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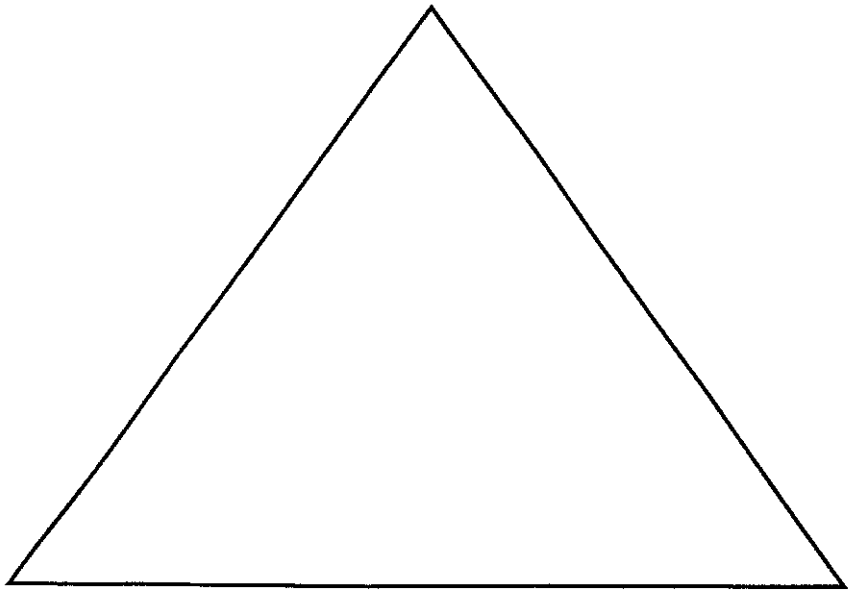
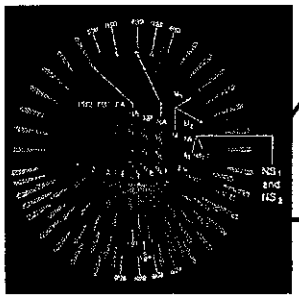
Presentation materials provided by the
Department of Community Medicine
Faculty of Medicine
The University of Hong Kong

The Public Health Approach



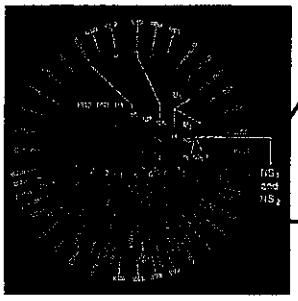
The Public Health Approach

Agent



The Public Health Approach

Agent

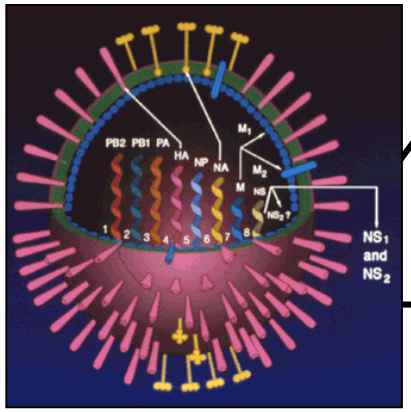


Vector

The Public Health Approach

Host

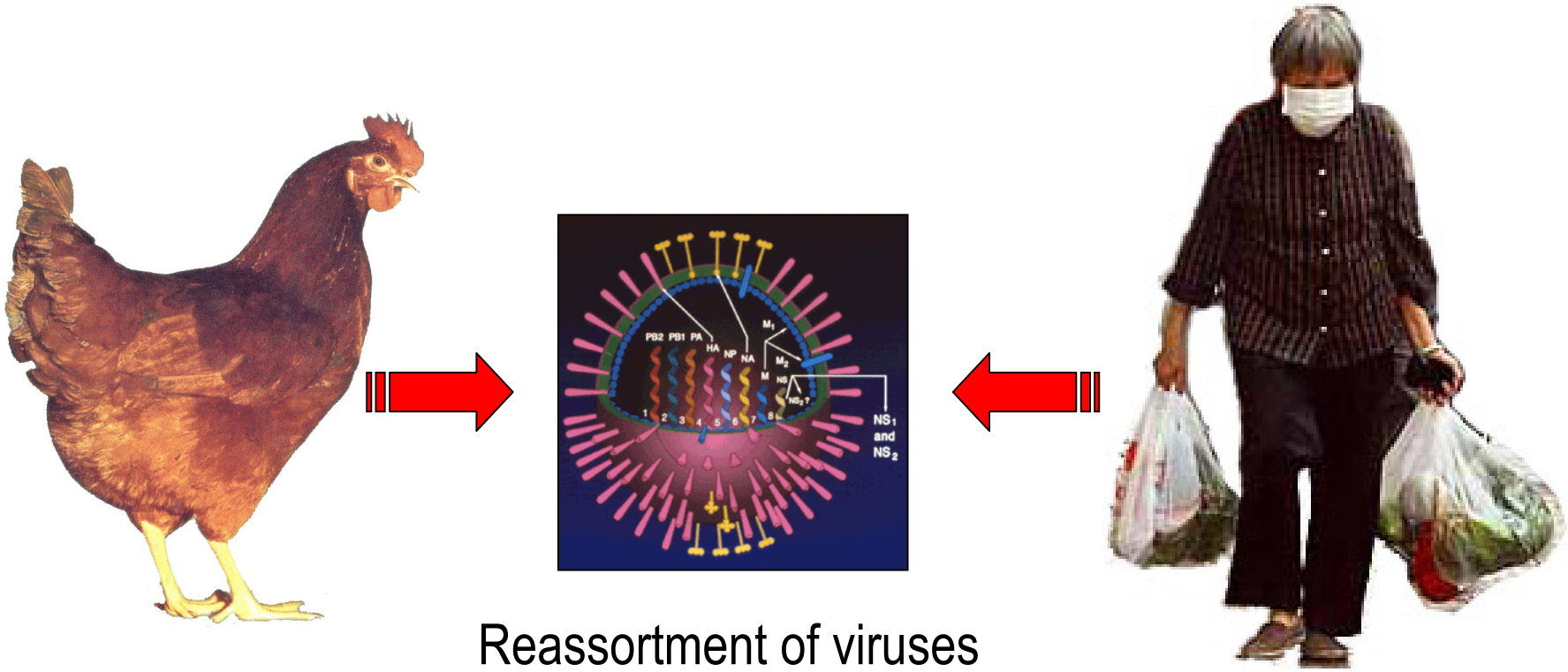
Agent



Human / Avian Influenza

Vector

Avian and human influenza: What is the hazard to the community?



Reassortment of viruses

Mixing of avian and human influenza viruses with exchange of genetic material carries the risk of evolution of a highly pathogenic influenza virus

What is the *risk* of an epidemic with a new highly pathogenic influenza virus?

1. How many contacts with live chickens per year?

18.12 Average no. of live chickens purchased per household

×

2.05M No. of households in Hong Kong

×

9.36% Proportion who touch chickens before buying

= 3.48M person-chicken contacts per year

2. **How many potential human ‘flu cases are among those who buy live chickens?**

   - We have 2 ‘flu seasons of 10 weeks each and about 10% of the population is infected every year
   - Then human ‘flu cases buying chickens who have the potential to be infected by avian ‘flu total

= 134000

3. **What is the best estimate of the chance of a reassortment?**

   Very conservatively:

   If we assume that only

   * 10% of human ‘flu cases buy birds when they are ill
   * 5% of birds carry avian ‘flu virus at purchase
   * 1% of human ‘flu cases co-infected with bird ‘flu

   then the chance of a reassortment is about 1 in 100.

3. **What is the best estimate of the chance of a reassortment?**

   Even more conservatively:

   If we assume that only

   * 1% of human ‘flu cases buy birds when they are ill
   * 5% of birds carry avian ‘flu virus at purchase
   * 1% of human ‘flu cases co-infected with bird ‘flu

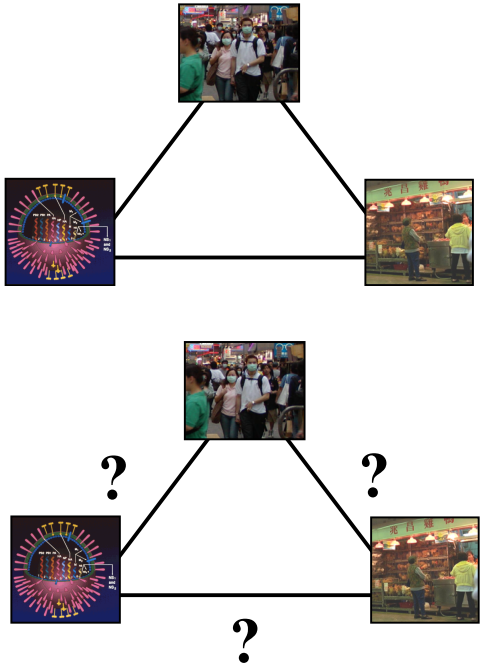
   then the chance of a reassortment is estimated at about 1 in 1,000.

Risk of an epidemic of human transmissible avian influenza from a reassortment of human/avian viruses

Potential human flu contacts with birds	'Flu cases who buy birds	Prevalence of bird 'flu virus	% of human cases who co-infect	Probability of a reassorted virus*
134,000	(10%) 13,400	(10%) 1,340	(50%) 670	55% 1 in 2
			(5%) 67	8% 1 in 13
			(1%) 13	2% 1 in 50
		(5%) 670	(50%) 335	33% 1 in 3
			(5%) 34	4% 1 in 25
			(1%) 7	1% 1 in 100
	(1%) 1,340	(10%) 134	(50%) 67	8% 1 in 13
			(5%) 7	1% 1 in 100
			(1%) 1	0.2% 1 in 500
		(5%) 67	(50%) 34	4% 1 in 25
			(5%) 3	0.4% 1 in 250
			(1%) 1	0.1% 1 in 1,000

** Ferguson et al. Science 2004*

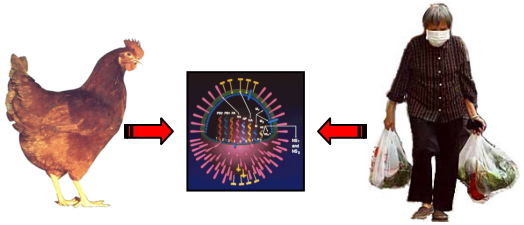
Conclusions and recommendations



General issues

- The precautionary principle in a public health approach based on the *agent*, *vector* and *host* triangle must be paramount
- The most important task is to manage competently the many uncertainties on the arms of the triangle because the potential risks are very high
- From this it follows that in practical terms the public health approach must be to achieve the maximum possible separation between people and live birds

Risk estimates



- Our very conservative estimates of risk to human health are based on the size of the potential hazard for co-infection at retail and market levels

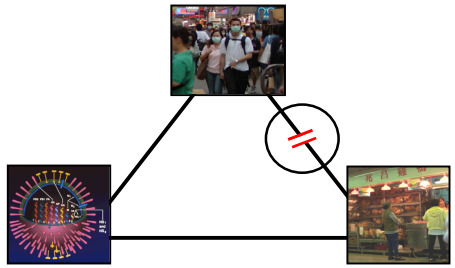
Risk ?

- How do these everyday risk estimates, compare with other *occupational* and *risky activity* probabilities of death?

How does the risk compare with lifestyle and environment?

		Odds of dying in a year
1.	Frequent flyer	1 in 33,000
2.	Airline pilot	1 in 10,000
3.	US Construction	1 in 7,000
4.	US Fire fighters	1 in 2,500
5.	HK Injury & poisoning	1 in 3,500
6.	HK Stroke	1 in 1,900
7.	HK Heart disease	1 in 1,250
8.	HK Air pollution	1 in 1,700
9.	HK Smoking	1 in 1,133
10.	**HK Live chicken sales in wet markets → genetic reassortment**	**1 in 1,000**

The Government proposals



Option A: *Central slaughtering* provides the best opportunity to interrupt the right arm of the AVH triangle and provide a *practical* and *acceptable* approach to health protection

* *We give very strong support to Option A*
* *The public already give 41% support*

Option B: *Regional slaughtering* may be as effective in reducing the hazard by avoiding amplification of viruses and exposure to them. However the greater geographic dispersion of birds and potential exposures creates greater uncertainty

* *We give strong but qualified support to Option B*
* *The public already give 66% support*