

# Pandemic Preparedness: Public Health Laboratory Response

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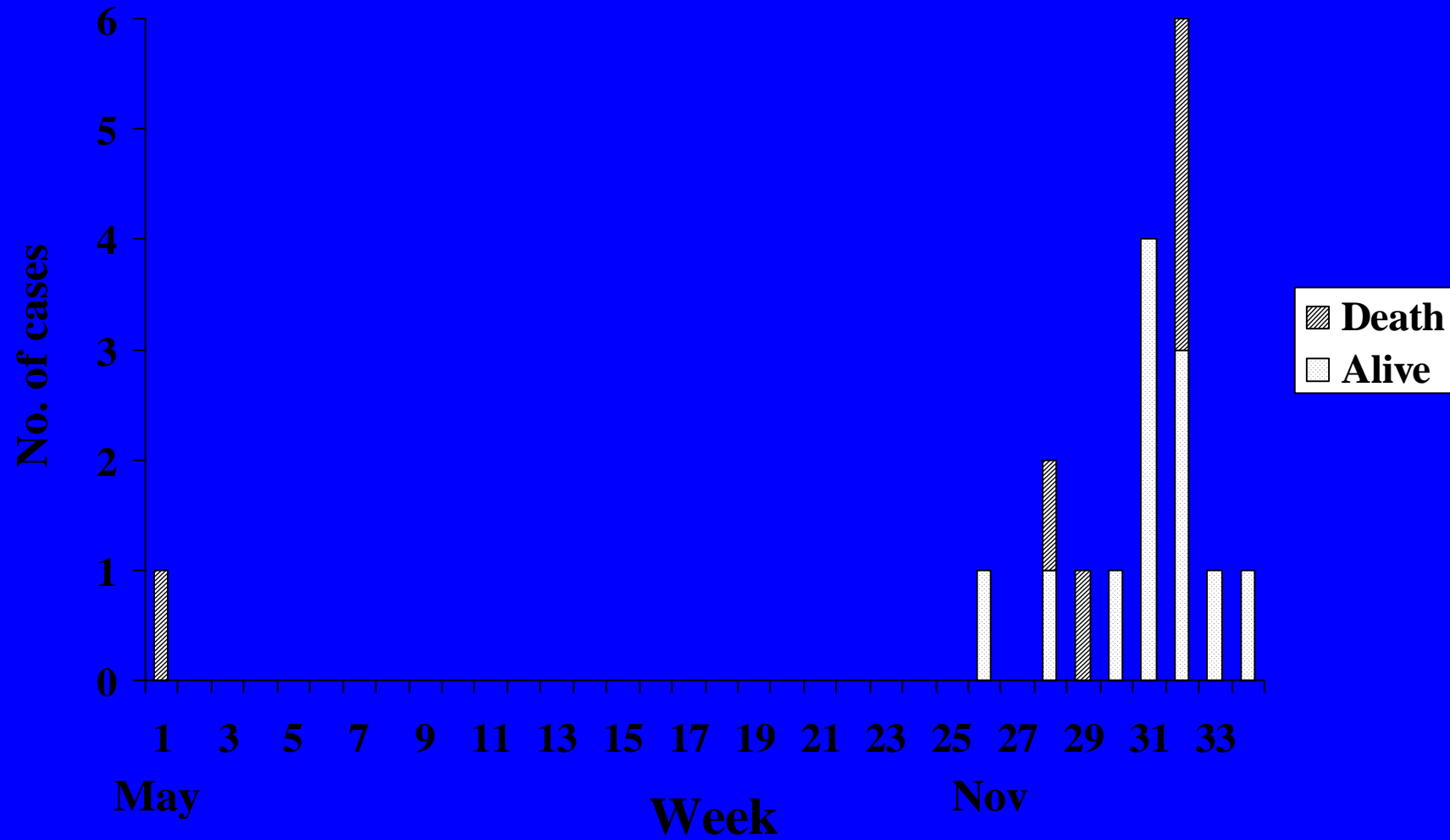
# Role of Public Health Laboratory

- Diagnosis
- Surveillance
- Outbreak investigation
- Quality assurance
- Communication
- Laboratory network
- Research

# Surge Capacity

The ability to rapidly expand beyond normal services to meet the increased demand in the event of large scale public health emergencies or disasters

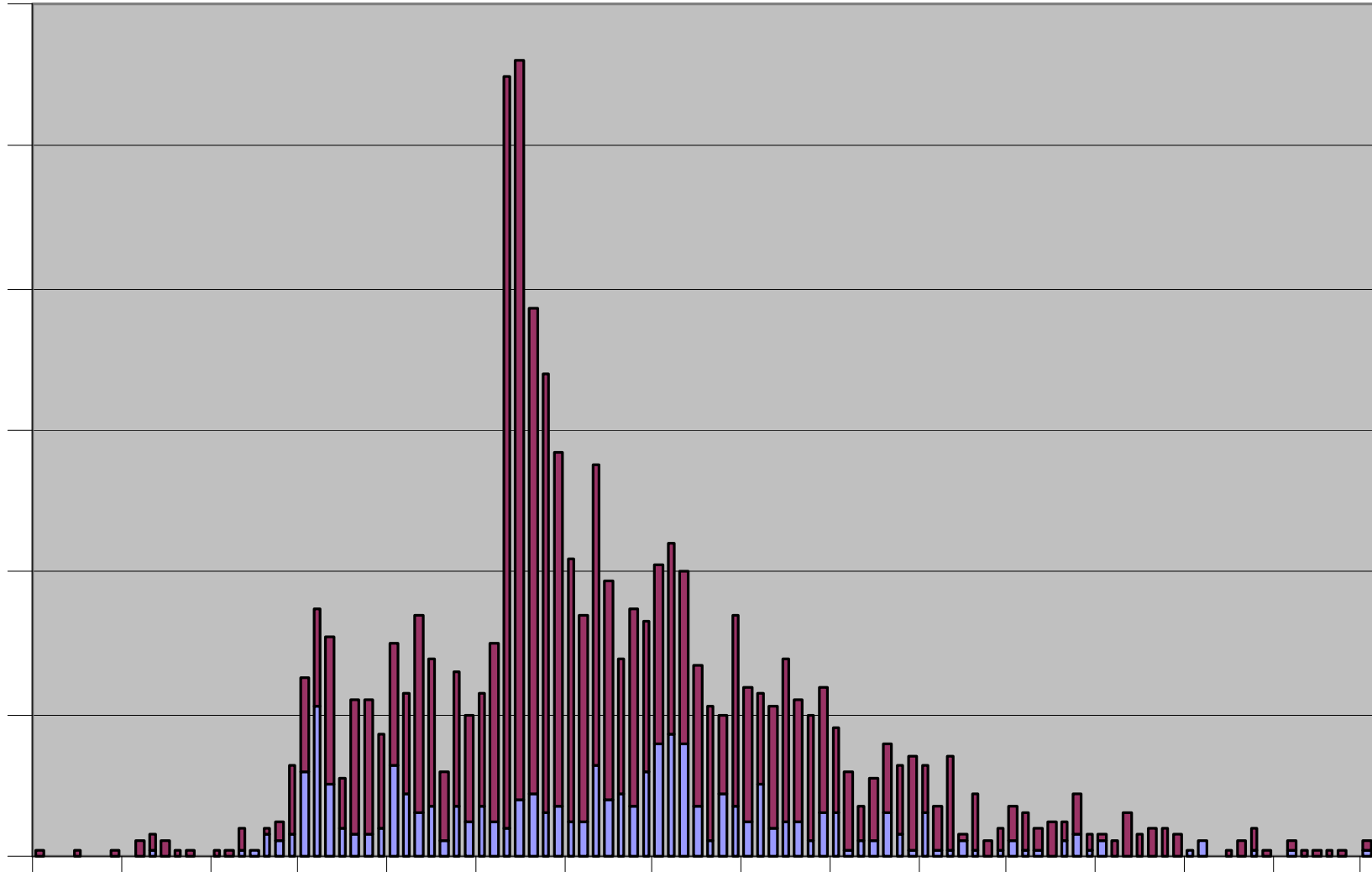
# Epidemic Curve of Influenza A (H5N1) Cases in HKSAR 1997



## Number of Specimens for Virus Isolation (PHLC)

	<u>1997</u>	<u>1998</u>
Jan	532	2243
Feb	547	2362
Mar	552	3162
Apr	618	1648
May	609	1434
Jun	612	1778
Jul	669	1958
Aug	506	1399
Sep	514	1457
Oct	456	944
Nov	482	951
Dec	2224	998

120  
100  
80  
60  
40  
20  
0



15-02-03  
22-02-03  
01-03-03  
08-03-03  
15-03-03  
22-03-03  
29-03-03  
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12-04-03  
19-04-03  
26-04-03  
03-05-03  
10-05-03  
17-05-03  
24-05-03  
31-05-03

## Number of Specimens for Virus Isolation(PHLC)

	<u>2002</u>	<u>2003</u>
JAN	1092	1166
Feb	1195	1530
Mar	1072	5432
Apr	1400	3758
May	1262	1495
Jun	1057	974
Jul	1116	776
Aug	835	665
Sep	757	1283
Oct	791	1193
Nov	866	1008
Dec	880	1407

# Challenges

- Workload
  - Large increase of specimens over short period of time
- Manpower
  - Highly trained staff with special skills required to work long hours
  - Deployment of staff from other virology/pathology labs
  - Recruitment of junior technicians and workmen to assist in simple lab work
- Safety – BSL3 lab required
- Space – inadequate; utilization of other labs
- Equipment – insufficient; back-up/spare capacity required
- Reagents – insufficient stockpile
- Data management – interface with partners
- Specimen management
- Transfer of specimens
- Communication – local and international

# Coordination within Hong Kong

- Discussed among testing labs and reached agreement as far as possible on testing arrangement amongst laboratories
- Enabled contingency planning on operating procedures including stockpiling of reagents and rapid electronic transfer of test results
- Assess technical capacity of diagnostic labs
- Technology transfer
- Recruitment of other diagnostic labs for initial testing
  - First tier: PHLC and University labs
  - Second tier: Hospital diagnostic labs

## Set Protocols

- All testing labs agreed on protocol for PCR, testing strategy, interpretation, turn-around-time as well as quality and biosafety issues
- PHLC to evaluate and optimize testing methods
- Positive test results in other testing labs to be confirmed at PHLC
- Positive results at PHLC as primary screening site to be confirmed at university labs
- Testing results to be shared with partners

# Quality Assurance Programme

- PHLC as reference centre to organize external quality assessment programme
- Simulated specimens dispatched to other testing labs at three month interval
- PHLC to prepare positive control and standard samples for regular validation of test performance

# Referral Centre

- All test requests from labs that do not have the testing capacity should be referred to PHLC
- PHLC to provide free consultation and testing service
- To avoid inappropriate use of resource and minimize false positive testing results, all request should be accompanied by patients' clinical and laboratory information

## Issues Requiring Consensus

- Sharing of clinical samples and agents
- Fast tracking the issuance of import/export permit of "strategic commodity"
- Safe transport
- Transportation cost
- Material transfer agreement

# Laboratory Safety and Security

- Training of personnel
- Appropriate containment facility
- Current guidelines on safety precautions including management of accidents and medical surveillance
- Safety audits
- Facilities for maintaining clinical specimens and aetiologic agents

# Specimen Management

Large number of various specimen to be aliquoted,  
labelled and stored

Storage at appropriate safety level

Maintain current records

- Source and date of collection

- Nature of material

- Number of vials

- Position in freezer

- Genomic sequence of isolate if available

Transfer of specimens to other labs for further  
characterization, diagnostics/vaccine development

Maintain records of material transfer

# **Influenza Pandemic - Hong Kong Government**

## **Response System**

- **Alert response level**
  - **H5N1 outside Hong Kong**
  - **H5N1 in Hong Kong in imported birds, wild birds**
  - **Human H5N1 outside Hong Kong**
- **Serious response level**
  - **H5N1 in Hong Kong**
  - **Human H5N1 in Hong Kong without evidence of human-to-human transmission**
- **Emergency response level**
  - **Efficient human-to-human transmission in or outside Hong Kong**
  - **Pandemic influenza**

# **Role of Public Health Laboratory during influenza pandemic**

- All specimens from suspected cases would be forwarded to public health laboratory or university labs for rapid detection, virus isolation and characterization during Alert response level**
- Transfer of technology to three labs assessed to have capacity to take up more tests**
- Confirmation of all positive cases**
- Perform specific serology on close contacts**
- Perform antiviral resistance testing**
- Coordinate with universities to perform gene sequencing**
- Send isolates to WHOCC and discuss on diagnostics and vaccine development**
- Vaccine efficacy study if vaccine available**

# Lessons Learned

- Preparedness plan
- Continuous personnel training
- Quality assurance
- Lab safety and security
- Enhancing information system
- Consensus on testing arrangements
- Recruitment of labs assessed to have the capacity
- Network with local and international partners

*Thank You*