Public Health:

what is it?

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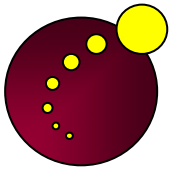


Center for Emerging Infectious Diseases

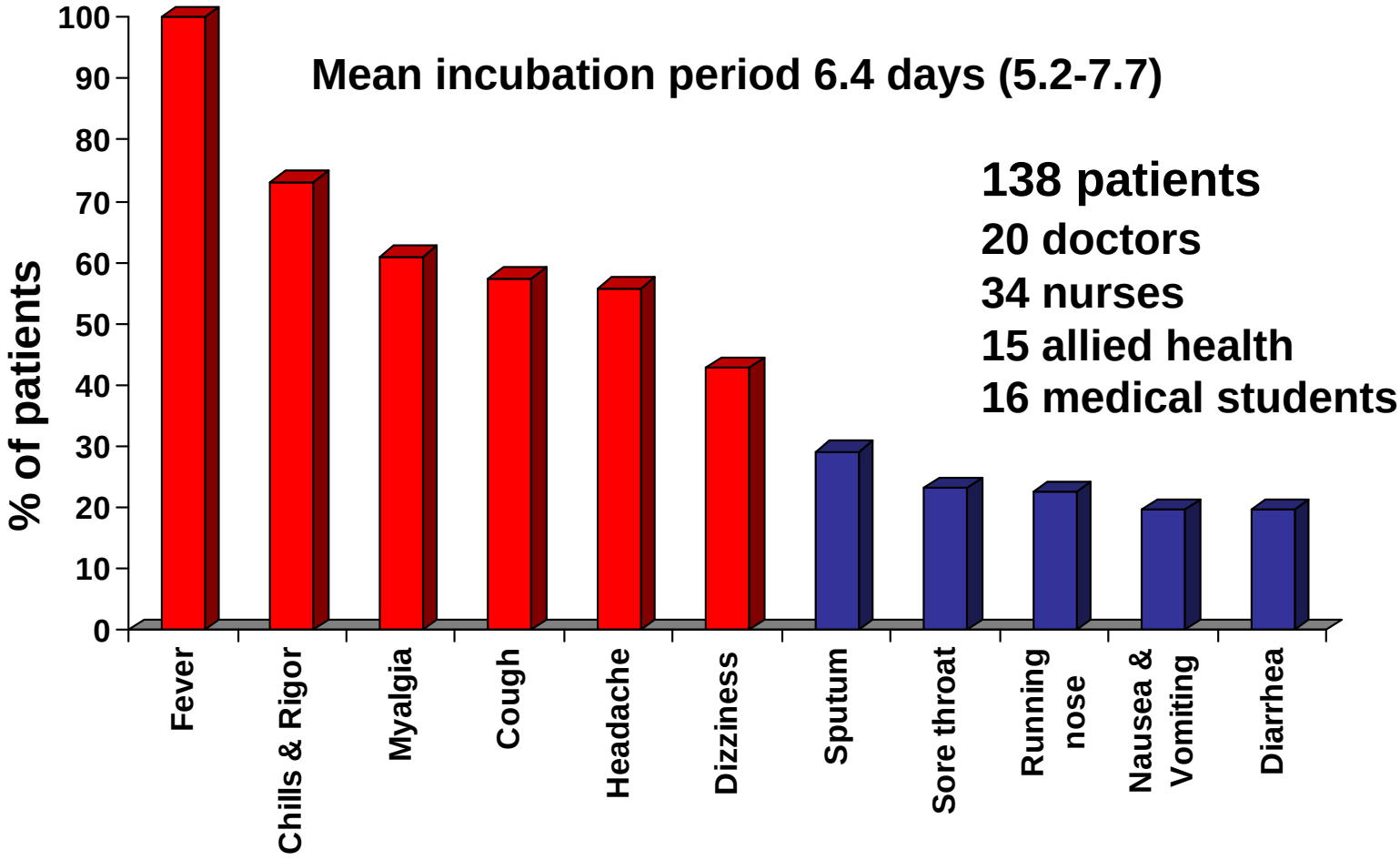
The NEW ENGLAND JOURNAL of MEDICINE

ORIGINAL ARTICLE

A Major Outbreak of Severe Acute Respiratory Syndrome in Hong Kong

Nelson Lee, M.D., David Hui, M.D., Alan Wu, M.D., Paul Chan, M.D., Peter Cameron, M.D., Gavin M. Joynt, M.D., Anil Ahuja, M.D., Man Yee Yung, B.Sc., C.B. Leung, M.D., K.F. To, M.D., S.F. Lui, M.D., C.C. Szeto, M.D., Sydney Chung, M.D., and Joseph J.Y. Sung, M.D.

Common Symptoms of SARS

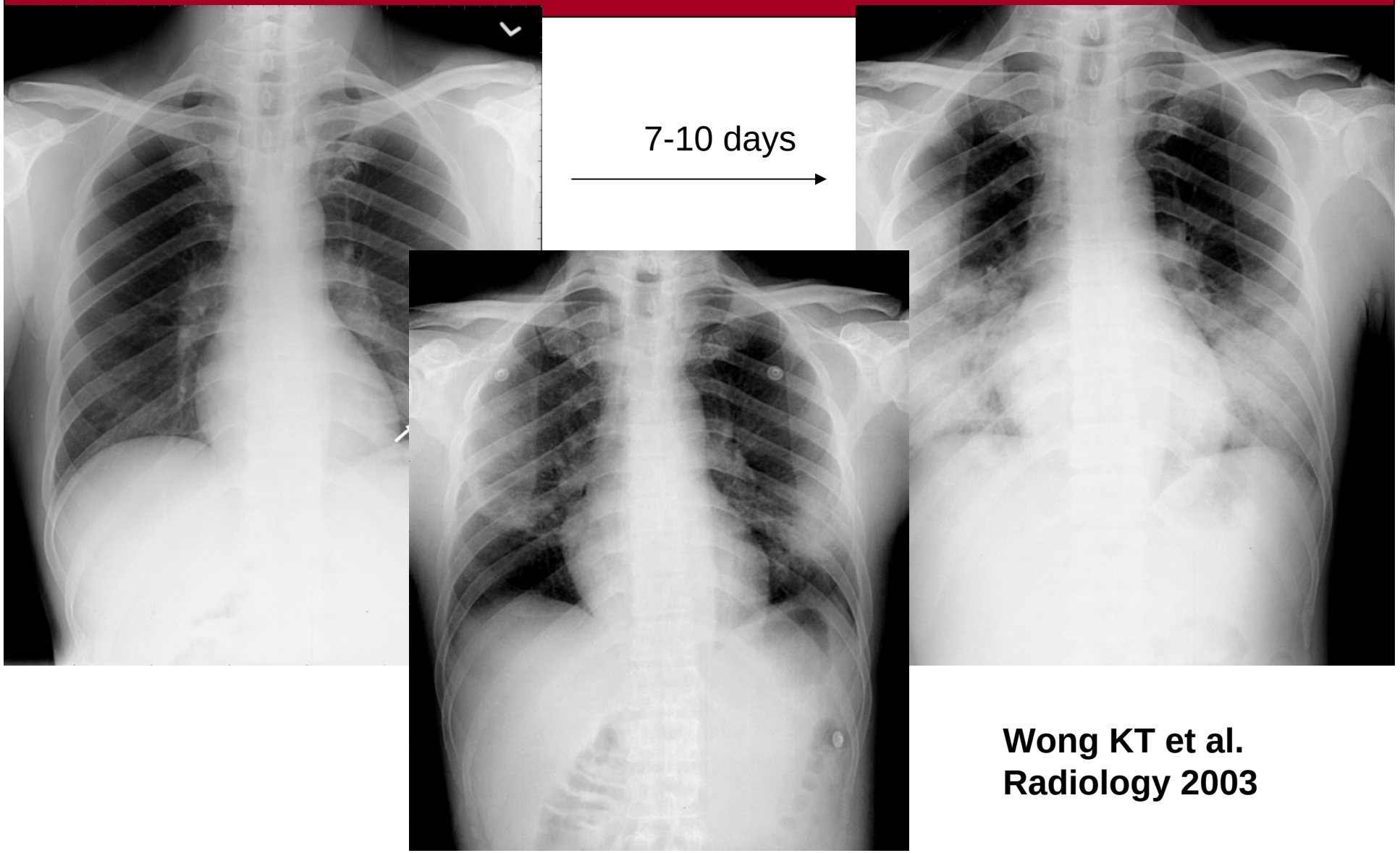


Lee NS et al. NEJM 2003

Presenting Symptoms of SARS

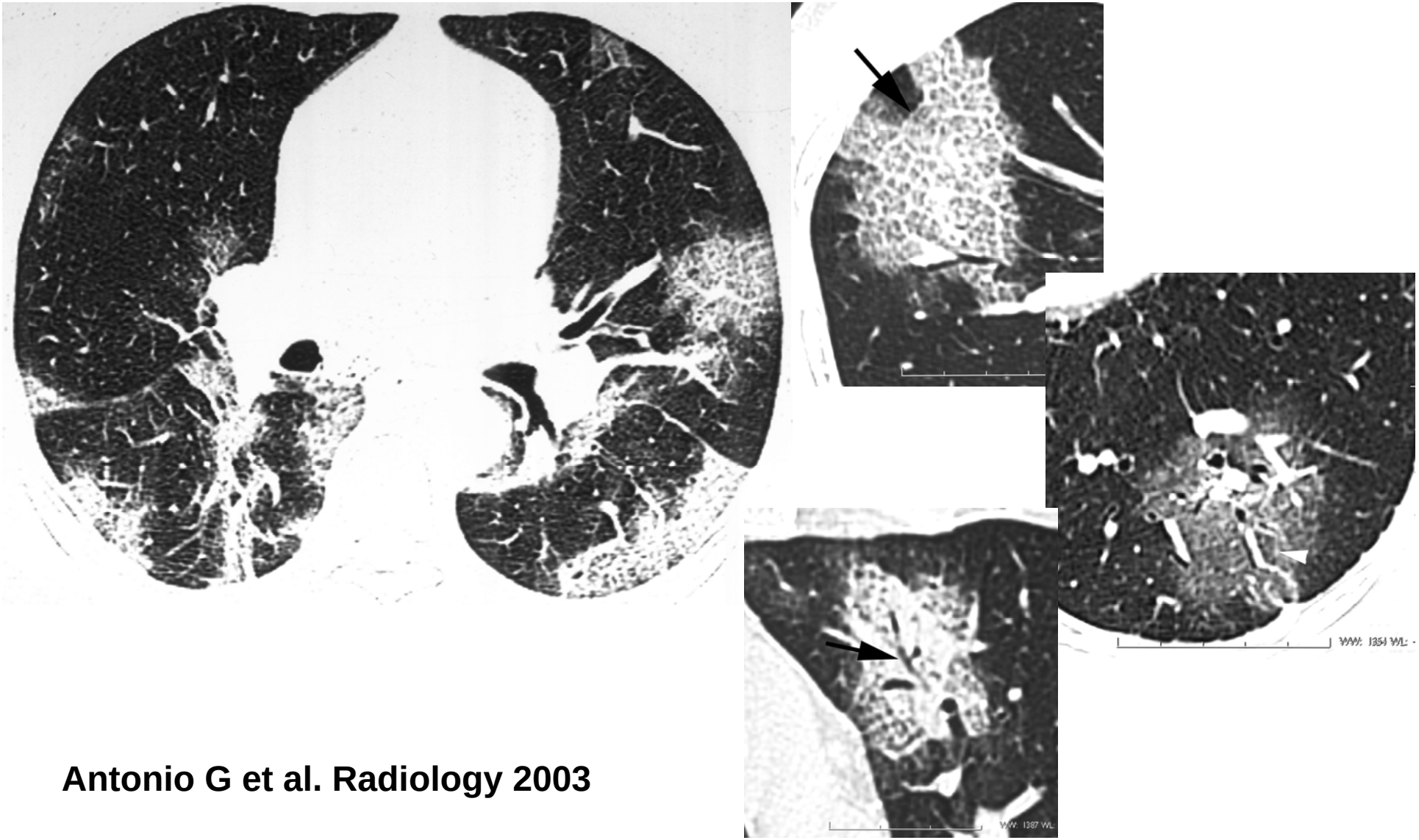
Clinical features (%)	Hong Kong Lee et al (n=138)	Toronto Booth et al (n=144)	Hong Kong Peiris et al (n=50)	Guangzhou Wu et al (n=96)	Singapore Hsu et al (n=20)
Fever	100	99.3	100	100	100
Chills/rigor	73.2	27.8	74	55.2	15
Myalgia	60.9	49.3	54	21.9	45
Cough	57.3	69.4	62	85.4	75
Dyspnoea	--	41.7	20	--	40
Headache	55.8	35.4	20	39.6	20
Dizziness	42.8	4.2	12	--	--
Sputum	29.0	4.9	--	66.7	--
Diarrhea	19.6	23.6	10	--	25
Nausea & vomiting	19.6	19.4	20	--	35
Sore throat	23.2	12.5	20	--	25
Malaise	--	31.2	50	35.4	45

Chest Radiographs

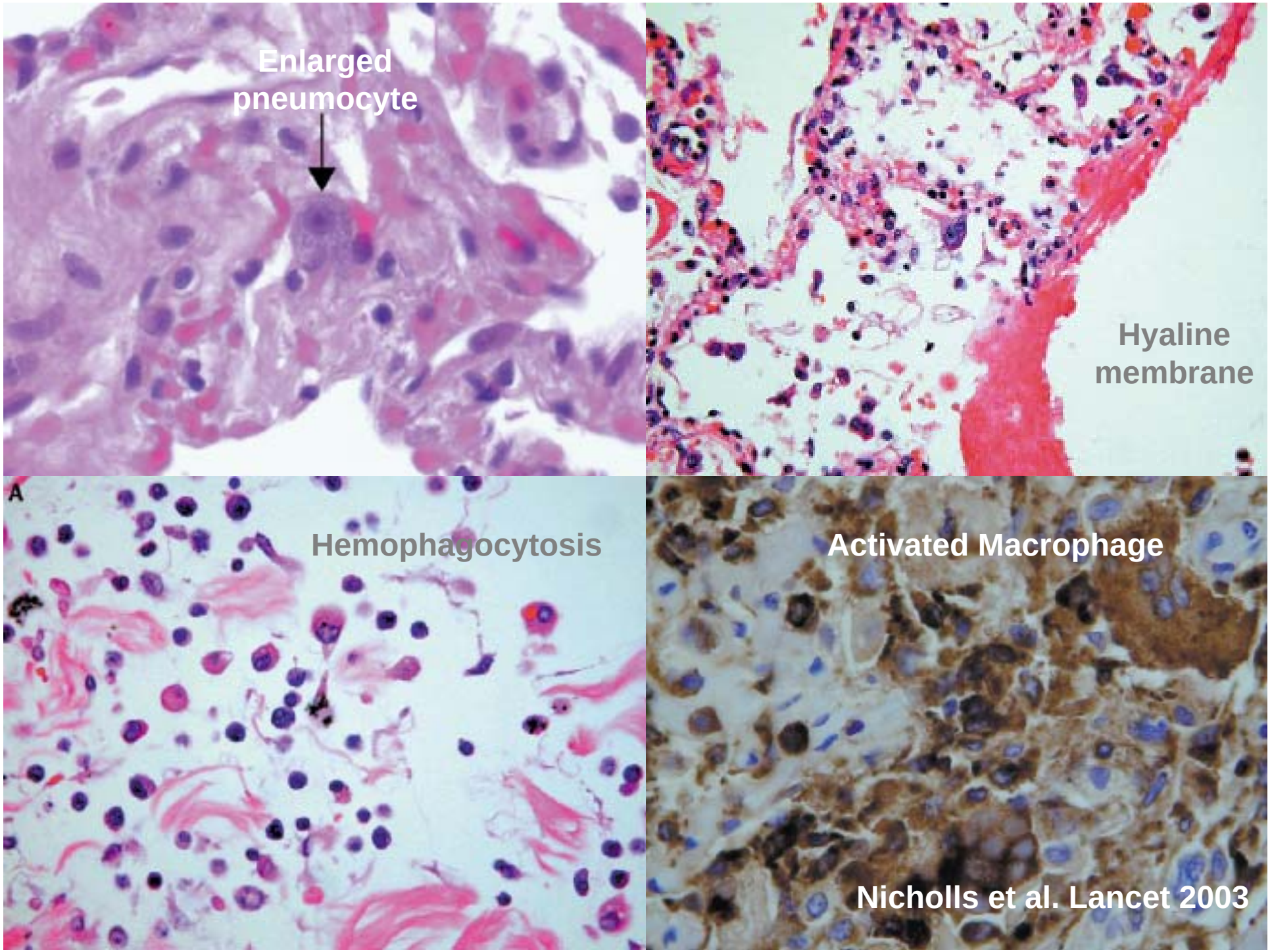


Wong KT et al.
Radiology 2003

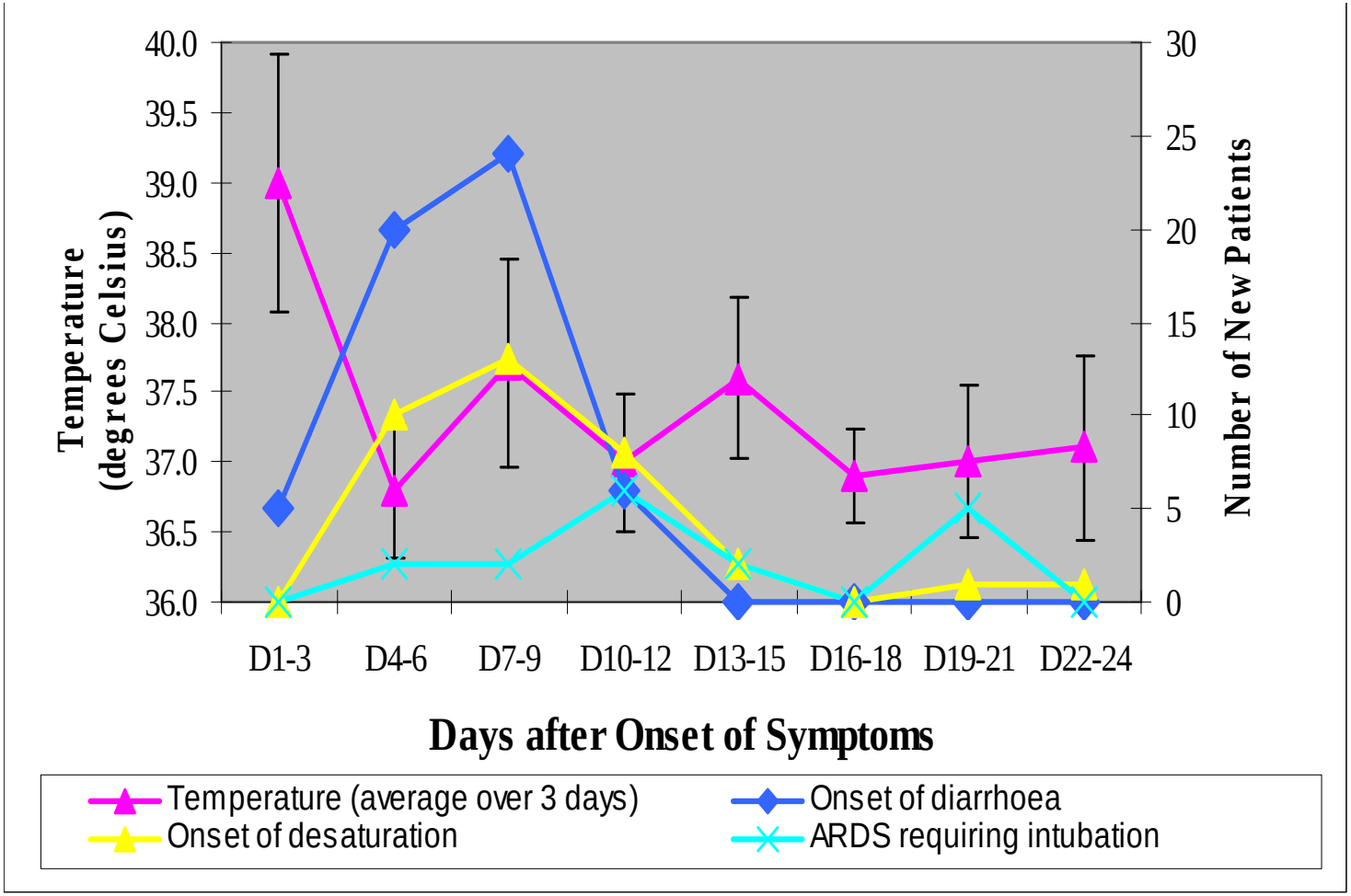
Early signs of SARS in HRCT



Antonio G et al. Radiology 2003


Enlarged pneumocyte
Hyaline membrane
A
Hemophagocytosis
Activated Macrophage
Nicholls et al. Lancet 2003

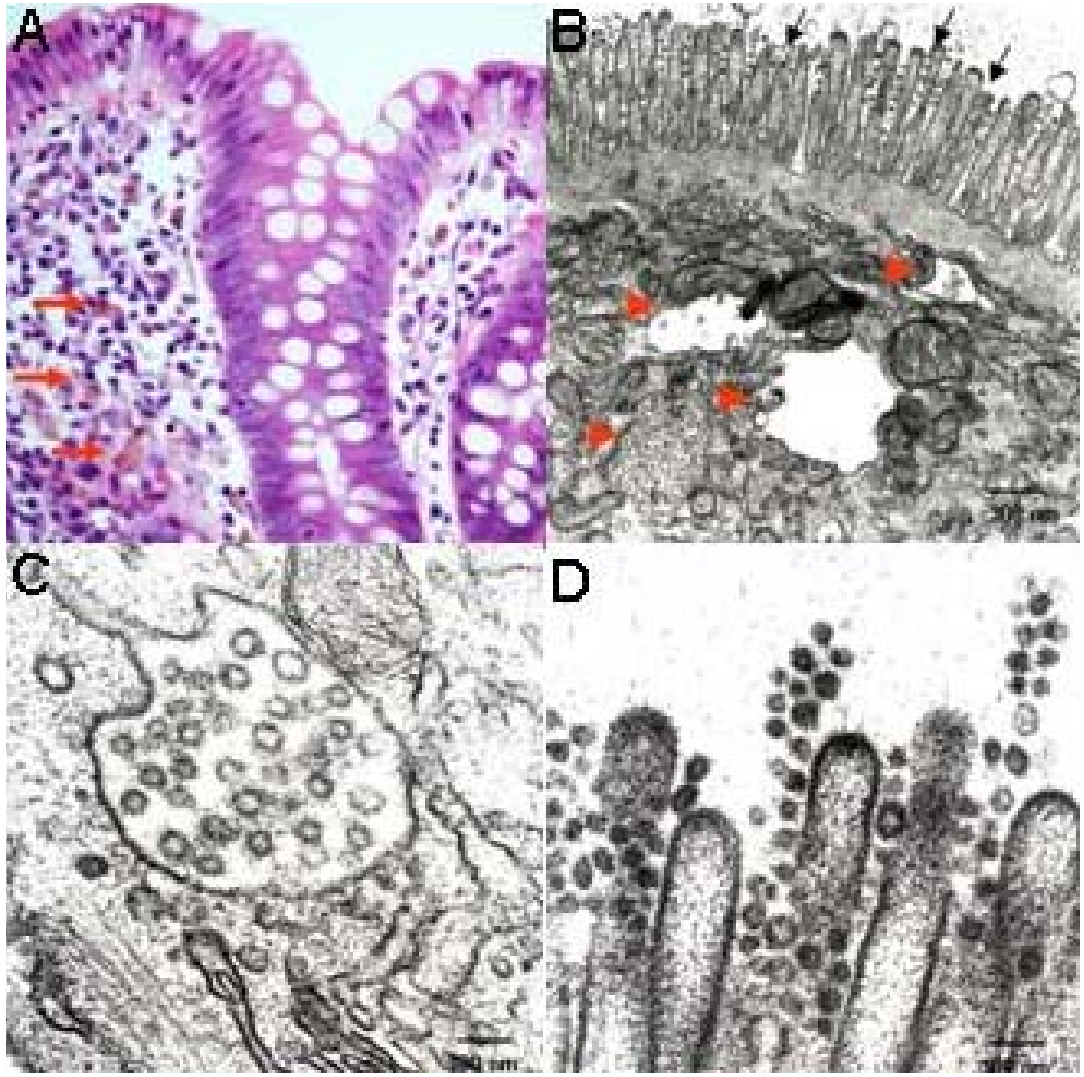
Clinical Course of SARS



N=75

Peiris et al. Lancet 2003

Colon



A. lipofusin-laden macrphage

B. Dilated ER & viral particle at microvilli

C. Vesicles containing viral particles

D. Viral particles on the luminal surface of villi

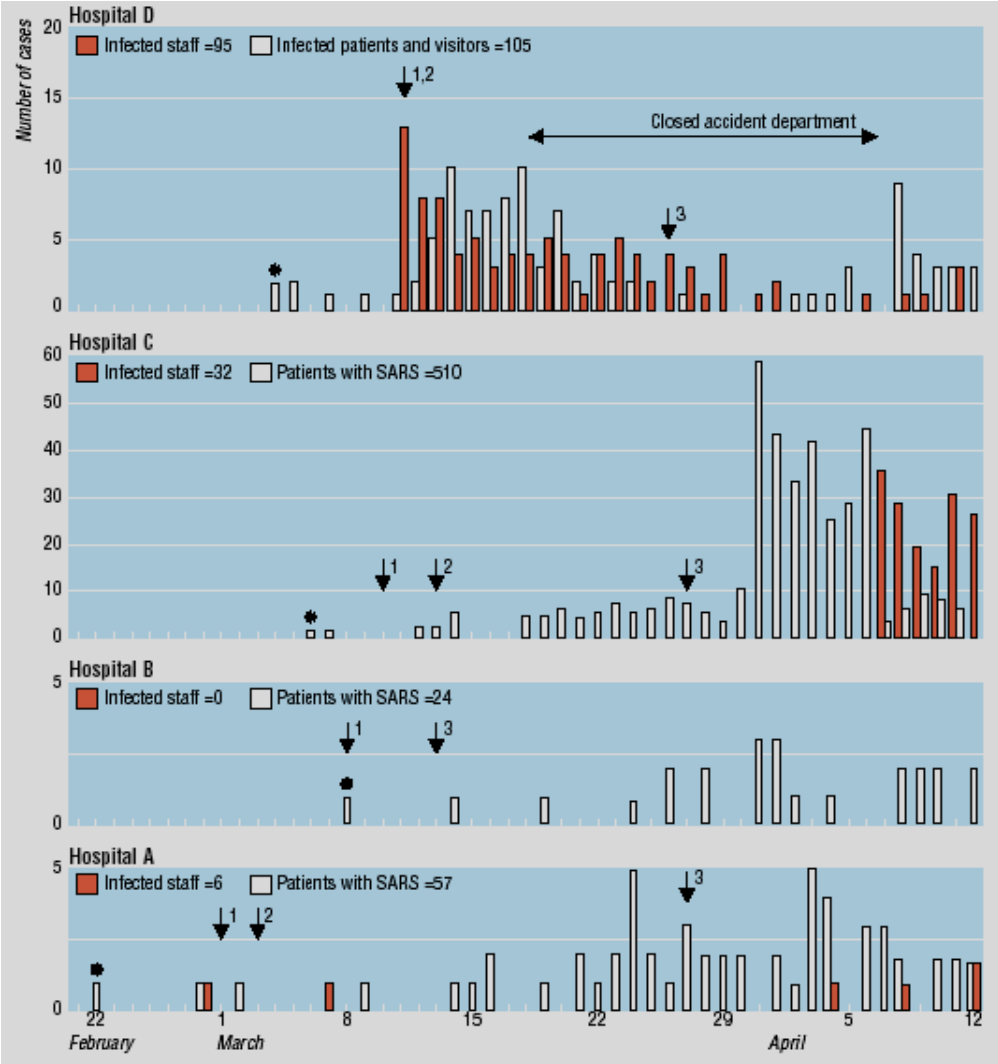
Hospital Outbreaks in Hong Kong

Admission of unsuspected cases in general ward caused serious cross-infection

Use of nebulizer and high flow-rate oxygen mask resulted in massive health care worker infection

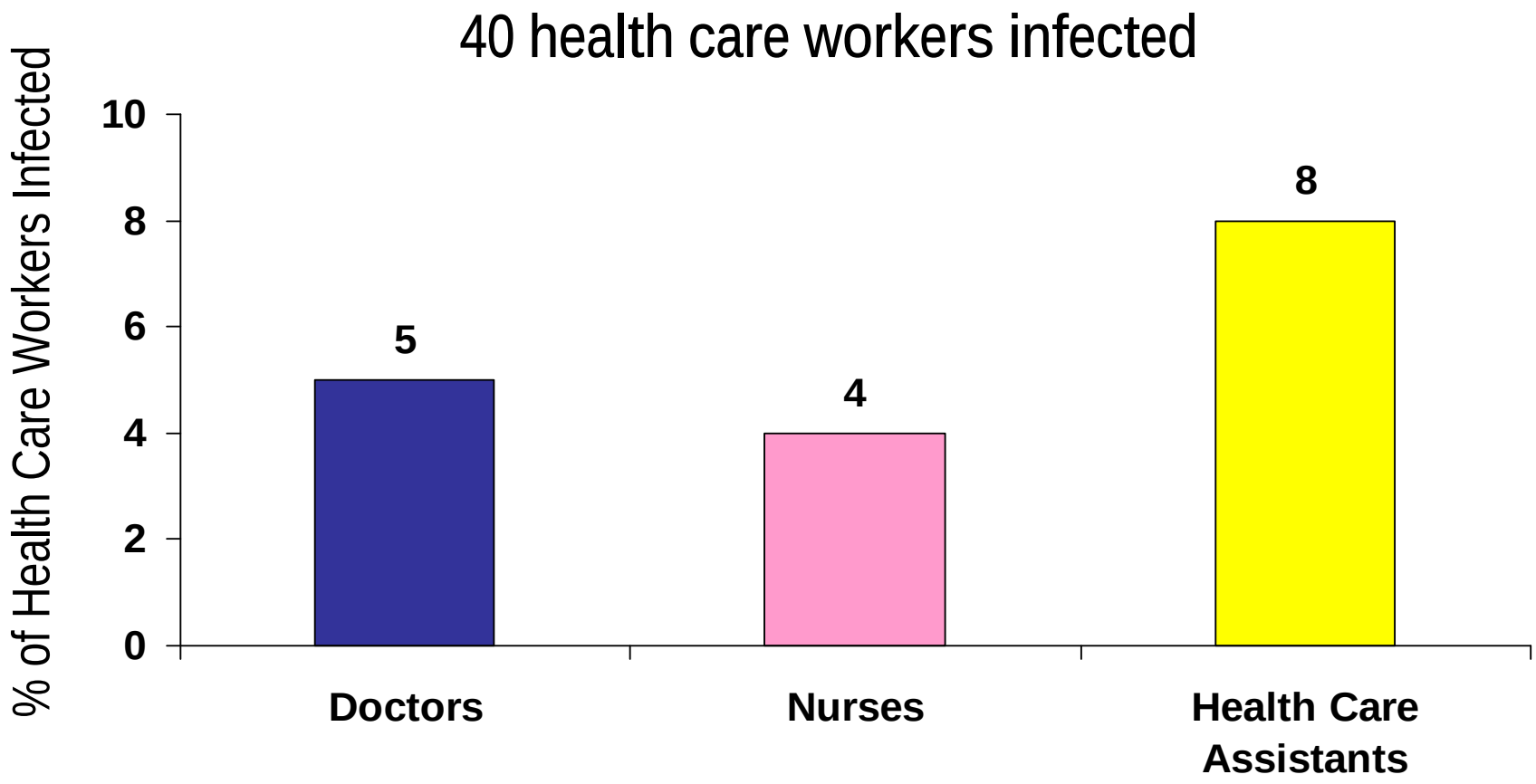
Density of SARS patients (viral load) correlates with the risk of hospital spread

Isolating probable cases and cohorting suspected cases effectively control cross-infection in hospital



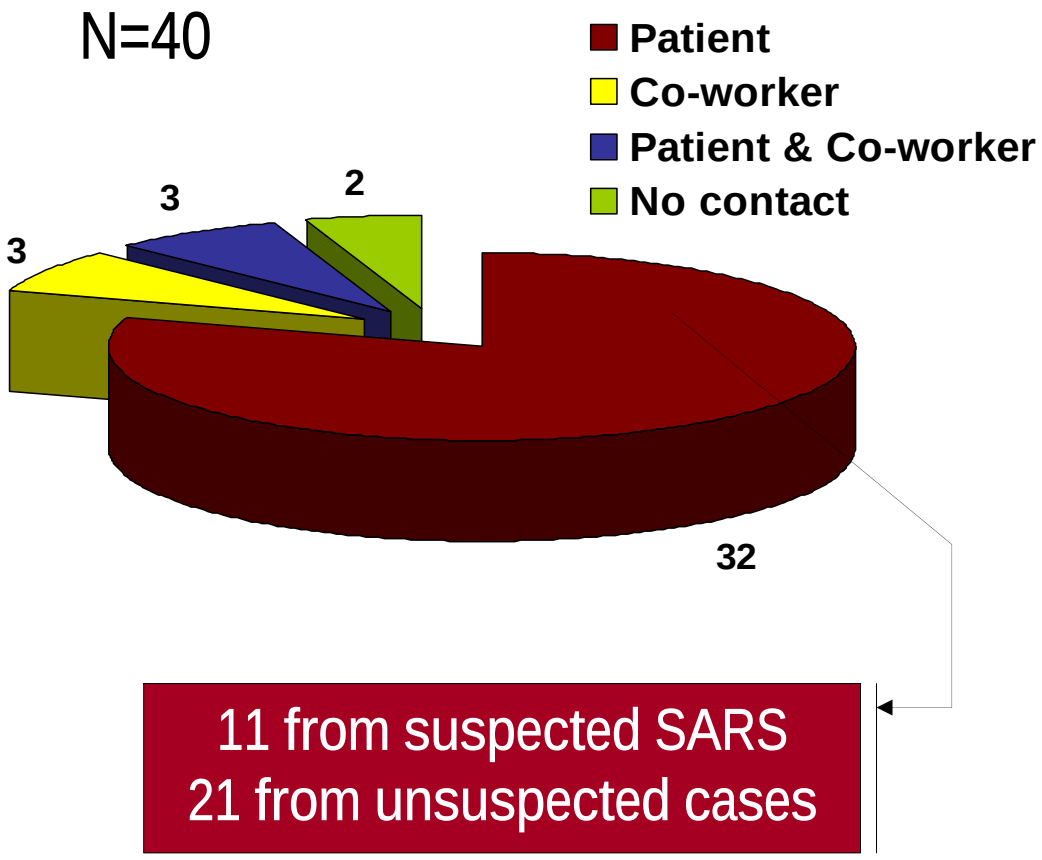
Chan, Seto & Sung. Br Med J 2003

Hospital Outbreak at AHNH

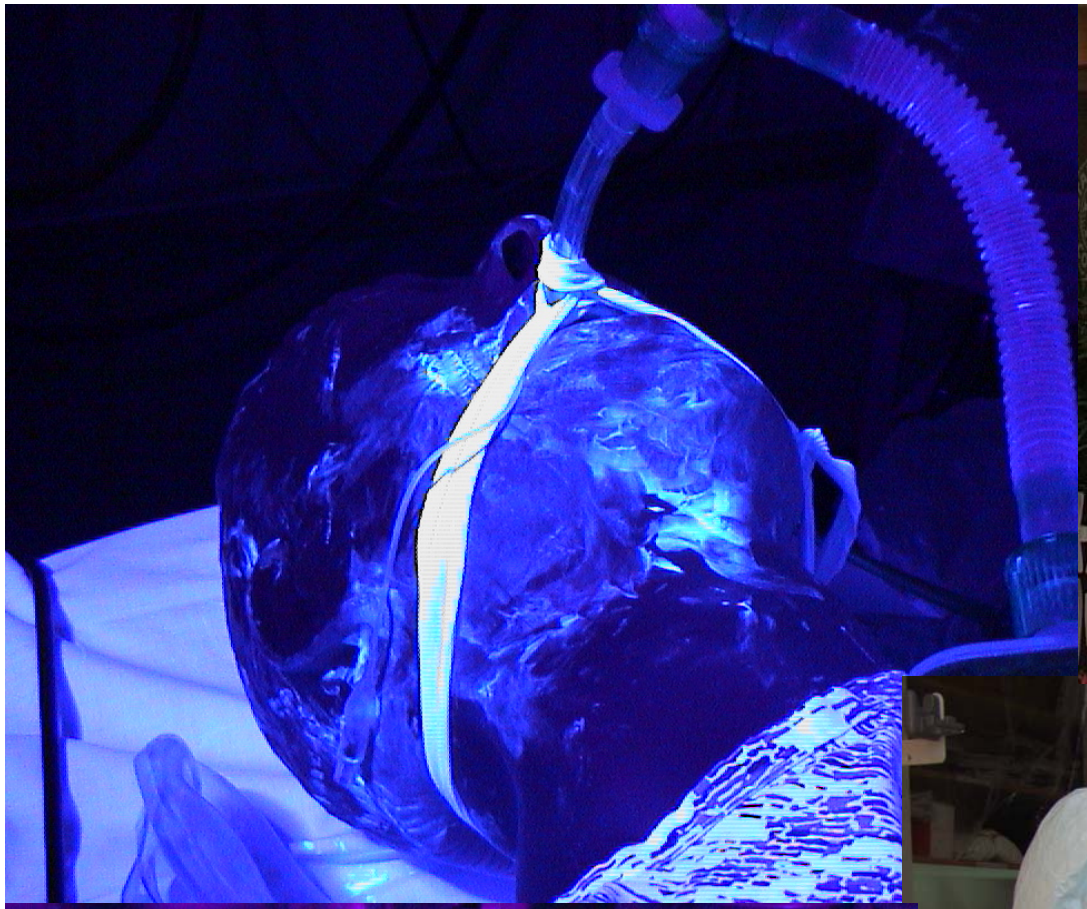


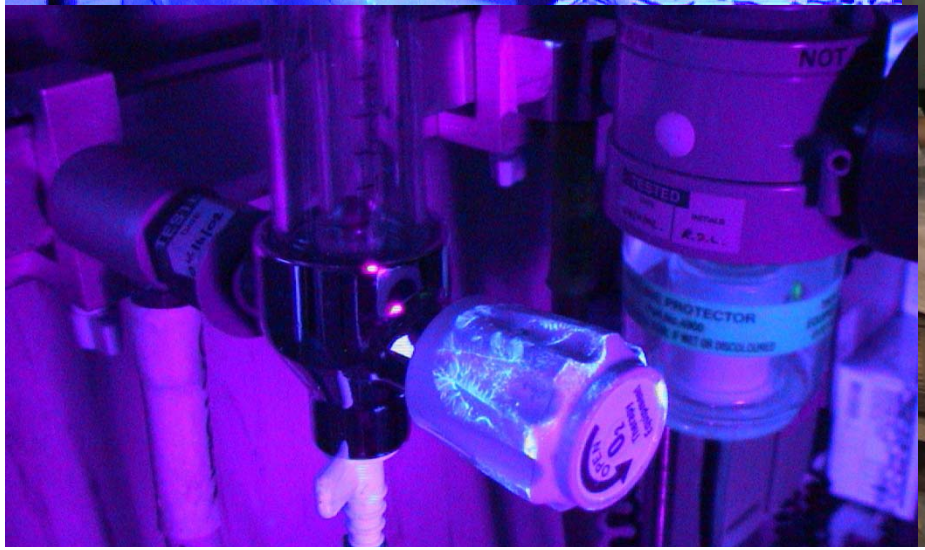
Ho, Sung & Chan. Ann Intern Med 2003

Where did HCW contract SARS?

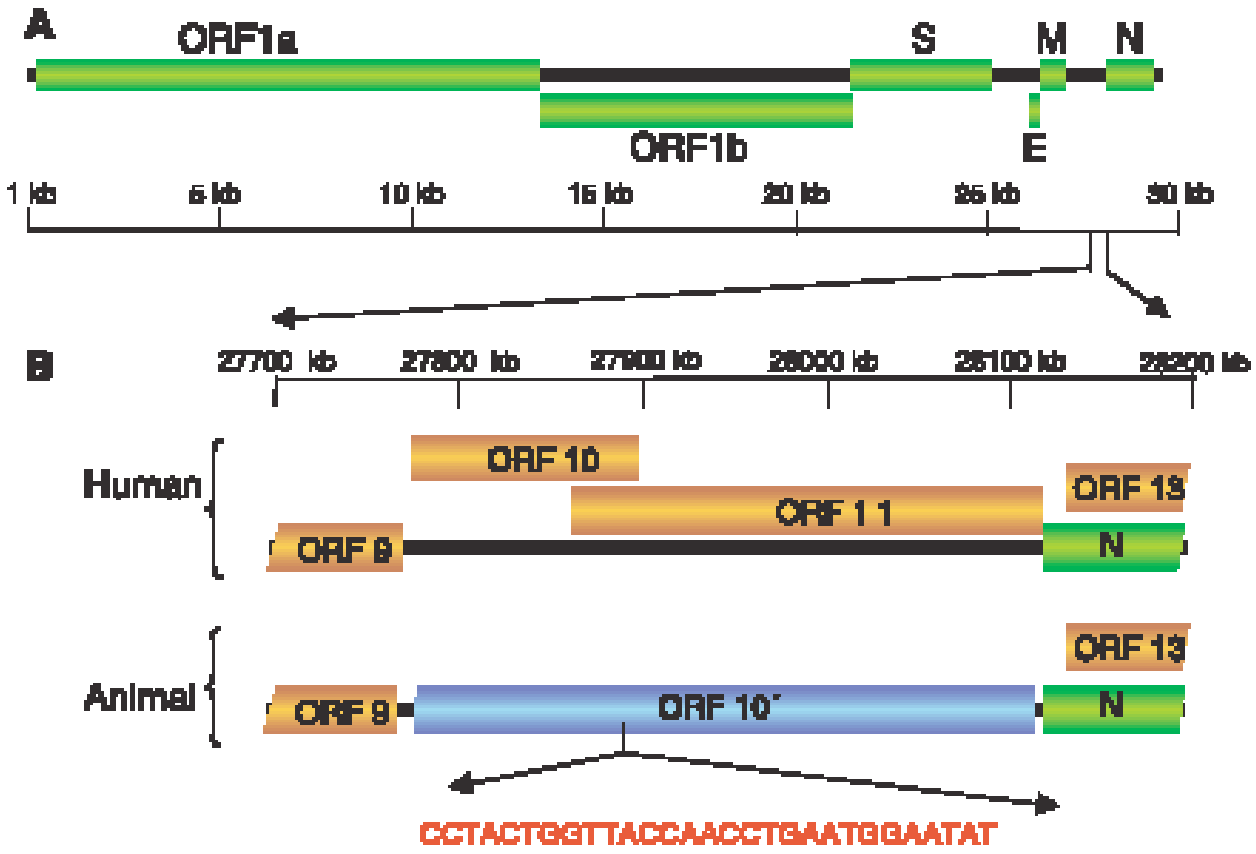


Ho, Sung & Chan. Ann Intern Med 2003





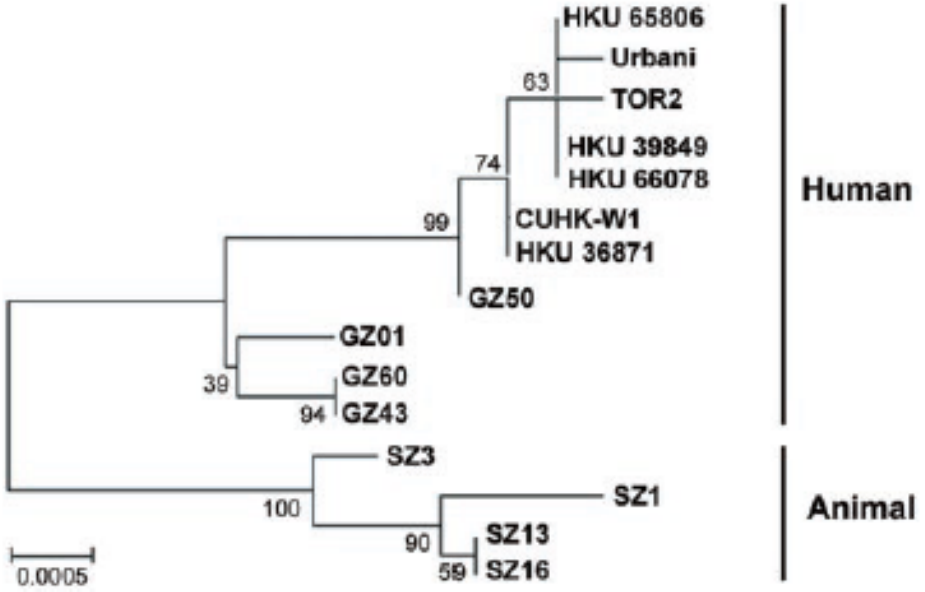
A 29-nt sequence in animals isolates results in fusing of ORFs 10 & 11 into a new ORF



Guan et al. Science 2003

Isolation and characterization of SARS-CoV from animals and animal handlers

Guan et al.
Science 2003



Occupation	Sample number	Antibody positive (%)
Wild-animal trader	20	8 (40)
Slaughterer of animals	15	3 (20)
Vegetable trader	20	1 (5)
Control	60	0 (0)

Where do SARS-CoV come from?


津源
JINYUAN

追求最出色的新闻 Guangzhou Daily
广州日报
国内统一刊号 CN44——0010 第14675号
2004年1月11日 星期日 农历癸未年 十二月二十 三十大寒 今日20版 广州地区24版
报料热线:81919191 http://www.dayoo.com

"We refuse eating exotic food"

Signed by 1500 students from Shenzhen, Guangdong. Jan.11.2004

Guangzhou Daily
Jan.11.2004

深圳千五名小学生签名:

我们不吃野生动物

前日上午,1500多双稚嫩的小手郑重签下了自己的承诺——来自深圳市罗湖区洪湖小学31个班的全体学生和100多名教职工在"拒食野生动物树立文明新风"的横幅上签上了自己的名字。

前日,该校校长带领学生们开始签名。五年(1)班的赖宇清同学签名后表示,今后她会自觉遵守拒吃野生动物的承诺,并让爸爸、妈妈也不买不吃野生动物。

罗湖区教育局有关负责人表示,学校教育孩子签名拒食野生动物,就是为了从小培养孩子们健康的饮食习惯。

目前,罗湖区已经在全区的学校中启动了相应的健康学校计划,在学校中开展各种健康教育。

记者何涛 通讯员属永清 摄

1500多名学生郑重承诺拒食野生动物

Flight CA 112, 15 March 2003

- One index patient, M/72, boarded CA 112
- Fever since Mar 11
- Subsequently died of SARS
- As of June 12, 22 cases associated with this flight

Transmission of SARS on Aircraft

Table 1. Frequency of Transmission on Three Aircraft Carrying One or More Persons Given a Diagnosis of a Probable Case of SARS.*

Flight No.	Model of Aircraft	Date of Flight	Duration of Flight	Phase of Illness (no. of patients)	No. Believed to Have Become Infected/Total No. of People on Aircraft (% [95% CI])	No. Who Became Ill/ No. Interviewed (% [95% CI])†
1	777-300	Feb. 21, 2003	90 min	Incubation (1)‡	0/315 (0 [0–1.2])	0/74 (0 [0–4.9])
2	737-300	Mar. 15, 2003	3 hr	Fever with cough (1)	22/120 (18.3 [11.9–26.4])	18/65 (27.7 [17.3–40.2])
3	777-300	Mar. 21, 2003	90 min	Fever (2); fever with cough (2)	1/246 (0.4 [0–2.2])	1/166 (0.6 [0–3.3])§

* The 95 percent confidence intervals (CIs) given are the exact binomial 95 percent confidence intervals around point estimates. SARS denotes the severe acute respiratory syndrome.
† Illness was defined as fever with cough, shortness of breath, or difficulty breathing. The number of patients who became ill excludes the index patient or patients.
‡ The incubation phase is defined as the 10 days before the onset of fever.
§ Illness in the one passenger who became ill met the WHO criteria for a suspected case of SARS; no chest radiograph was obtained.

CDC (US) and DH (HK), NEJM 2004

Transmission of SARS on Aircraft

Seated within 3 rows in front of the Index patient RR of SARS=3.1

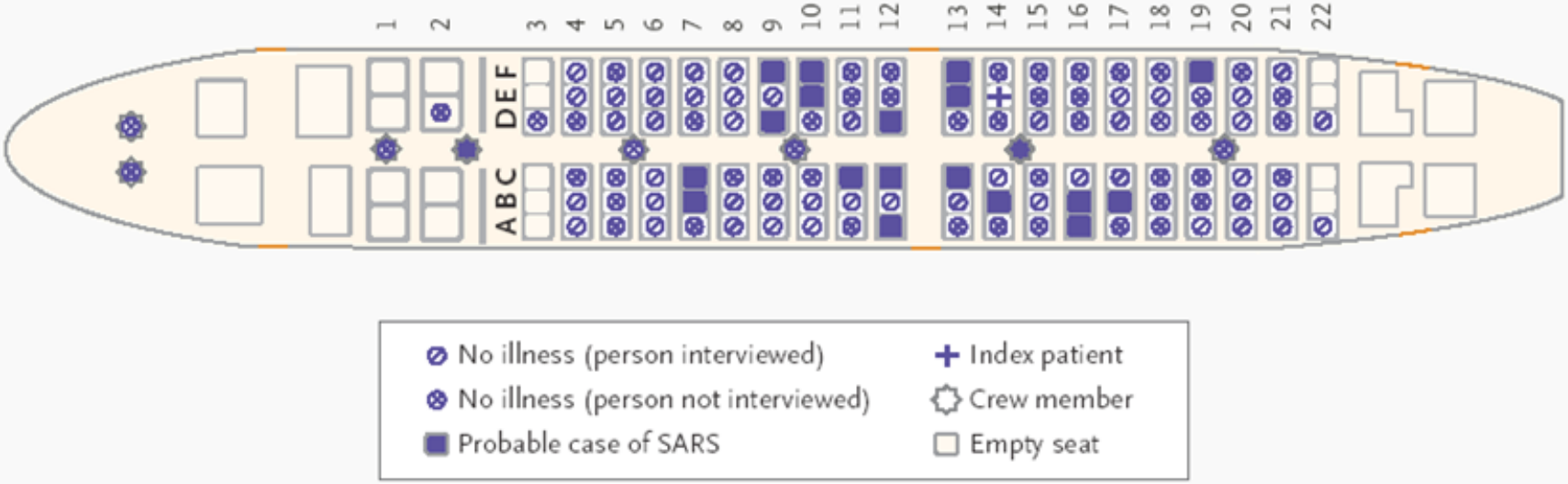
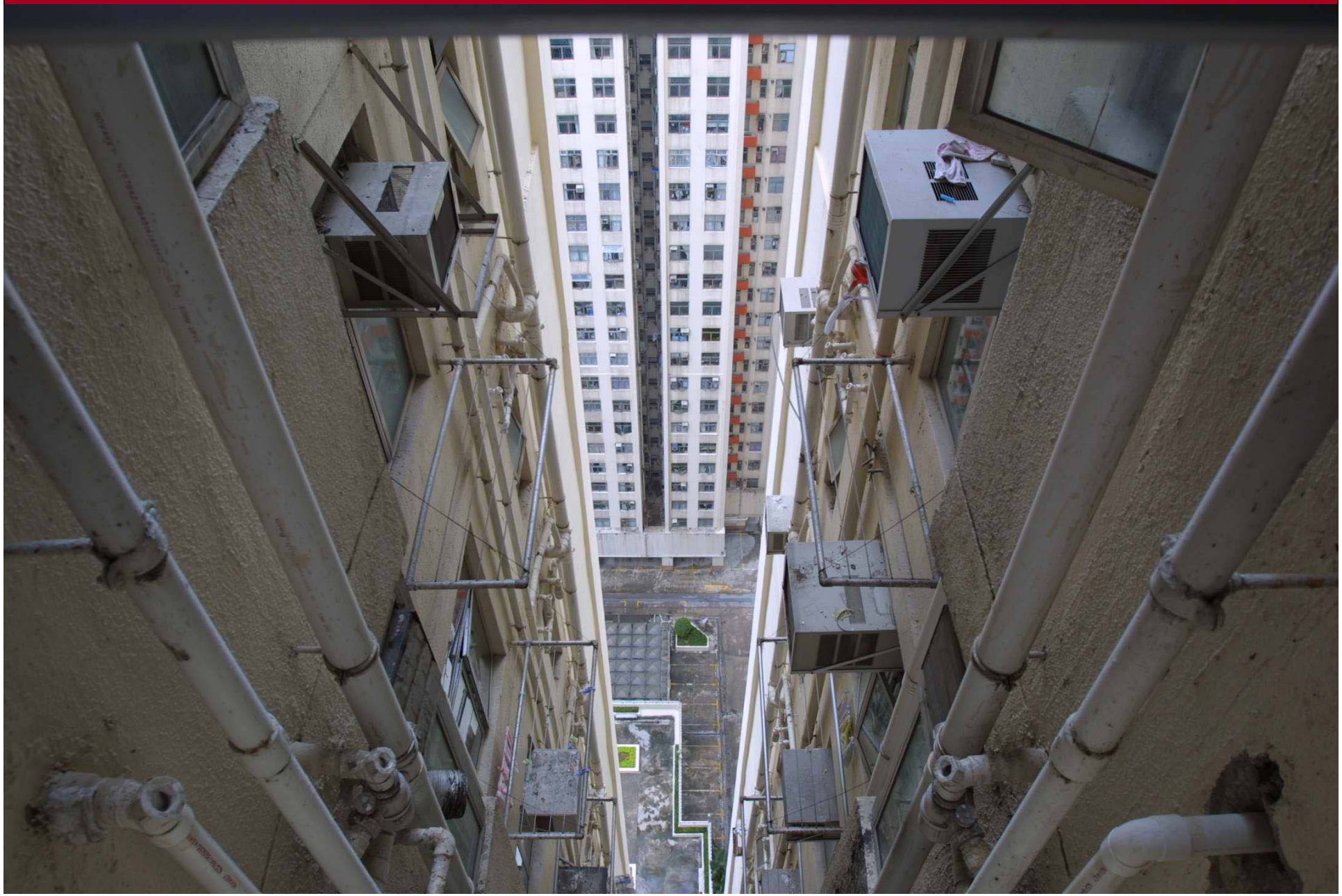


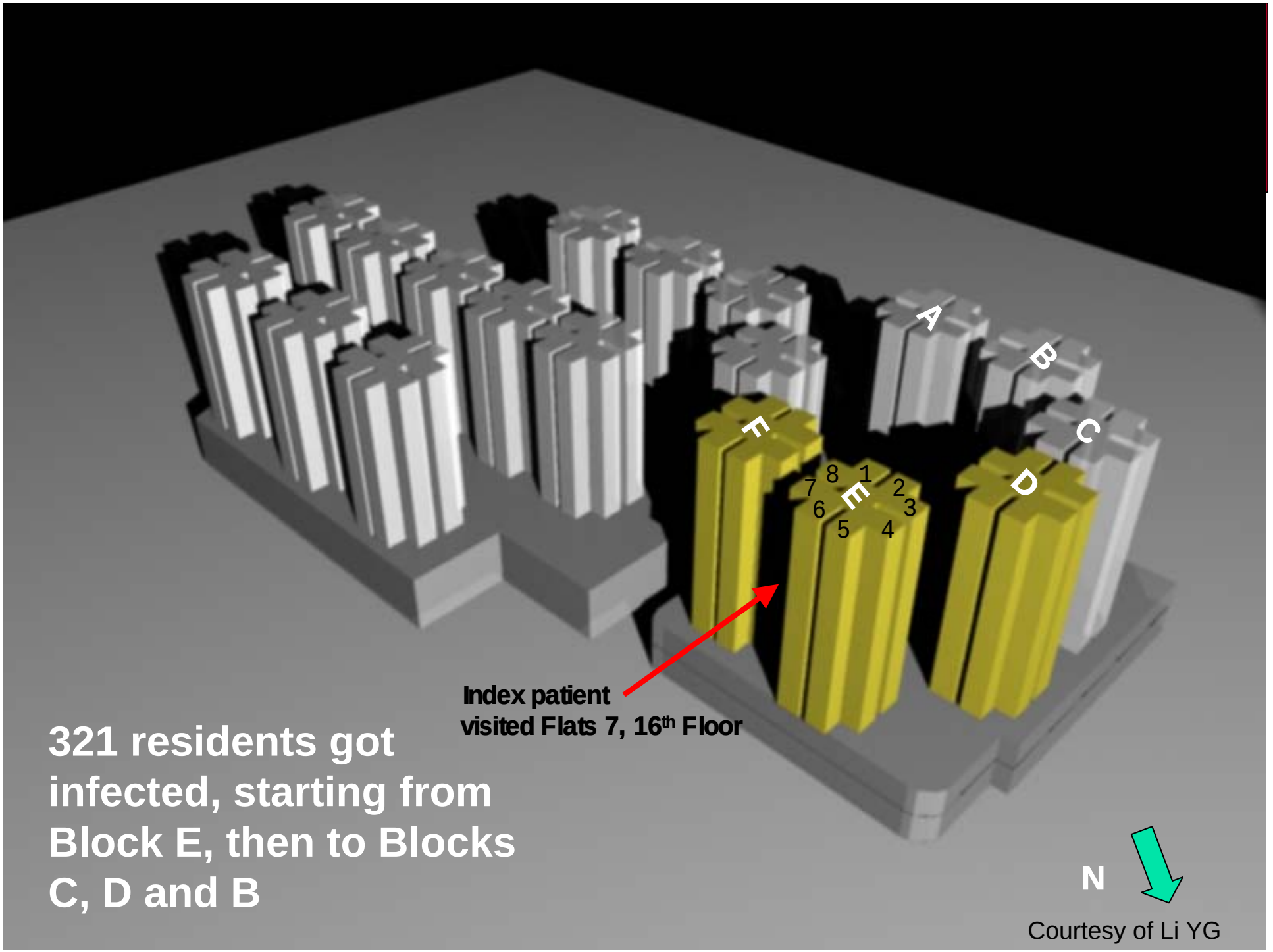
Figure 2. Schematic Diagram of the Boeing 737-300 Aircraft on Flight 2 from Hong Kong to Beijing.

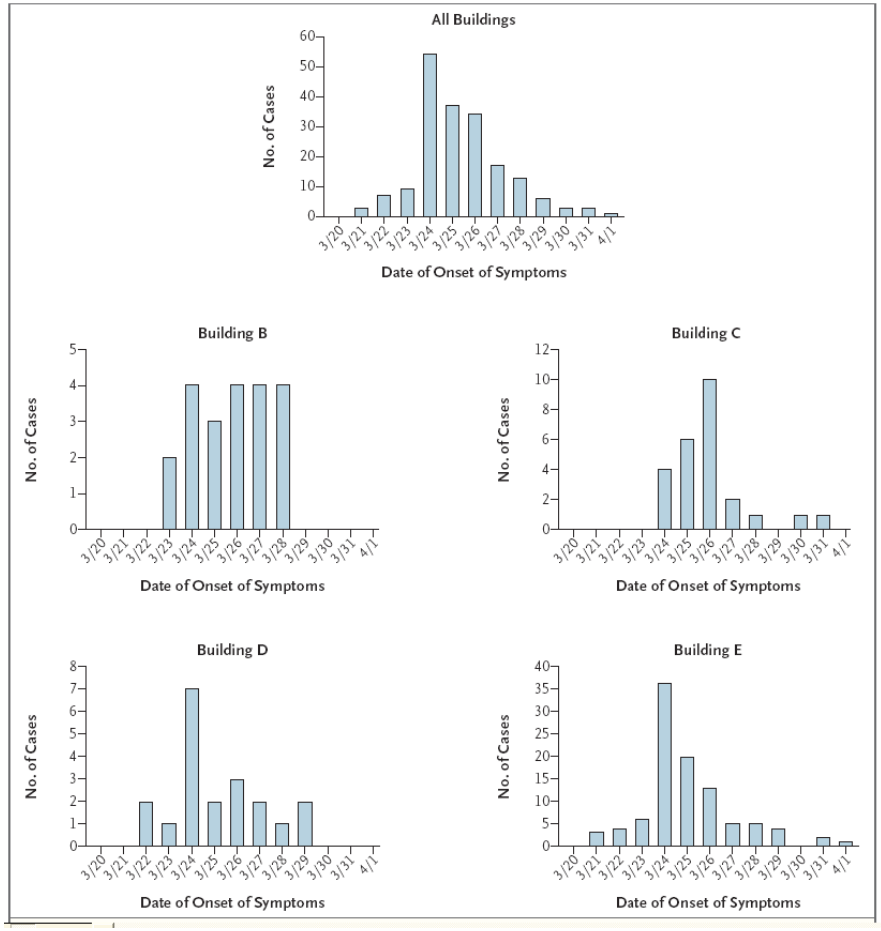
Two flight attendants and two Chinese officials also reportedly had illness that met the WHO criteria for a probable case of SARS. The flight attendants are shown here as members of the crew. The seat locations of the two Chinese officials are unknown, and they are not included in the diagram.

Olsen et al. NEJM 2004

Amoy Garden, Hong Kong



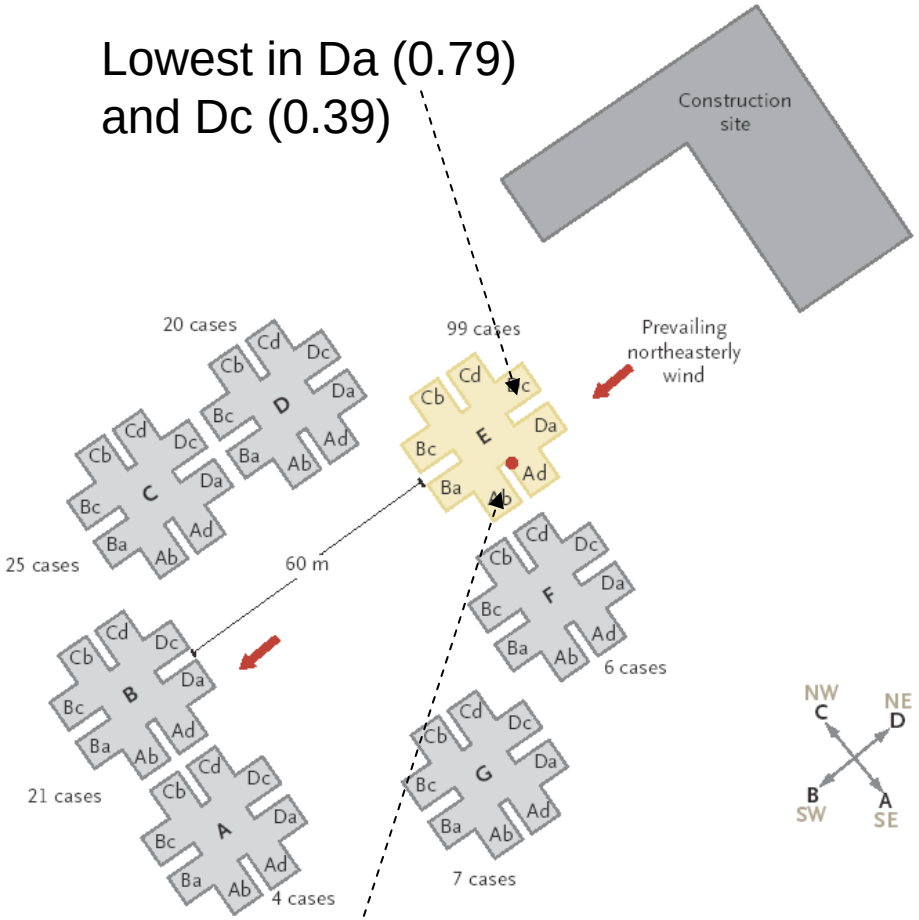

A
B
C
D
E
F
1
2
3
4
5
6
7
8
Index patient
visited Flats 7, 16th Floor
321 residents got infected, starting from Block E, then to Blocks C, D and B
N
Courtesy of Li YG



Epidemic curve of Block E is almost
Identical with the curve of all cases

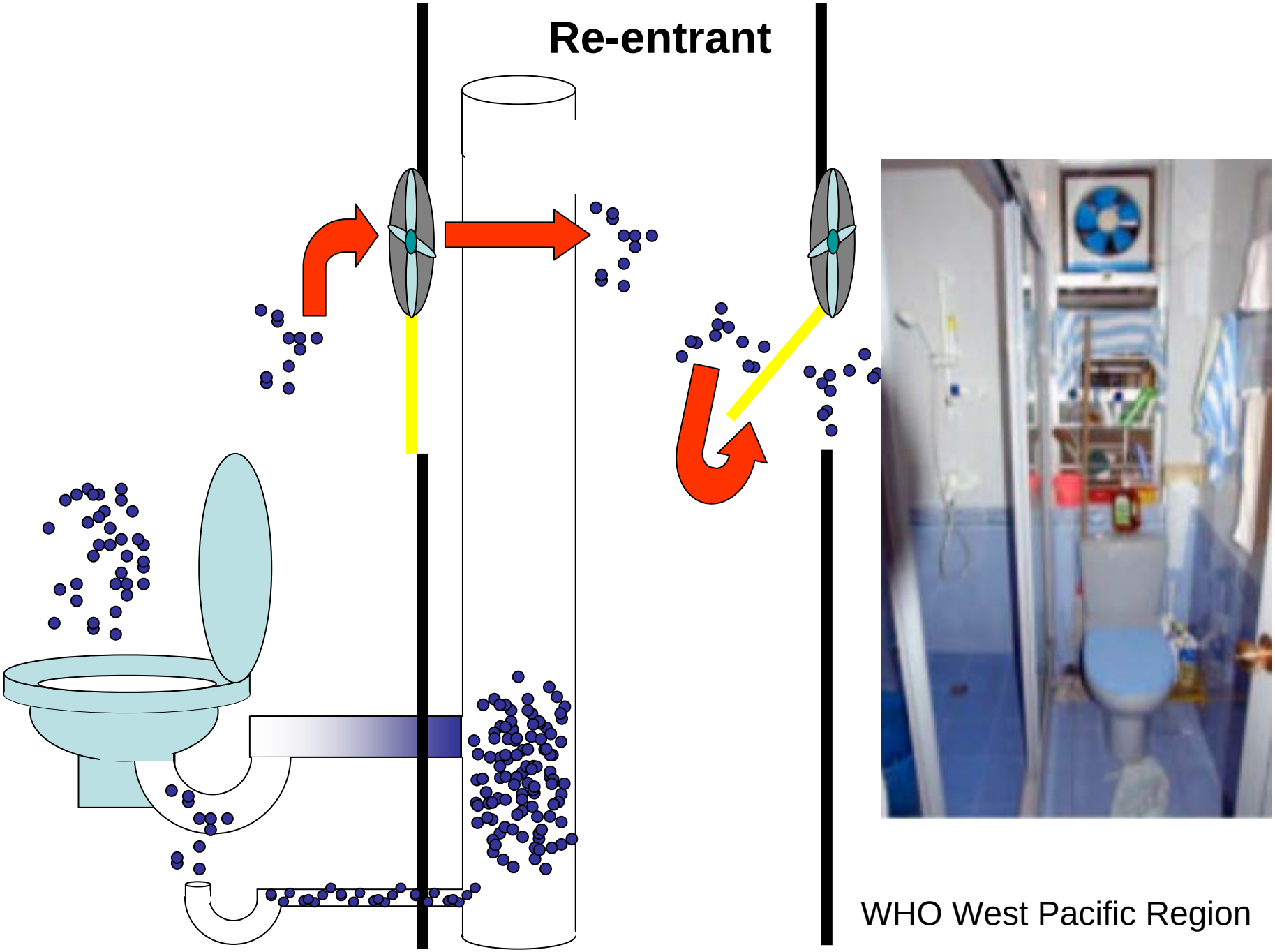
Relative Risk of Unit Infection
Middle levels (14-23/F) 5.1
High levels (24-36/F) 3.1

Lowest in Da (0.79)
and Dc (0.39)



RR of Unit Infection
Highest in Ab (14.5) and Ad (3.9)

Yu et al. NEJM 2004



WHO West Pacific Region

Computational fluid-dynamic modeling of Air Flow

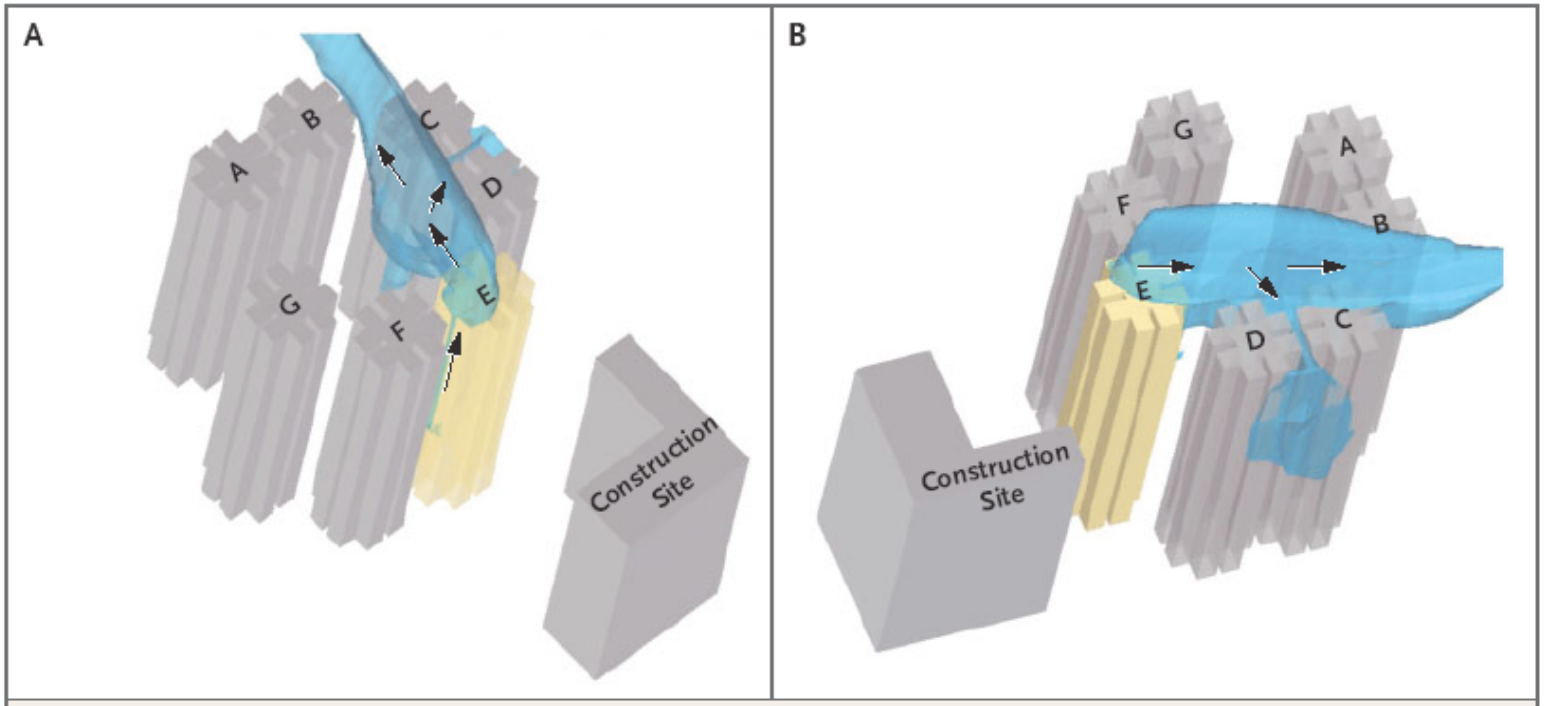
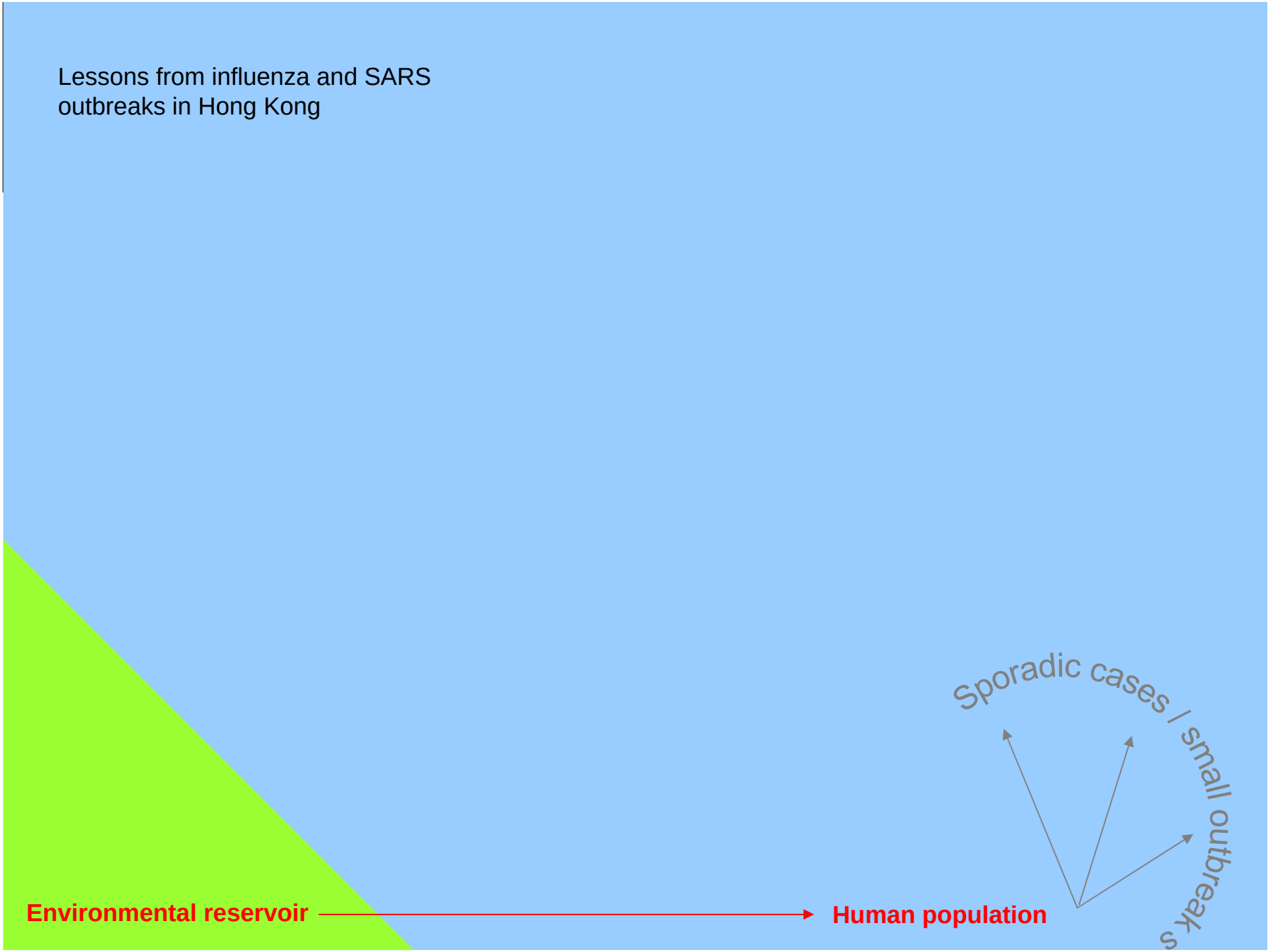


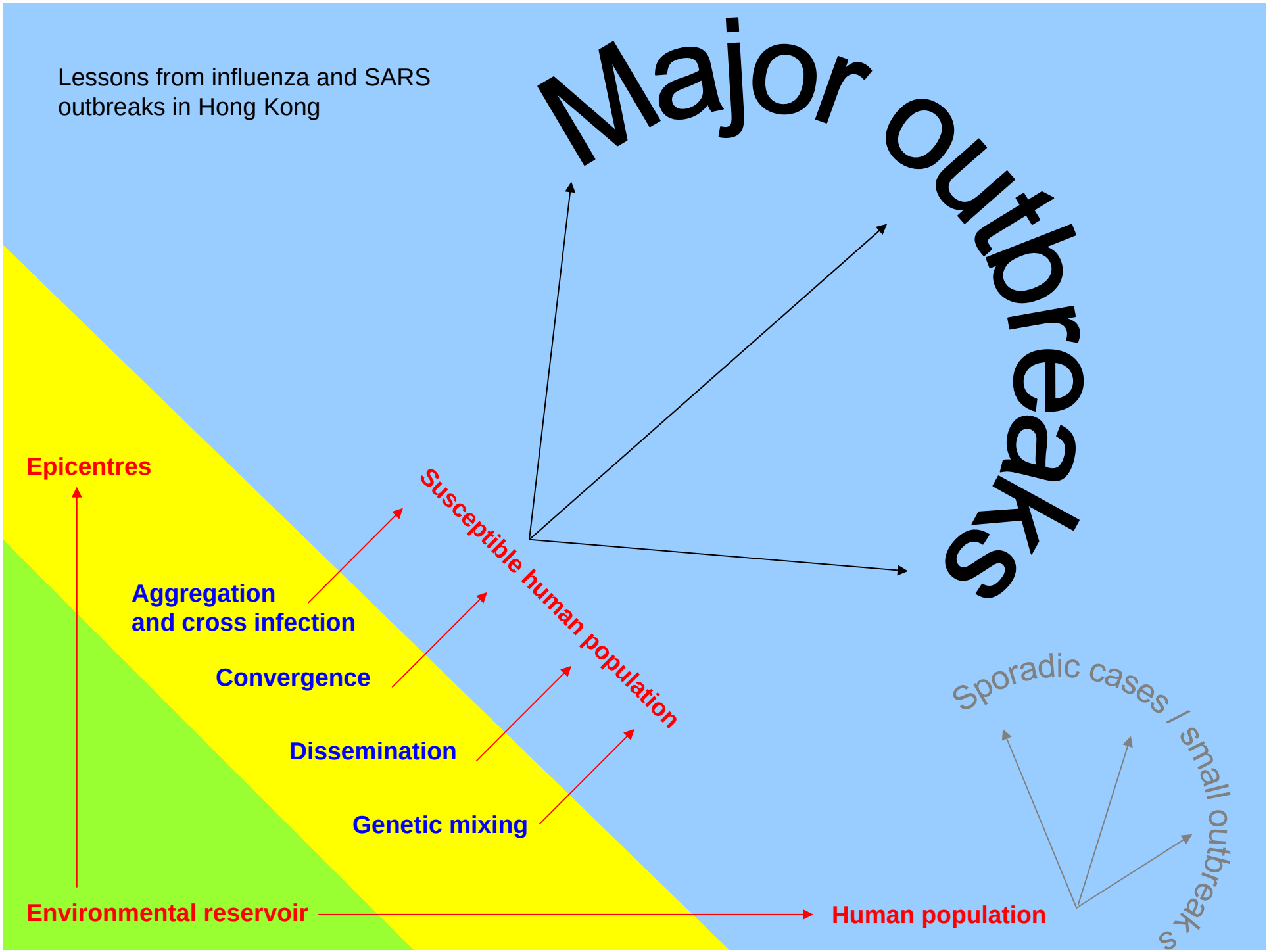
Figure 3. Model of the Movement of the Virus-Laden Plume.

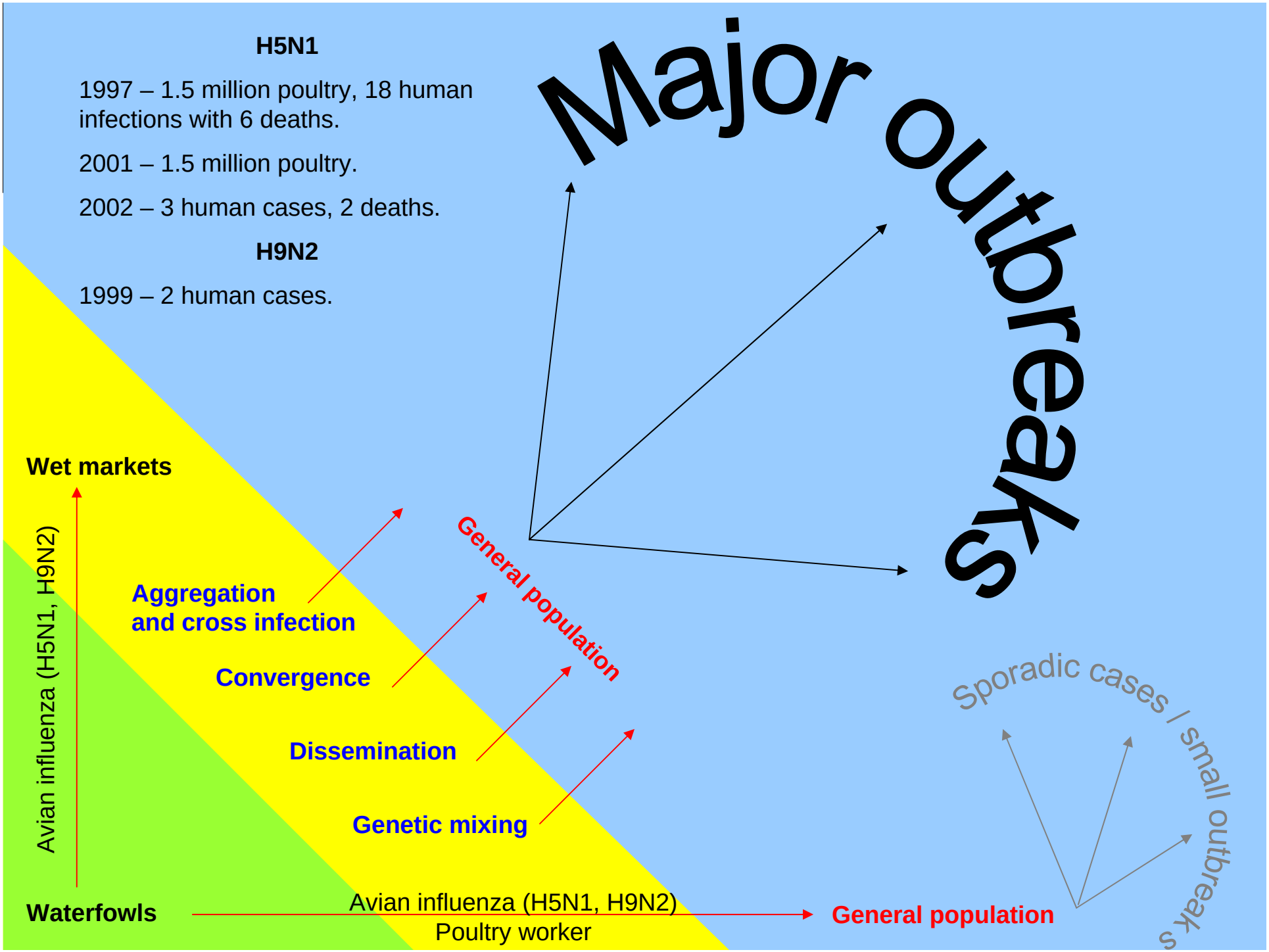
According to our computational fluid-dynamics modeling, the buoyant plume (blue) rose from the air shaft between two housing units in building E (yellow) and was carried by a northeasterly wind toward the middle-level floors in buildings C and D. The L-shape structure (Panels A and B) was a nearby construction site that blocked the wind flowing toward lower-level floors in buildings E, C, and D. The wake flow of the construction site created a region of negative air pressure in the space between buildings E, C, and D (Panel B) that caused the plume to bend downward, toward buildings C and D.

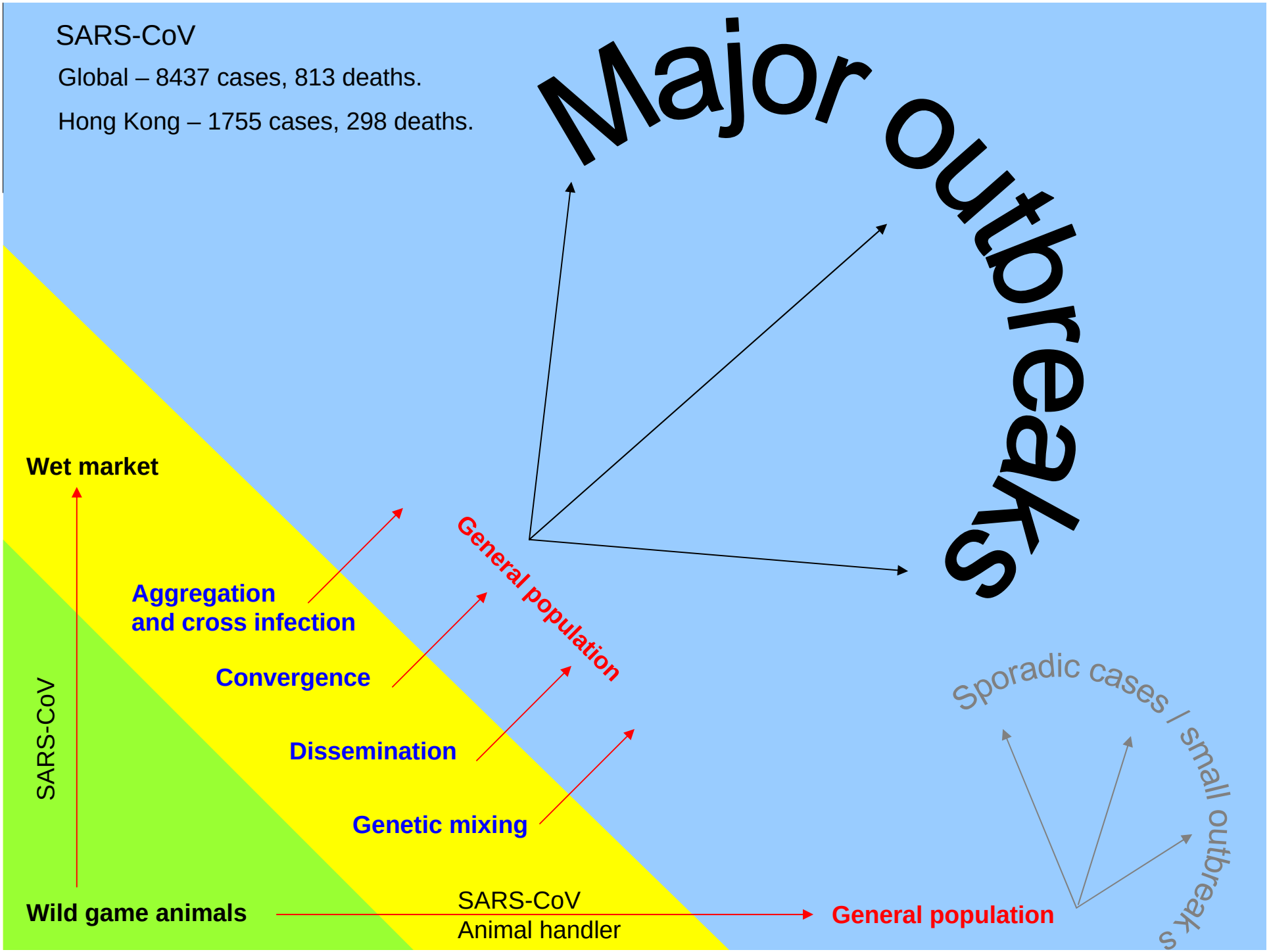
Yu et al. NEJM 2004

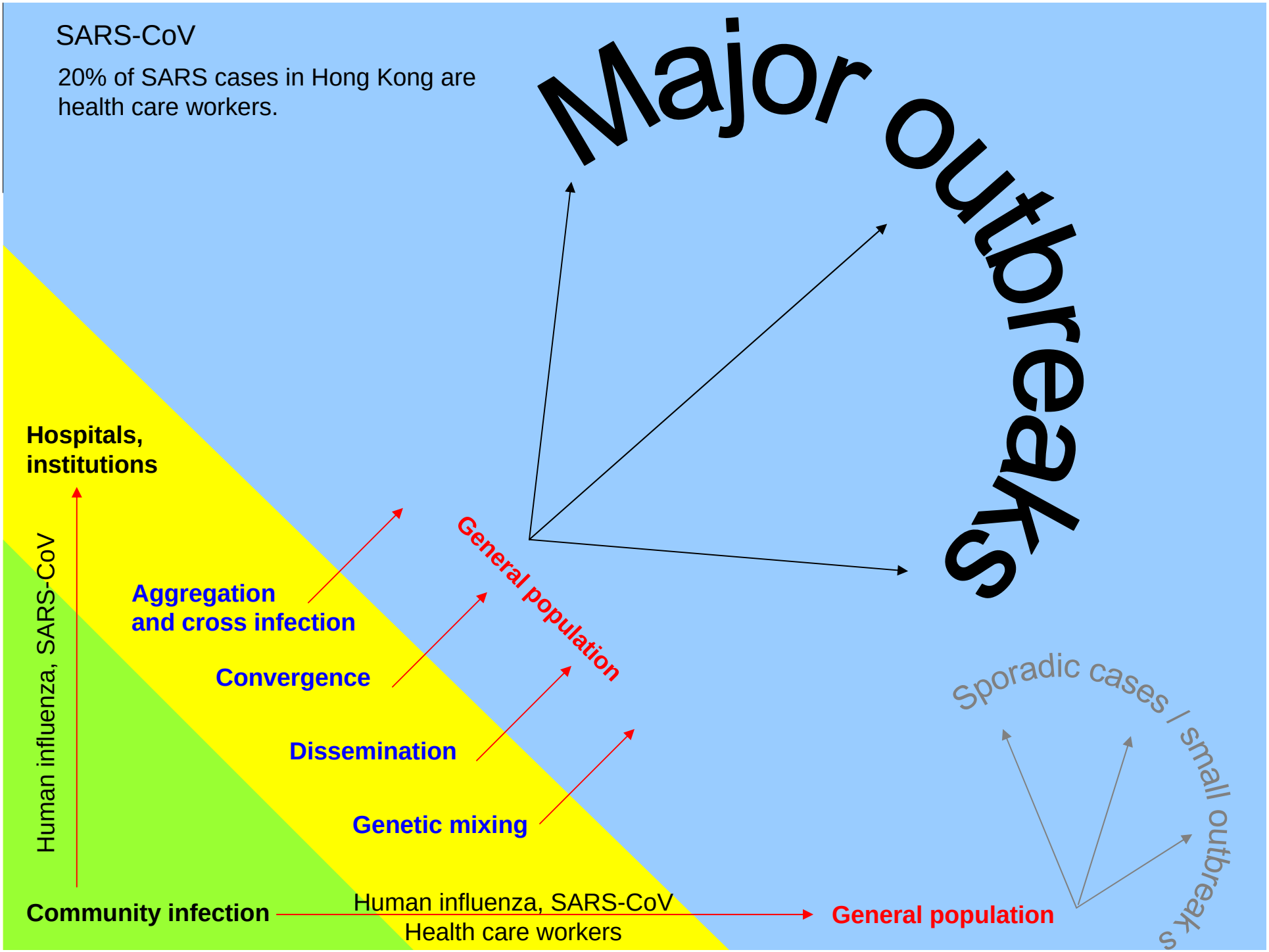
Lessons from influenza and SARS outbreaks in Hong Kong



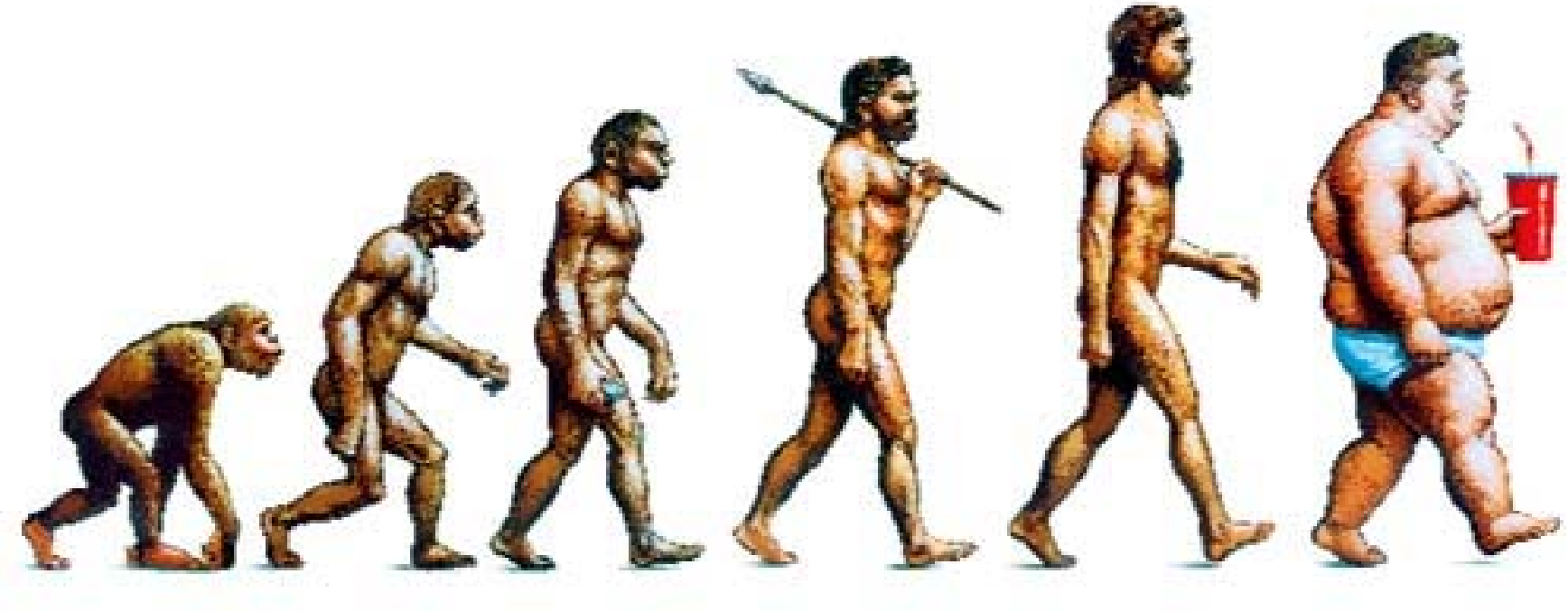

Lessons from influenza and SARS outbreaks in Hong Kong
Major outbreaks
Epicentres
Susceptible human population
Aggregation and cross infection
Convergence
Dissemination
Genetic mixing
Environmental reservoir
Human population
Sporadic cases / small outbreaks


H5N1
1997 – 1.5 million poultry, 18 human infections with 6 deaths.
2001 – 1.5 million poultry.
2002 – 3 human cases, 2 deaths.
H9N2
1999 – 2 human cases.
Major outbreaks
Wet markets
Avian influenza (H5N1, H9N2)
Aggregation and cross infection
Convergence
Dissemination
Genetic mixing
General population
Sporadic cases / small outbreaks
Waterfowls
Avian influenza (H5N1, H9N2)
Poultry worker
General population


SARS-CoV
Global – 8437 cases, 813 deaths.
Hong Kong – 1755 cases, 298 deaths.
Major outbreaks
Wet market
General population
Aggregation
and cross infection
Convergence
Dissemination
Genetic mixing
SARS-CoV
Sporadic cases / small outbreaks
Wild game animals
SARS-CoV
Animal handler
General population


SARS-CoV
20% of SARS cases in Hong Kong are health care workers.
Major outbreaks
Hospitals, institutions
Human influenza, SARS-CoV
Aggregation and cross infection
Convergence
Dissemination
Genetic mixing
General population
Community infection
Human influenza, SARS-CoV
Health care workers
General population
Sporadic cases / small outbreaks

What else is there threatening our life



Non-Infectious Diseases

The NEW ENGLAND JOURNAL of MEDICINE

ESTABLISHED IN 1812 APRIL 24, 2003 VOL. 348 NO. 17

Overweight, Obesity, and Mortality from Cancer in a Prospectively Studied Cohort of U.S. Adults

Eugenia E. Calle, Ph.D., Carmen Rodriguez, M.D., M.P.H., Kimberly Walker-Thurmond, B.A., and Michael J. Thun, M.D.

Obesity and Cancer

Calle et al. NEJM 2003

Type of Cancer	Body-Mass Index†					P for Trend
	18.5–24.9	25.0–29.9	30.0–34.9	35.0–39.9	≥40.0	
All cancers						
No. of deaths	13,855	15,372	2683	350	43	
Death rate‡	578.30	546.21	636.30	738.69	841.62	
RR (95% CI)§	1.00	0.97 (0.94–0.99)	1.09 (1.05–1.14)	1.20 (1.08–1.34)	1.52 (1.13–2.05)	0.001
All cancers						
No. of deaths	13,855	15,372	2683	393¶		
Death rate‡	578.30	546.21	636.30	749.86¶		
RR (95% CI)§	1.00	0.97 (0.94–0.99)	1.09 (1.05–1.14)	1.23 (1.11–1.36)¶		0.002
Esophageal cancer						
No. of deaths	329	452	81	14		
Death rate‡	13.97	15.74	18.07	24.18		
RR (95% CI)§	1.00	1.15 (0.99–1.32)	1.28 (1.00–1.63)	1.63 (0.95–2.80)		0.008
Stomach cancer						
No. of deaths	388	455	84	18		
Death rate‡	16.24	16.09	20.34	33.99		
RR (95% CI)§	1.00	1.01 (0.88–1.16)	1.20 (0.94–1.52)	1.94 (1.21–3.13)		0.03
Colorectal cancer						
No. of deaths	1,292	1,811	337	54		
Death rate‡	53.51	64.43	79.50	101.25		
RR (95% CI)§	1.00	1.20 (1.12–1.30)	1.47 (1.30–1.66)	1.84 (1.39–2.41)		<0.001
Liver cancer						
No. of deaths	222	296	78	24		
Death rate‡	9.24	10.49	19.22	47.80		
RR (95% CI)§	1.00	1.13 (0.94–1.34)	1.90 (1.46–2.47)	4.52 (2.94–6.94)		<0.001
Gallbladder cancer						
No. of deaths	66	94	20			
Death rate‡	2.68	3.37	5.16			
RR (95% CI)§	1.00	1.34 (0.97–1.84)	1.76 (1.06–2.94)			0.02
Pancreatic cancer						
No. of deaths	740	961	182	25		
Death rate‡	31.07	33.98	42.20	48.80		
RR (95% CI)§	1.00	1.13 (1.03–1.25)	1.41 (1.19–1.66)	1.49 (0.99–2.22)		<0.001
Lung cancer						
No. of deaths	4,885	4,281	681	78		
Death rate‡	206.69	150.11	156.53	149.63		
RR (95% CI)§	1.00	0.78 (0.75–0.82)	0.79 (0.73–0.86)	0.67 (0.54–0.84)		<0.001

Obesity and Cancer (Men)

Calle et al. NEJM 2003

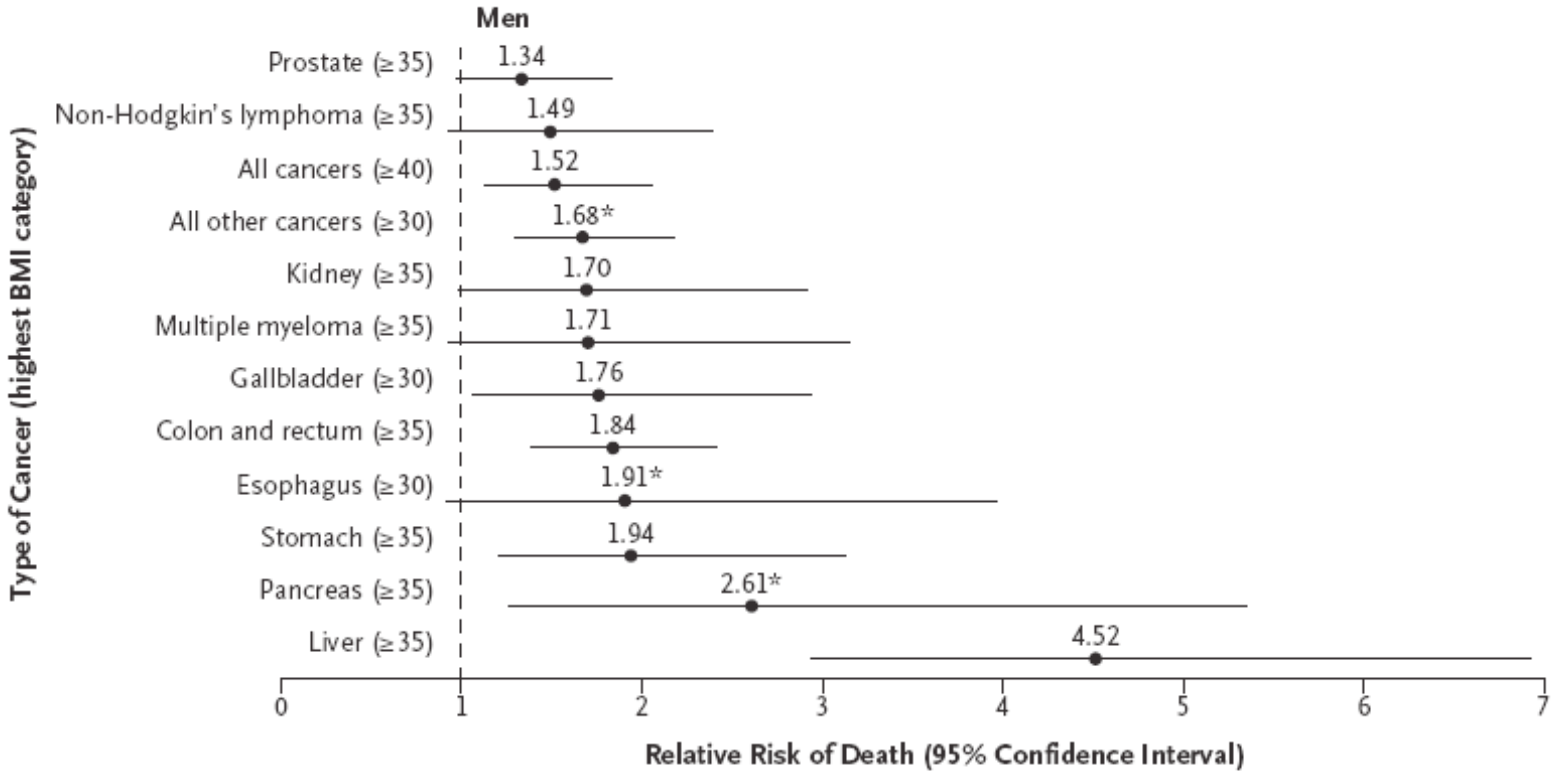


Figure 1. Summary of Mortality from Cancer According to Body-Mass Index for U.S. Men in the Cancer Prevention Study II, 1982 through 1998.

For each relative risk, the comparison was between men in the highest body-mass-index (BMI) category (indicated in parentheses) and men in the reference category (body-mass index, 18.5 to 24.9). Asterisks indicate relative risks for men who never smoked. Results of the linear test for trend were significant ($P \leq 0.05$) for all cancer sites.

Obesity and Cancer (Women)

Calle et al. NEJM 2003

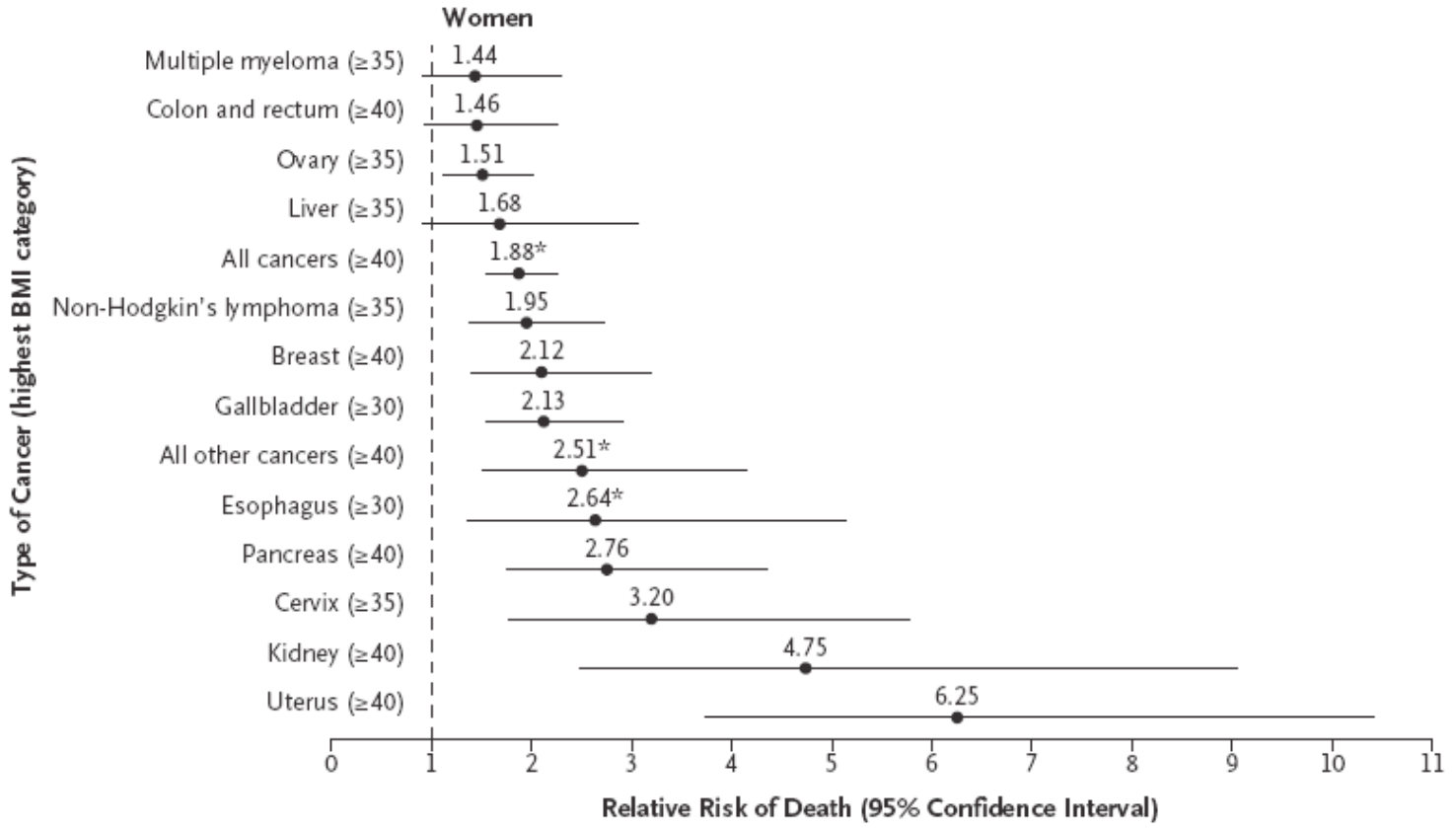
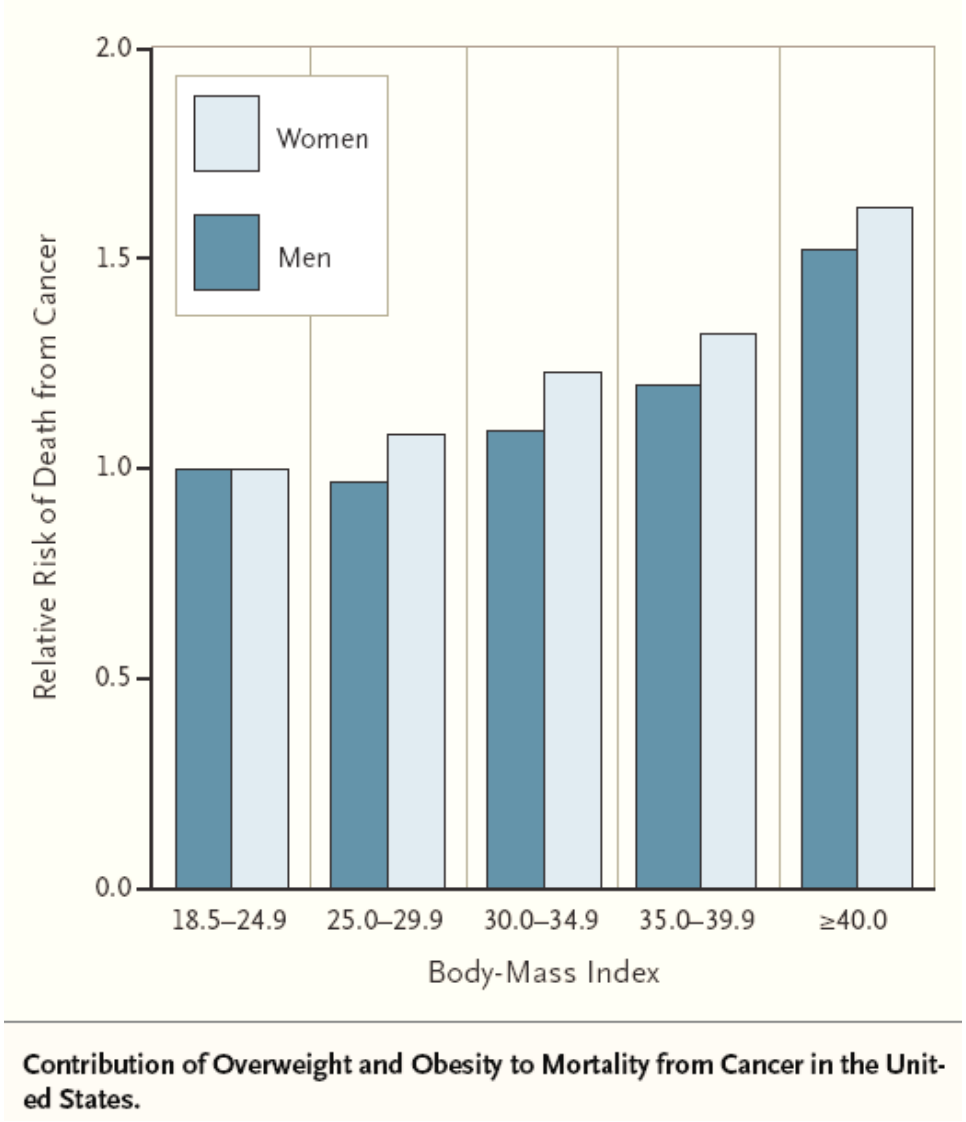


Figure 2. Summary of Mortality from Cancer According to Body-Mass Index for U.S. Women in the Cancer Prevention Study II, 1982 through 1998.

For each relative risk, the comparison was between women in the highest body-mass-index (BMI) category (indicated in parentheses) and women in the reference category (body-mass index, 18.5 to 24.9). Asterisks indicate relative risks for women who never smoked. Results of the linear test for trend were significant ($P \leq 0.05$) for all cancer sites.

Obesity and Cancer Mortality

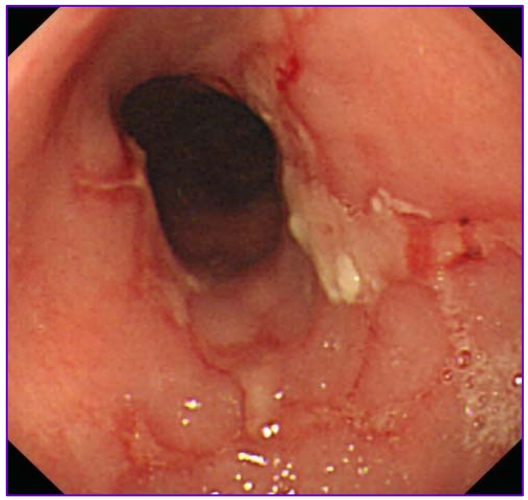


Contribution of Overweight and Obesity to Mortality from Cancer in the United States.

So what?

- Understand the mechanism
- Device method to prevent
- Reduce mortality and improve survival

Positive epidemiological association between obesity and GERD



- 90% ↑ risk of having reflux symptoms
- 80% ↑ risk of having esophagitis
- 180% ↑ risk of having GERD related esophageal cancer

Annals of Internal Medicine 2005

Obesity and Cancer Incidence (MEN)

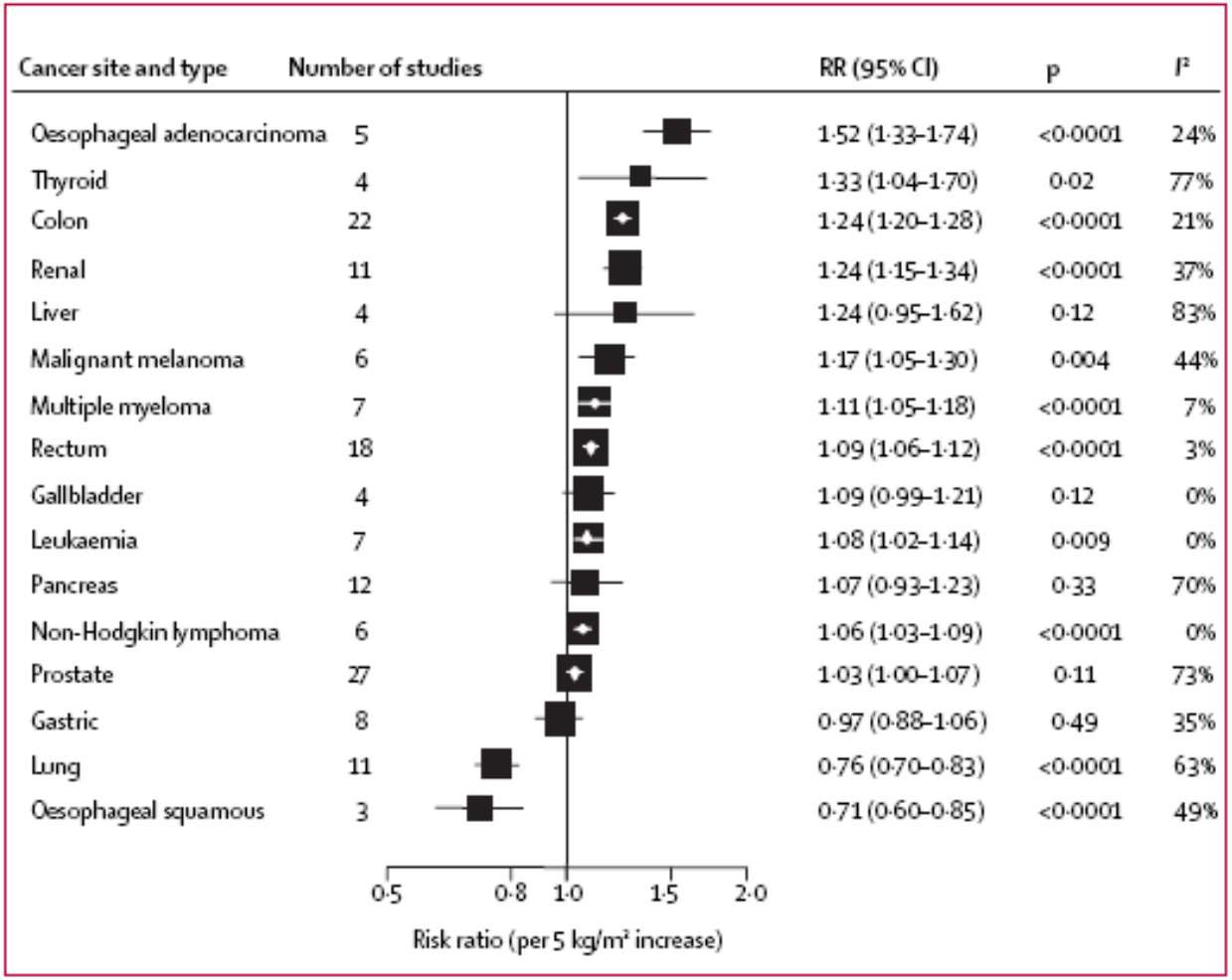


Figure 3: Summary risk estimates by cancer sites in men

Renehen et al. Lancet 2008

Obesity and Cancer Incidence (WOMEN)

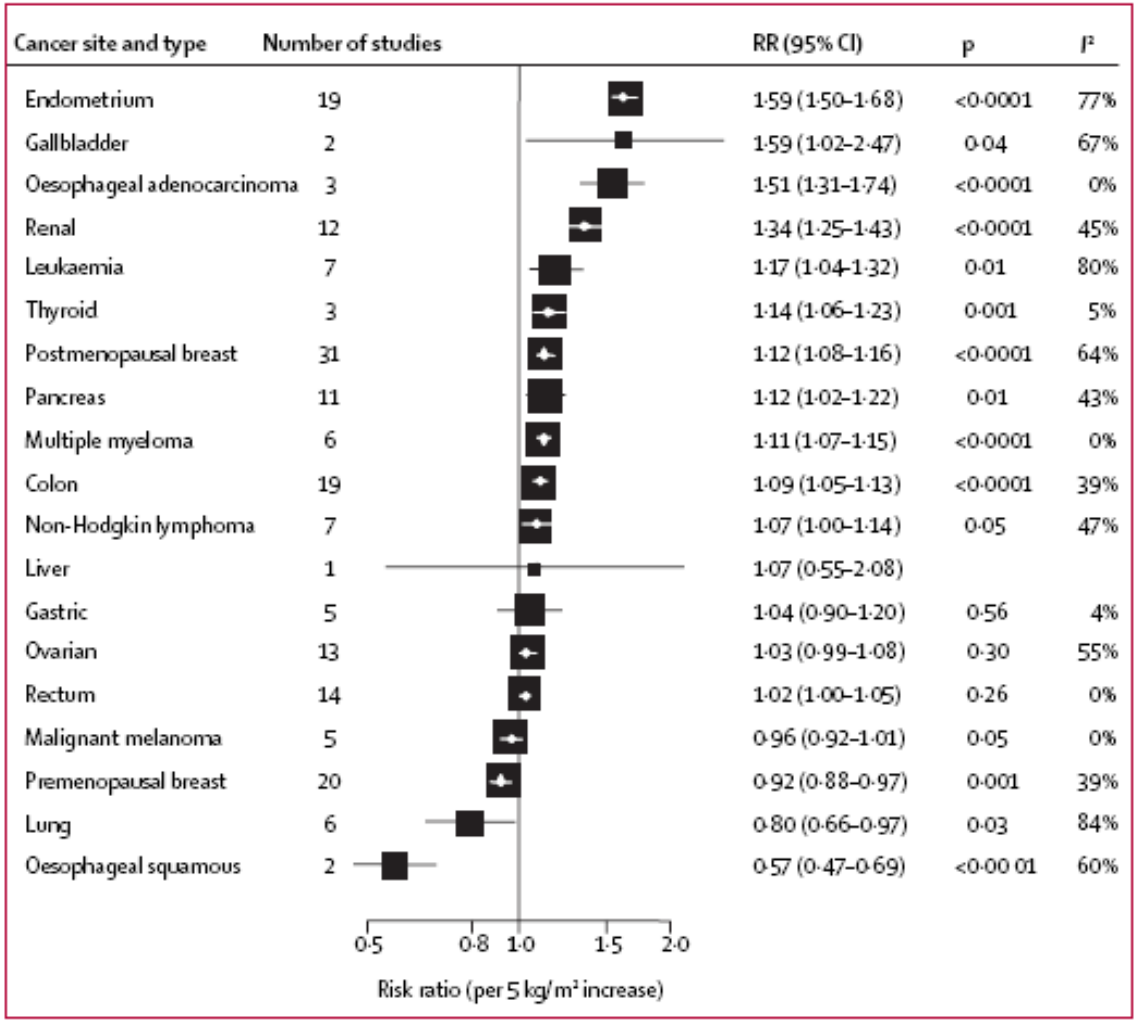
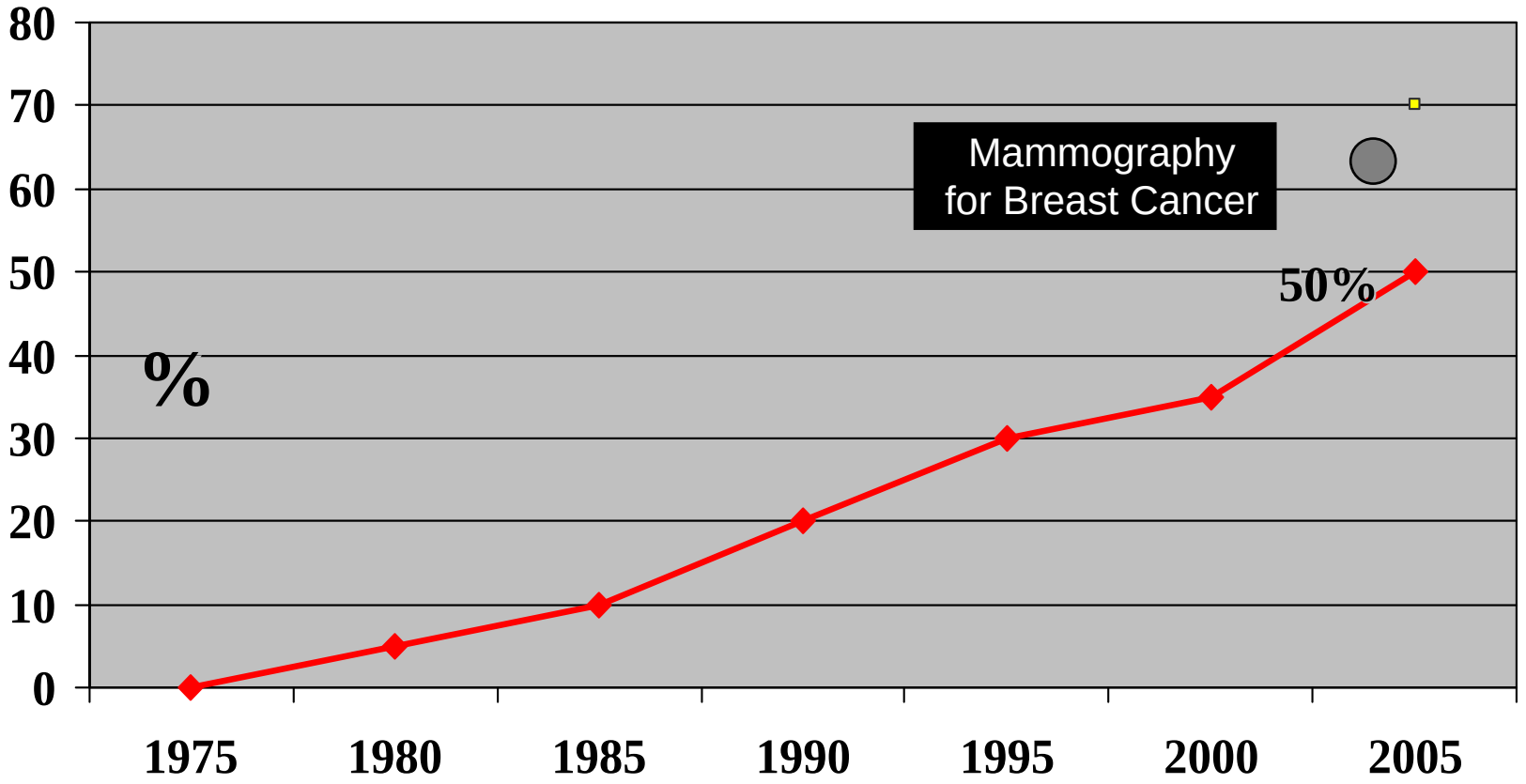


Figure 4: Summary risk estimates by cancer sites in women

Renehen et al. Lancet 2008

Colon Screening in USA:
rate of FOBt, FS and Colonoscopy



Cancer Deaths Decline For Second Straight Year

Fewer Smokers, More Screening Credited

By Rob Stein
Washington Post Staff Writer
Thursday, January 18, 2007; Page A01

The number of Americans who died of cancer has dropped for a second straight year, marking a milestone in the war on the disease, officials said yesterday.

More than 3,000 fewer Americans died from cancer in 2004 than in 2003, according to statistics analyzed by the American Cancer Society, indicating that a much smaller decline in cancer deaths a year earlier probably was not a fluke but instead marked the start of a trend.

"It's very exciting," said Ahmedin Jemal, a cancer epidemiologist who prepared the report. "I think it's a turning point in our efforts to reduce the number of people dying from cancer. It's very good news."

Enlarge This Photo

Marston Linehan, chief of urological oncology at the National Institutes of Health, shows President Bush kidney cancer cells through a microscope. (By Gerald Herbert -- Associated Press)

The trend was driven by drops in deaths from three of the four major forms of cancer -- breast, prostate and colorectal -- and a decline in deaths among men from the fourth, lung cancer. It was caused by a combination of factors, including a decrease in cigarette smoking among men, wider screening for colon, prostate and breast cancer, and better treatments, Jemal and others said.

"There's a lot of good news in this report," said Linda Pickle of the National Cancer Institute. "We hope that it's the beginning of a long-term downward trend and that we've finally turned the corner."

President Bush lauded the news during a visit to the National Institutes of Health in Bethesda. "This drop was the steepest ever recorded," he said. "Progress is being made."

GRAPHIC

A Declining Toll
Cancer death rates overall have dropped every year since 1991. Some components of that drop:

U.S. Cancer Deaths

	Men	Women
2002	288,768	268,503
2004*	286,830	267,058

*Most recent numbers available
SOURCE: American Cancer Society
The Washington Post

WHAT READERS ARE SAYING

Your Comments On...

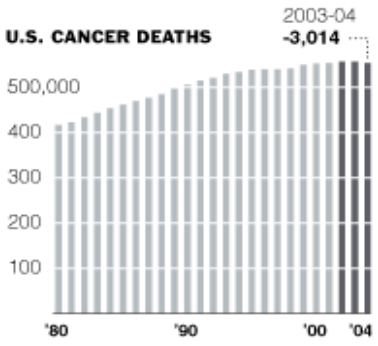
Short Mental Workouts May Slow Decline of Aging Minds, Study Finds

"It would be interesting to know if factors such as stress, or sleep disorders etc. were taken into account. They can be quite memory inhibiting and are more likely to be present in the control group, as a lack of mental stimulation can increase self doubt, decrease confidence and cause a form of panic. Could this have put the control group behind, at the same time the motivated groups were leaping ahead and would this not effect the measurement of the outcome? "

Second Drop in Cancer Deaths Could Point to a Trend, Researchers Say

By DENISE GRADY
Published: January 18, 2007

The number of cancer deaths in the United States has dropped for the second year in a row, the American Cancer Society reported yesterday. The finding suggests that the small drop reported last year — the first in more than 70 years — was real, possibly the start of a continuing decrease and not merely a statistical fluke, researchers said.



Source: American Cancer Society

Much of the decrease is due to smoking cessation and improved detection and treatment of colorectal, breast and prostate cancers. But it has taken enormous efforts and ingenuity to produce relatively small gains.

From 2003 to 2004, cancer deaths fell by

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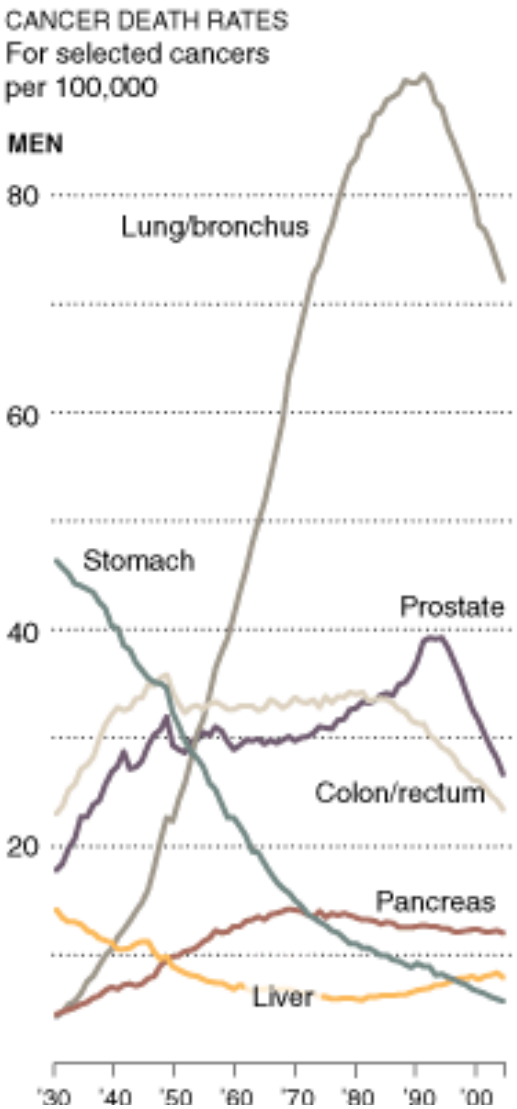
Fewer Deaths

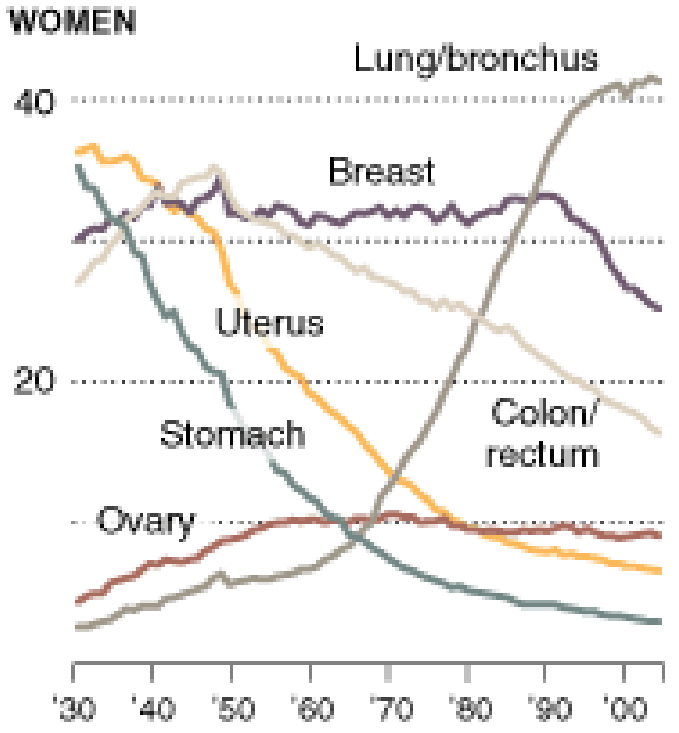
Declines in deaths from colon and breast cancers in women and lung and prostate cancers in men are responsible for a recent drop in cancer deaths.



year's decline, 369. (These are the latest years for which figures are available.) Although the drop is notable, it still pales in comparison with the number of cancer deaths, 553,888 in 2004. Cancer is the second leading cause of death in the United States, after heart disease.

By far the greatest decrea
been in colorectal cancer
in men, 1,094 fewer in w

Dr. Elizabeth Ward, a ma
epidemiology and surveil
society, said the most im
decrease was screening f
which can detect the dise
most treatable, or even p
finding precancerous pol



Source: American Cancer Society

The New York Times


Rupert Lec
Sydney

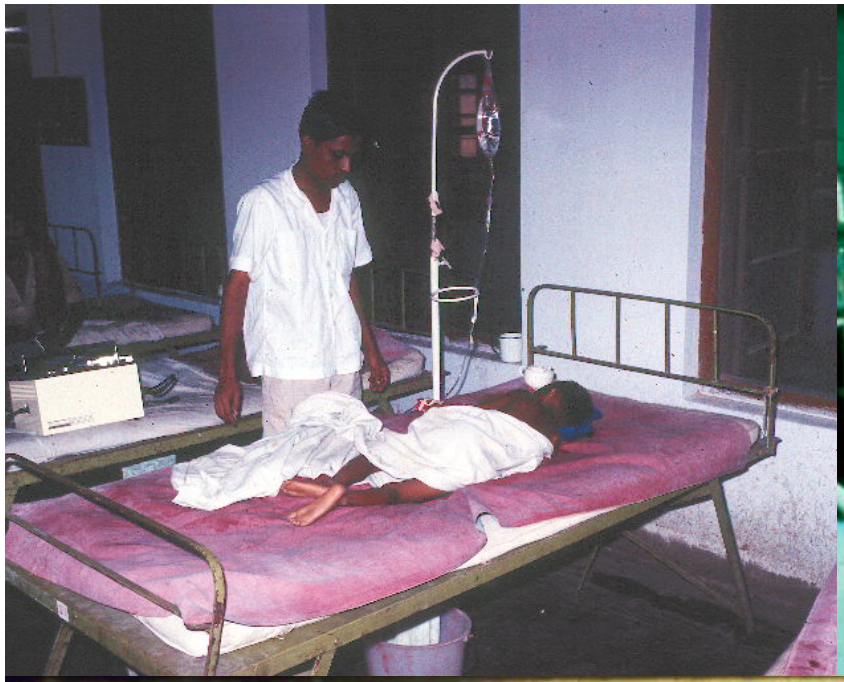
Asia Pacific Consensus Meeting on Colorectal Cancer Screening
亞太地區大腸癌篩查共識會議

Consensus Statements
聲明共識

AP Working Group on Colorectal Cancer. Gut 2008

What is Public Health?

- Observation… Epidemiology
- Analysis… Risk assessment
- Intervention… Prevention




UNOSAL
JEEVAN JAL

HIV AIDS

Earthquake

Tsunami

Saving Life…

By MILLIONS