoms.html

Slide credit: clinicaloptions.com

108

Extrapulmonary Manifestations of COVID-19: Which of These Return or Last?



Gupta. Nat Med. 2020;26:1017.

Slide credit: clinicaloptions.com

NIH Guidelines: Defining a COVID-19 Severity Spectrum

Stage	Characteristics
Asymptomatic or presymptomatic infection	▪ Positive test for SARS-CoV-2 but no symptoms
Mild illness	▪ Varied symptoms (eg, fever, cough, sore throat, malaise, headache, muscle pain) but no shortness of breath, dyspnea, abnormal imaging
Moderate illness	▪ SpO_2 ≥ 94% and lower respiratory disease evidenced by clinical assessment or imaging
Severe illness	▪ SpO_2 < 94%, PaO_2/FiO_2 < 300, respiratory rate > 30 breaths/min, or lung infiltrates > 50%
Critical illness	▪ Respiratory failure, septic shock, and/or multiorgan dysfunction

NIH COVID-19 Treatment Guidelines. Management of persons with COVID-19. Last updated October 9, 2020.

Slide credit: clinicaloptions.com

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COVID-19 Severity in Mainland China

- Observational study of COVID-19 cases diagnosed in China's Infectious Disease Information System as of February 11, 2020 (N = 72,314)
  - No deaths among confirmed case patients with noncritical disease or who were ≤ 9 yrs of age

Disease Classification, %	Confirmed Cases* (n = 44,672)
Mild	**80.9**
Severe	13.8
Critical	4.7
Missing	0.6

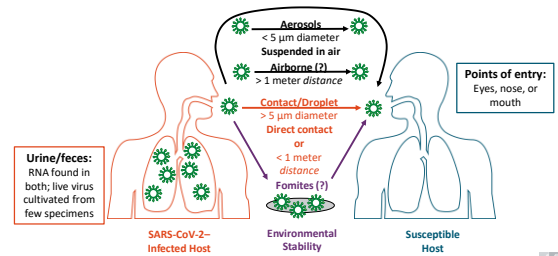
Characteristic	Case-Fatality Rate, % (n/N)
All confirmed cases*	2.3 (1023/44,672)
▪ **Critical**	**49.0 (1023/2087)**
▪ ≥ 80 yrs of age	14.8 (208/1408)
▪ Cardiovascular disease	10.5 (92/873)
▪ 70-79 yrs of age	8.0 (312/3918)
▪ Diabetes	7.3 (80/1102)
▪ Chronic respiratory disease	6.3 (32/511)
▪ Hypertension	6.0 (161/2683)
▪ Cancer	5.6 (6/107)

*Positive for viral nucleic acid by throat swab.

Wu. JAMA. 2020;323:1239. http://weekly.chinacdc.cn/en/article/id/e53946e2-c6c4-41e9-9a9b-fea8db1a8f51

Slide credit: clinicaloptions.com

Proposed Routes of SARS-CoV-2 Transmission



Galbadage. Front Public Health. 2020;8:163. WHO. Scientific Brief. July 9, 2020.

Slide credit: clinicaloptions.com

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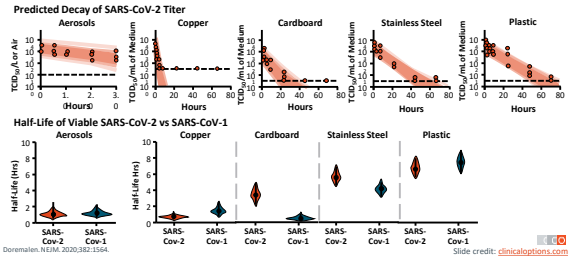
SARS-CoV-2: Aerosol and Surface Viability



Doremalen. N EJM. 2020;382:1564.

Slide credit: clinicaloptions.com

Rapid Inactivation of SARS-CoV-2 Aerosols in Sunlight

- In vitro simulations suggest a **90% loss of infectivity in 8-19 min** for SARS-CoV-2 aerosols exposed to mid to high intensity sunlight

Suspension Matrix at 20°C	Simulated Sunlight	Tests, n	Mean $k_{infectivity}$, min^{-1} (SD)	Mean Decay Rate, %/min (SD)
Simulated saliva	None	18	0.008 (0.011)	0.8 (1.1)
	Mid intensity	3	**0.121 (0.017)**	**11.4 (1.5)**
	High intensity	8	**0.306 (0.097)**	**26.1 (7.1)**
Culture medium	None	16	0.013 (0.012)	1.2 (1.2)
	Mid intensity	4	0.169 (0.062)	15.4 (5.3)
	High intensity	7	0.182 (0.041)	16.6 (3.3)

Results pooled across tests of varying relative humidity as this factor not found to significantly affect viral decay.

Schuit. J Infect Dis. 2020;222:564.

Slide credit: clinicaloptions.com

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Key Considerations on Modes of SARS-CoV-2 Transmission

- Person-to-person considered predominant mode of transmission, likely via respiratory droplets from **coughing, sneezing, or talking**[1,2]
  - High-level viral shedding evident in upper respiratory tract[3,4]
  - Airborne transmission suggested by multiple studies, but frequency unclear in absence of aerosol-generating procedures in healthcare settings[2]
- Virus **rarely cultured in respiratory samples > 9 days after symptom onset**, especially in patients with mild disease[5]
- Multiple studies describe a correlation between **reduced infectivity with decreases in viral loads** and rises in neutralizing antibodies[5]
- ACOG: "Data indicate that vertical transmission appears to be uncommon"[6]

1. https://www.cdc.gov/coronavirus/2019-ncov/prevent-getting-sick/how-covid-spreads.html
2. WHO. Scientific Brief. July 9, 2020. 3. Wölfel. Nature. 2020;581:465. 4. Zou. NEJM. 2020;382:1177.
5. WHO. Scientific Brief. June 17, 2020. 6. ACOG. COVID-19 FAQs for Obstetrician-Gynecologists, Obstetrics.

Slide credit: clinicaloptions.com

Timing of SARS-CoV-2 Transmission Based on Symptoms

- Prospective study of lab-confirmed COVID-19 cases (n = 100) and their close contacts (n = 2761) in Taiwan[1]
  - Paired index-secondary cases (n = 22) occurred more frequently with exposure **just before or within 5 days of symptom onset** vs later
- **Pre-symptomatic infections**
  - Accounted for 6.4% of locally acquired infections in a study in Singapore (N = 157)[2]
  - Modelling study of transmission in China (n = 154) estimated that 44% of transmissions may have occurred just before symptoms appeared[3]
- A recent systematic review and meta-analysis estimated that the proportion of total infections that are **truly asymptomatic range from 6% to 41% (pooled estimate of 15%)**[4]
  - Asymptomatic transmission rates ranged from 0% to 2.2% vs symptomatic transmission rates of 0.8% to 15.4%
  - 3 studies reported that the cycle threshold from RT-PCR assays did not differ between symptomatic and asymptomatic individuals

1. Cheng. JAMA Intern Med. 2020;180:1156. 2. Wei. MMWR. 2020;69:411. 3. He. Nature Medicine. 2020;26:672.
4. Byambasuren. MedRxiv. 2020;[Preprint]. Note: this study has not been peer reviewed.

Slide credit: clinicaloptions.com

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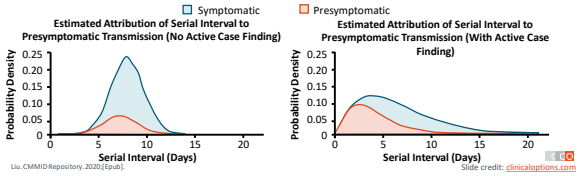
Presymptomatic Transmission

- Transmission events in Shenzen, China were inferred to be asymptomatic or presymptomatic using the probability for symptom onset on a given day following exposure
- Estimated that 23% of transmissions prior to symptom onset before active case finding was implemented, increased to 46% with accelerated case isolation

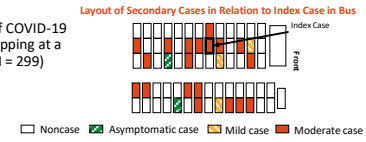


Liu. CMMID Repository. 2020;[Epub].

Slide credit: clinicaloptions.com

SARS-CoV-2 Transmission in Indoor Settings (Limited Air Circulation)

- An outbreak investigation of COVID-19 among lay Buddhists worshipping at a temple in Zhejiang, China (N = 299)
  - Travel: ~ 50 mins each way
  - Worship event: ~ 150 mins (mostly outdoors)



Area of Exposure	Cases	Total	Attack Rate (95% CI)	Relative Risk (95% CI)	*P* Value
Bus 1	0	60	0 (0-6.0)	Ref	--
Temple (excluding those arriving on bus 2)	7	232	3.0 (1.3-6.2)	Ref	--
Bus 2 (index case)	23	67	34.3 (24.1-46.3)	--	
▪ Relative risk vs bus 1	--	--	--	41.5 (2.6-669.5)	< .01
▪ Relative risk vs temple (excluding bus 2)	--	--	--	11.4 (5.1-25.4)	< .01

Chen. medRxiv;[Preprint]. Note: this study has not been peer reviewed.

Slide credit: clinicaloptions.com

SARS-CoV-2 Transmission in Enclosed vs Outdoor Settings

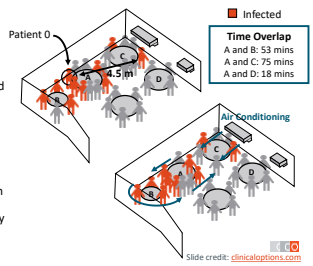
- Study in Japan traced contacts of 110 people with COVID-19 in ten indoor clusters and assessed the environment in which transmission between contacts occurred[1]
  - 27 primary cases generated secondary cases (24.6%)
- Odds that a primary case transmitted SARS-CoV-2 in an enclosed environment **18.7 x higher** compared with odds of estimated transmission rates in an open-air environment (95% CI: 6.0-57.9)[1]
- **6 of 7 superspreading events** (to 3 or more people) occurred in enclosed environments (OR vs open-air environments: 32.6; 95% CI: 3.7-289.5)[1]
- Consistent with cluster in Germany from indoor work meeting, cluster from a ski chalet France, cluster from choir practice in the US, and church- and hospital-associated clusters in South Korea[2-5]

1. Nishiura. medRxiv;[Preprint]. Note: this study has not been peer reviewed. 2. Hijnen. Emerging Infectious Diseases. 2020;[Epub]. 3. Danis. Clin Infect Dis. 2020;71:825. 4. Hamner. MMWR. 2020;69:606. 5. Shim. Int J Infect Dis. 2020;93:339.

Slide credit: clinicaloptions.com

SARS-CoV-2 Transmission: Recirculated Air and Poor Ventilation

- 3 families (A, B, and C) ate lunch at a restaurant on January 24, 2020 at 3 neighboring tables
  - 10 of those sitting at these tables (including the index case) were later found to have been infected with sARS-CoV-2 at the restaurant
  - None of the waiters or 68 patrons at the remaining 15 tables became infected
  - Authors note that these results do not show that long-range aerosol transmission can occur in *any* indoor space, but that transmission may occur in crowded/poorly ventilated spaces



Li. medRxiv;[Preprint]. Note: this study has not been peer reviewed.

Slide credit: clinicaloptions.com

Summary of SARS-CoV-2 Transmission in Various Settings

- Crowded enclosed spaces facilitate SARS-CoV-2 transmission
- Transmission rates in enclosed spaces appear to be correlated with duration of exposure
  - Longer duration → greater risk of transmission
- Airborne transmission hypothesized
  - Biologically plausible → aerosol generated with greater than normal force or if air current moves aerosol > 1 meter and droplets remain intact
- Continued observational study and sentinel animal study required to better understand airborne transmission potential

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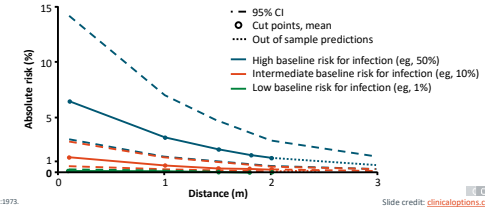
Physical Distance and Transmission

- Systematic review and meta-analysis of data from 172 studies investigating the spread of SARS-CoV-2, SARS, and MERS (n = 10,736)



Chu. Lancet. 2020;395:1973.

122

Efficacy of Face Coverings in Prevention of SARS-CoV-2 Transmission

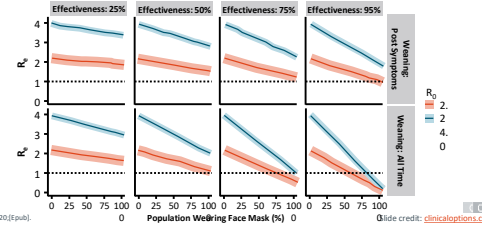
- Systematic review and meta-analysis of data from 172 studies investigating the spread of SARS-CoV-2, SARS, and MERS (n = 2647)[1]
  - Face mask use (surgical, N95, or cotton mask) resulted **in large reduction in infection (OR: 0.15; 95% CI: 0.07-0.34)**
  - Association was stronger for N95 or respirators vs disposable or 12-16 layer cotton masks ($P_{interaction}$ = 0.090)
- Study of human coronaviruses in exhaled breath of children and adults with acute respiratory illnesses wearing surgical face masks vs no mask (N = 246)[2]
  - Virus detected in **respiratory droplets** in 3 of 10 samples collected without face masks vs **0 of 11 samples with a mask (*P* = .07)**
  - Virus detected in **aerosols** in 4 of 10 samples collected without face masks vs **0 of 11 samples with a mask (*P* = .02)**

1. Chu. Lancet. 2020;395:1973. 2. Leung. Nature Medicine. 2020;26:676.

123

Predicted Efficacy of Face Masks on SARS-CoV-2 Transmission Dynamics

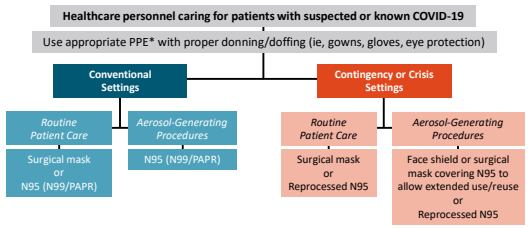
- Simulations with branching process model to investigate the reduction in transmission by wearing face masks on the R_e (expected number of new cases caused by a single infectious person at any given point)



Stutt. Royal Society. 2020;[Epub].

124

IDSA: SARS-CoV-2 Infection Prevention



*IDSA makes no recommendation regarding double vs single glove or shoe cover vs no shoe cover use.

IDSA. COVID-19 Guideline, Part 2: Infection Prevention. Version 1.0.1.

Slide credit: clinicaloptions.com

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Nonpharmacologic Preventative Interventions

Recommended Prevention Strategies[1,2]
Identify and quickly test suspect cases with subsequent isolation of infected individuals
Quarantine close contacts of infected individuals
Wash hands often with soap and water
Maintain social distance (~ 6 feet)
Wear cloth face cover in public[3,4]
Practice respiratory etiquette
Disinfect frequent-touch surfaces regularly
Avoid crowds, close-contact settings, and poorly ventilated spaces

- Inactivation of SARS-CoV, MERS-CoV, and other endemic human coronaviruses readily accomplished with 62% to 71% ethanol, 0.5% hydrogen peroxide, or 0.1% sodium hypochlorite (in 1 min)[5]
  - 0.05% to 0.2% benzalkonium chloride, 0.02% chlorhexidine digluconate less effective

1. https://www.cdc.gov/coronavirus/2019-ncov/prevent-getting-sick/prevention.html 2. WHO. Scientific Brief. July 9, 2020.
3. Leung. Nat Med. 2020;26:676. 4. Chu. Lancet. 2020;395:1973. 5. Kampf. J Hosp Infect. 2020;104:246.

Slide credit: clinicaloptions.com

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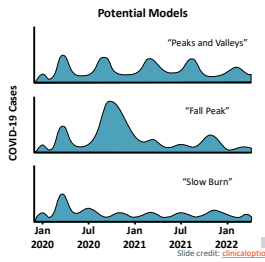
Projecting Postpandemic SARS-CoV-2 Transmission

- Recurrent outbreaks likely after initial, most severe pandemic period
  - Interval and height of coming waves will depend on multiple factors, including control measures
  - Prepare for ≥ 18-24 mos of significant COVID-19 activity with periodic hot spots across diverse geographies



Kissler. Science. 2020;368:860. COVID-19: The CIDRAP Viewpoint. April 30, 2020.

Slide credit: clinicaloptions.com

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COVID-19 Elimination in New Zealand

"Rapid, science-based risk assessment linked to early, decisive government action was critical."

Feb 26, 2020	Mid March 2020	Mar 26, 2020	Early May 2020	June 8, 2020	Post Elimination
First COVID-19 case diagnosed in New Zealand	Recognized insufficiency of current testing and contact tracing capacity; considered switch from mitigation to elimination approach	Implemented stringent countrywide lockdown (ie, 7 wks of national stay-at-home order)	Last known COVID-19 case isolated, marking end of community spread	Pandemic over, 103 days after first case	Only known cases among international travelers, kept in quarantine 14 days
		Alert Level 4		Alert Level 1	

Cases: 1569, **Deaths**: 22
Mortality: 4 per 1 million

Baker. NEJM. 2020;383:e56.

Slide credit: clinicaloptions.com

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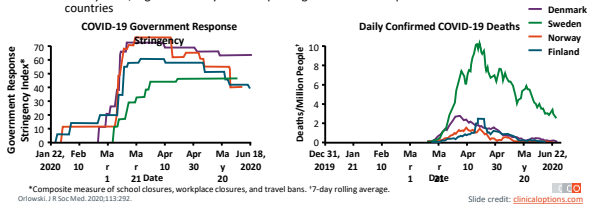
Less Stringent Mitigation Measures: Sweden Compared to Other Scandinavian Countries

- Sweden permitted limited infection to continue by controlled viral spread to potentially reach herd immunity
  - To July 2020, higher mortality rate and prolonged outbreak compared to other Scandinavian countries



*Composite measure of school closures, workplace closures, and travel bans. †7-day rolling average.

Orlowski. J R Soc Med. 2020;113:292.

Slide credit: clinicaloptions.com

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NTDs

Neglected tropical diseases

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Neglected Tropical Diseases

- A diverse group of communicable diseases that prevail in tropical and subtropical conditions
- Affect more than one billion people in 149 countries, half of them are children
- May be transmitted by vectors (flies, mosquitoes, etc), or through contact with contaminated soil or water
- Mainly affect populations living in poverty, without adequate sanitation and in close contact with infectious vectors and domestic animals and livestock
- NTDs cost developing economies billions of dollars every year

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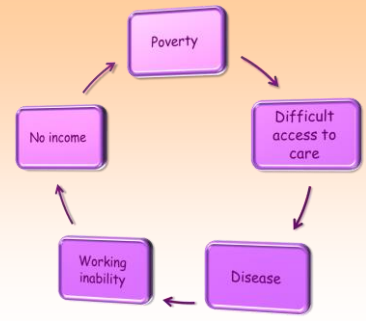
Vicious cycle



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Neglected = forgotten, ignored, deserted, mistreated

- Concern neglected countries
- Affect neglected populations without any political power
- Produce inability, stigma and social discrimination
- Neglected by the public opinion because unknown
- Often neglected even by sanitary politics of affected countries

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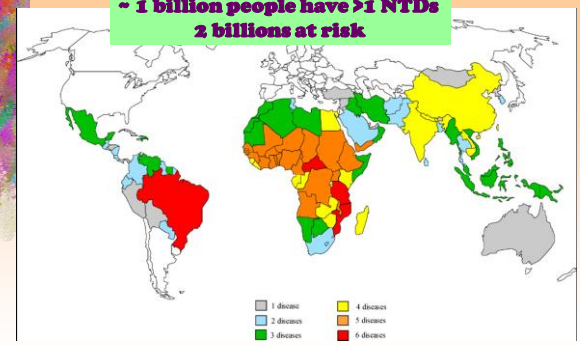
Global distribution of NTDs

~ 1 billion people have >1 NTDs
2 billions at risk



Special Programme for Research & Training in Tropical Diseases (TDR) sponsored by UNICEF/UNDP/World Bank/WHO — World Health Organization

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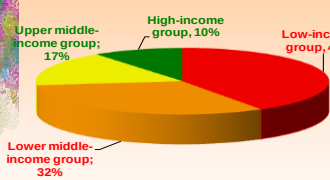
Countries affected by NTDs by income group



More than 70% of countries and territories affected by NTDs are low-income and low middle-income countries

100% of low-income countries are affected by at least 5 NTDs

Special Programme for Research & Training in Tropical Diseases (TDR) sponsored by UNICEF/UNDP/World Bank/WHO — World Health Organization

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19 diseases

1. Buruli Ulcera
2. Chagas disease
3. Dengue and Chikungunya
4. Dracunculiasis (guinea-worm disease)
5. Echinococcosis
6. Foodborne trematodiases
7. Human African trypanosomiasis (sleeping sickness)
8. Leishmaniasis
9. Leprosy (Hansen's disease)
10. Lymphatic filariasis
11. Mycetoma
12. Onchocerchiasis (river blindness)
13. Rabies
14. Schistosomiasis
15. Soil transmitted helminthiasis (STH)
16. Taeniasis/cysticercosis
17. Trachoma
18. Yaws (endemic treponematoses)
19. Madura foot

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Despite the heavy burden that NTDs pose over the poorest populations of the world they could be prevented, controlled and even eradicated by improving simple, safe and economic measures

HOW TO FIGHT NTDs

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Different diseases, different strategies

Helmintic diseases	Protozoal diseases
❑ Wide distribution	❑ Less distributed
❑ Often associated	❑ Rarely associated
❑ Chronic evolution	❑ Less chronic evolution
❑ Rarely deadly	❑ Often deadly

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Two types of interventions

Large scale interventions

- Lymphatic filariasis
- Leprosy
- Onchocerciasis
- Schistosomiasis
- Helminthiasis
- Trachoma
- Yaws

➡ Rapid impact interventions
Improving access

Preventive Chemotherapy

Case management and development of new tools

- Human African trypanosomiasis
- Chagas diseases
- Buruli ulcer
- Leishmaniasis
- Dengue

➡ Focused interventions
Improving innovation

Innovative & Intensified Disease Management

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Preventive Chemotherapy	Innovative & Intensified Disease Management
Control tools available Safe, easy to administer, economical (or donated) drugs Easy and economical diagnosis	**Control tools insufficient** Expensive, unsafe, difficult to administer drugs Individual diagnosis needed
⬇	⬇
Community approach	Individual approach
❑ Preventive treatment of whole communities, made by sanitary or social structures (eg school) at regular intervals	❑ Individual treatment, made by skilled personnel, with specialized tools
❑ Priority: treat as many people as possible	❑ Priority: find new tools

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Preventive Chemotherapy

- Drugs (n=5):
  - » albendazole/mebendazole: STH
  - » DEC or ivermectin + albendazole: lymphatic filariasis
  - » ivermectin: onchocerchiasis
  - » praziquantel: schistosomiasis
  - » (azitromicin: trachoma and yaws)
- Different drug combinations for different disease combinations
  - » Reduce intensity of infection in order to:
    - control morbidity (schisto, STH)
    - eliminate morbidity (onchocerchiasis)
    - eliminate transmission (LF)
- Hundreds of millions of people "protected" every year
- Expense pro person: <1 US$/yr

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A few examples

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Lymphatic filariasis management

- Vector control
- Hygienic measures
- Skin care
- Physical excercise
- Raising of affected limbs
- Treatment of lymphangitic events
- Surgery if needed

- **Preventive chemotherapy**
- Out of 73 endemic countries where preventive chemotherapy has been implemented, in 18 it has been now stopped and surveillance started, in order to confirm eradication of the disease

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Onchocerchiasis

At the end of the track

Commemorative statue in front of the main entrance of WHO

- Vector control + ivermectin distribution (once a year for 10-15 yrs)
  - » 40 million people cured
  - » blindness prevented in 600.000 people
  - » 18 million children not at risk
  - » 25 million hectares land become farming again, able to feed 17 million people every year

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Schistosomiasis

- Chronic disease acquired trough contact with contaminated water, often during working activity or during game for children
- Control strategies
  - » fighting vectors (snails)
  - » availability of clean water
  - » improvement of sewage systems
  - » better hygiene

» **Preventive chemotherapy**

- Praziquantel, once a year for several years

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Leprosy

- Little contagious but transmissible on close contact
- If untreaated can cause progressive and permanent damage to the skin, nerves, limbs and eyes
- Leprosy is **curable** with multidrug therapy (MDT, association of dapsone, rifampicin, clofazimin), freely distributed worldwide by WHO since 1995
- What still must be fought is the **stigma** bound to such disease: patients may hide their symptoms and do not seek medical advice, fearing to be isolated

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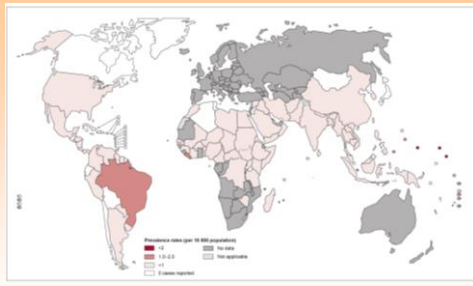
Leprosy



5.2 millions in 1985; 805.000 in 1995;
180.618 at the end of 2013

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Migration

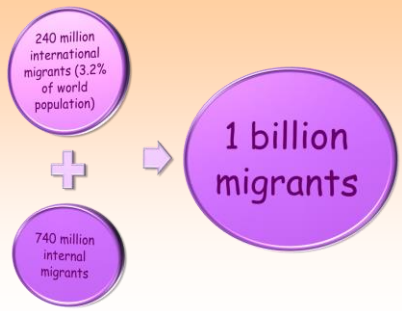
The action with which a person or a group of people leaves a geographical area with the aim of settling definitevely or temporarely in another

151

Different groups of migrants and types of migration

152

Numbers



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One out of seven

154

Refugees

- whoever "owing to wellfounded fear of being persecuted for reasons of race, religion, nationality, membership of a particular social group or political opinion, is outside the country of his nationality and is unable or, owing to such fear, is unwilling to avail himself of the protection of that country; or who, not having a nationality and being outside the country of his former habitual residence as a result of srious events, is unable or, owing to such fear, is unwilling to return to it"

OVER 20 MILLION IN 2014

Geneva Refugee Convention (art.1) - 1951

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Asylum seekers per million population (OCSE Jan-Jul 2015)

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Irregular flows

30/40 million irregular migrants in the world

USA: around 8.5 million
(500.000 entrances/yr)

Europe (UE/27): around 4 million
(400.000 entrances/yr)

Italy: 500-750.000

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Italy - reversing the trend

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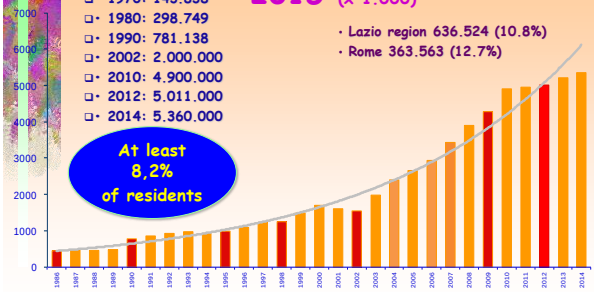
Immigrants in Italy: total number and trend – beginning 2015 (x 1.000)

- 1970: 143.838
- 1980: 298.749
- 1990: 781.138
- 2002: 2.000.000
- 2010: 4.900.000
- 2012: 5.011.000
- 2014: 5.360.000

- Lazio region 636.524 (10.8%)
- Rome 363.563 (12.7%)

At least 8,2% of residents



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Mediterranean disembarkments 2018

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Countries of origin

From 198 countries

First 10 nationalities

Cittadinanza	Residenti	% Donne
1. Romania	1.131.839	57,0
2. Albania	490.483	48,1
3. Marocco	449.058	45,9
4. Cina	265.820	49,0
5. Ucraina	226.060	79,0
6. Filippine	168.238	56,4
7. India	147.815	39,9
8. Moldova	147.388	66,1
9. Bangladesh	115.301	29,6
10. Perù	109.668	58,4
Totale	**5.014.437**	**52,7**

FONTE: ISTAT

✓ Resident minors: **1.085.274**

(21,6% of total residents)

✓ Newborns during the year: **75.067**

(14,9% of total newborns)

Dossier Statistico Immigrazione 2015 UNAR/IDOS

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Healthcare of foreign patients

Interaction problems
Regulatory problems
Clinical problems

162

A common language?

- Knowledge of italian
- Knowledge of other common languages
- Common terms
- Cultural expressions
  - » idea of sickness;
  - » idea of treatment;
  - » idea of own body, symptoms, health
  - » sanitary education;
  - » prevention;
  - » trusting our medicine – or not
- Knowledge of services

163

A few examples

- All my body pains m
- More exams? No, bottles
- Diabetes? well, I fe
- I don't w hospital
- I don't w working
- Somethin
- How old
  - » 37, as
  - » What
  - » Ah, 52

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Healthcare of foreign patients

Interaction problems
Regulatory problems
Clinical problems

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Art. 32 della Costituzione Italiana

- La Repubblica tutela la salute come fondamentale diritto dell'individuo ed interesse della collettività e garantisce cure gratuite agli indigenti

166

Legge Quadro sull'immigrazione n. 40/98 (e succ. DL 286/98)

- In particolare sono garantiti:
  - » tutela della gravidanza e della maternità
  - » tutela della salute del minore
  - » vaccinazione e interventi di profilassi internazionale
  - » profilassi, diagnosi e cura delle malattie infettive
- L'accesso al Servizio Sanitario da parte di uno straniero non in regola con il permesso di soggiorno non comporta la segnalazione alla questura

167

Accordo Stato-Regioni Dicembre 2012

"Indicazioni per la corretta applicazione della normativa per l'assistenza sanitaria alla popolazione straniera da parte delle Regioni e Province Autonome italiane"

- iscrizione obbligatoria al SSN di:
  - » minori stranieri anche in assenza del permesso di soggiorno;
  - » regolarizzandi
  - » anche in fase di rilascio (attesa) del primo pds per uno dei motivi che danno diritto all'iscrizione obbligatoria al SSN
  - » genitore comunitario di minori italiani
- iscrizione volontaria:
  - » per gli over 65enni con tariffe attuali
  - » per i comunitari residenti
  - » per studenti comunitari con il solo domicilio

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Healthcare of foreign patients

Interaction problems
Regulatory problems
Clinical problems

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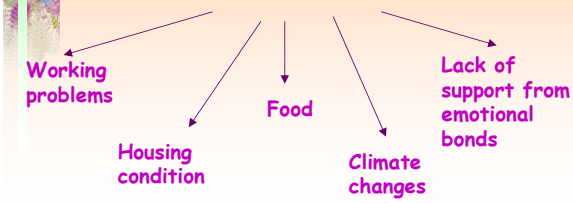
Healthy migrant effect

- Selfselection on departure of younger and healthier people who decide to migrate and reach the arrival country in a healthy state
- Only later on environmental factors will contribute to the onset of diseases



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Environmental factors

- Working problems
  - » Immigrants often have risky jobs, with low salary and no insurance
- Housing condition
  - » dormitories, immigration centers, huts, temporary shelters (train wagons, bridges or arcades, waiting rooms of metro or rail stations, etc.), overcrowded rooms
  - » Inadequate personal hygiene with clear risks of infectious disease diffusion

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Environmental factors

- Food
  - » Difficulty in adapting to a different food culture
  - » Religious or philosophical hindrance
  - » Economical constraints in buying food
- Climate changes
  - » Different humidity levels
  - » New allergens
- Lack of support from emotional bonds
  - » Parting from own family and social group (friends, partner, relatives)

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Infectious diseases

- Syndromic surveillance by ISS May 2011 - June 2013
- 139 asylum seeker centers in 13 Italian regions (median n. of daily hosts: 5.300)
- No sanitary emergence
- Only 20 confirmed statistical alerts
  - » 8 infestations
  - » 5 febrile respiratory syndromes
  - » 6 gastroenteritis
  - » 1 suspected pulmonary tb

Rapporto Osservasalute 2014

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Umberto I Hospital answer
Birth of the service

- December 2002
  - » Pilot unit near the Emergency Dpt, with volunteer medical doctors and nurses
- May 2003
  - » An Infectious Disease office is added, 3 days a week
- December 2005
  - » The unit is transferred to Infectious Disease Dpt
- December 2008
  - » Recognized as Day Service of Migration Medicine

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The service today

- Direct access, no appointment needed
- Devoted to irregular foreigners
- Opening:
  - » Mon through Fri: 10:00 to 4:00 pm
- Over 10.000 patients visited
- Around 400 visits monthly

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1-year observation

Total population (939 pts)

188 AS
accomodated in smaller second-line reception centers, some only for minors, often accompanied by italian operators or even cultural mediators

751 long standing undocumented migrants
using the facility as a family doctor for general medicine needs

177

ASYLUM SEEKERS (AS)

95.7% males
Mean age: 21.3 years (M 21.3 – F 21.9)
37.8% unaccompanied minors

178

Screening - TB

188 screened

145 (77.1%) TST negative

43 TST positive (22.9%), all were prescribed lung X-ray

27 never returned (presumed negative?)

16 (37.2%) came back showing negative X-ray

LTBI treatment offered to all, but accepted and completed only by 6 (37.5%), all living in the same 2 centres

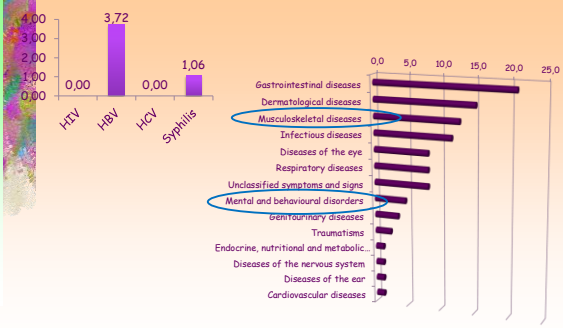
1st visit
Physical exhamination
TST

2nd visit
TST reading
Blood tests + urine and stool samples

3rd visit
View of results

179

Screening and pathologies in AS



180

Unaccompanied minors

- 72 unaccompanied minors
- age ranging from 13 to 17 years
- only one girl, 15 yrs old, Egyptian
- mean education 8.4 yrs
- TST+ 4/72 (5.6%)
- only 1 HBsAg+ (1.4%)
- 21 out of 72 (29.2%) presented with additional diagnoses, but none relevant
- mostly arriving from Egypt (72.2%)
  - » none with positive screening
  - » 13/53 (24.5%) had other diagnoses

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UNDOCUMENTED LONG STAYING MIGRANTS

60% males

Mean age: 38.6 years (F 40.5 – M 37.4)

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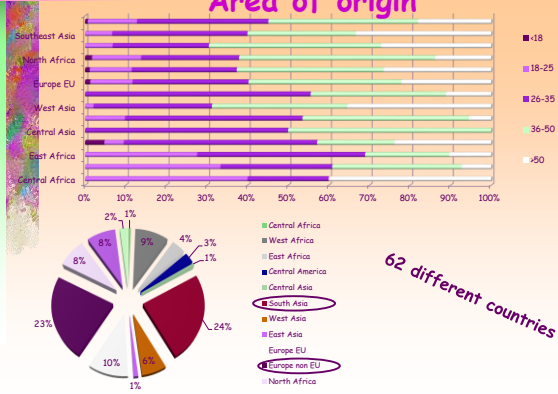
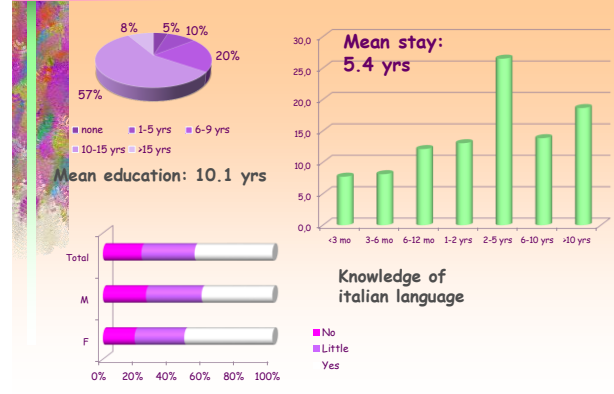
Area of origin



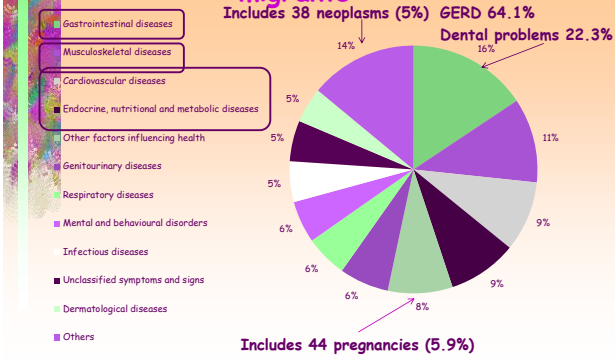
62 different countries

183



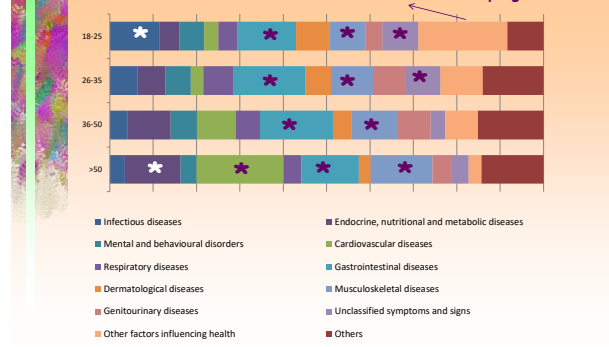
184

Observed diagnoses in long standing migrants



185

Diagnoses and age groups



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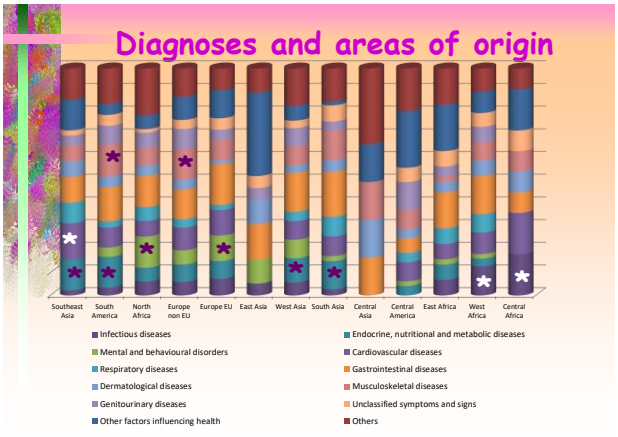
Diagnoses and areas of origin



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Food for thought

- Heterogeneous population
  - 62 different countries of origin
  - 18% are >50 years of age (24.6% among women)
- On the edge of our society
  - Only a minority is able to speak Italian with confidence
  - Unsafe living and working conditions
  - Difficult access to care
- Diseases and conditions related to stressing life situations
  - GERD
  - Mental and behavioural disorders (including drug and alcohol addiction)
  - Unclassified symptoms and signs
- Chronic diseases
  - Cardiovascular
  - Metabolic and nutrition
  - Neoplasms
  - Chronic respiratory
  - Rheumatological

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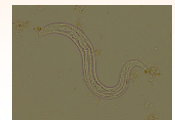
Our stories

189

SK, 👦, Mali, 24 aa

- Disembarked at Lampedusa 7 months earlier, he speaks English
- He often complains about retrosternal and abd… pain; eventually fever and cough start, and the boy … home under amoxicillin/clavulanic acid
- After 1 month again in ER. Lun… of left mid-basal aerea …
- Sent home with … levofloxacin 750 mg/die
- Sen…
- … epigastrical pain, but mostly about p… condrium and flank, stronger at night and a… by persisting dry cough
- Us… screening analysis are prescribed, including stool exhamination for parasites

different pathologies



Strongyloides stercoralis larvae (2400/g)
Therapy with albendazole was started
After few days symptoms decrease and then disappear

190

FM, 👩, Bosnia, 48 yrs

- Unemployed, lives alone with 2 sons (one is 16 with minor learning disabilities, the older unemployed)
- She has a difficult past: ill-treated by … nts, the ex-husband and other partners, 3 previous chil… Social Services
- At first visit she state… diabetes, ischemic cardiopathy, but do…
- On first tes… mer diabetes nor thyroiditis
- It will ta… out cardiopathy, after ecoCG, coronarograp… diac CT will all result normal
- Since years … only takes psychiatric drugs and PPI, but at every visit complains of new symptoms, sure of being finally seriously ill
  - In one year she came 23 times
  - And mainly she often calls 118 and is brought to ER where, again, lists all her diseases (!): DM, thyroid, heart. And each time she undergoes different exams, all regularly negative

Social factors

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SN, 👦, Bangladesh, 57 (43 on passport)

- Obese – H 165, Kg 83, BMI …
- Comes for knee pain due to severe gonarthrosis
- Later: appearance of … nsion, dislipidemia, glicemic … tion
- He is now Kg 89
- We … do you eat for bre…
- We … en diet
- He … to be following it. But is now Kg 93
- Let's start again. What do you eat for breakfast? Cappuccino e cornetto? Noo …

Language barrier

192

KS, ♀, India, 40 yrs

- In Italy since 6 months (no italian), w… her husband (who speaks good italian), regular in Italy
- After 1 month she is pregnant but looses h… baby before third month
- Pregnant again (10 wks), we pres… visit
- Hb 8.8, ERS 102, albumi…
- We evaluate her… due to her religion (sikh…
- Diet… supplementation: Hb 12.7
- 26 w… est, sent to ER. Later we are told that … to communicate with her (the husband was th… but she is ok and will be sent home
- At shift change she is admitted for gestational diabetes, hypertension and polidramnios
- 35 wks: admitted again for pre-eclampsia, cesarian section, the baby is healthy

different culture

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AM, ♂, Bangladesh 50 yrs
(39 on passaport)

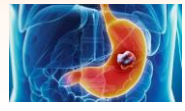
- First visit: doesn't even want to seat; just complains of toothache asking for red paper to see a dentist
- Agrees to let us fill the record
- Any disease? Yes, diabetes…
- Do you take any m… them from Bangladesh. I… name
- Done… never since I'm in Italy (5…
- …ems? None. BP 160/90
- …come and get visited. And …
- Six months earlier had been admitted for anterior AMI treated with myocardial revascularization and 3 bypasses. When he finished the first box, he stopped therapy. He was feeling well

different concept of disease

194

HE, ♂, Bosnia, 65 yrs

- In Italy since more than 20 years, speaks good italian, knows the sanitary system
- Past hystory: biological mitralic valve, rectal cancer, pulmonary TB, random alcohol abuse; always following due contr…
- Comes complaining of dark stools and epi… we prescribe EGDS but 2 more tarry stool epis…
- At ER: tarry stool at re… sured, he is sent back home, advising …
- EGDS: no bl… performed
- One month… esis. He returns to ER and again is reassured, … uses admission
- But we do n… feel reassured, make him undergo RSCS (neg) and a new EGDS: this time an ulcer of the fundus is seen and biopsy shows gastric adenocarcinoma
- Rapidly admitted to surgery Dept, he undergoes total gastrectomy; hystological exam shows a 3.5x2 cm lesion, deepening until subserosa layer, without lymphnode metastases



Whose fault here?

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Link per i video

- Filariasi linfatica
  - » http://www.end.org/?vid=elephantiasis
- Oncocerchiasi
  - » http://www.end.org/whatwedo/ntdoverview/river-blindness
- Schistosomiasi
  - » http://www.end.org/whatwedo/ntdoverview/schistosomiasis

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