The Federation's Annual Scientific Meeting 2003

"SARS: Reflection and the Way Forward"

Organized by the Federation of Medical Societies of Hong Kong

Severe Acute Respiratory Syndrome: Response from Hong Kong

Dr. E. K. YEOH
Secretary for Health, Welfare and Food, HKSAR

SARS Disease Burden in Hong Kong (as at 20 June 2003)

Total confirmed cases	1755
• Recovered & discharged	1403 (79.9%)
• Died	296 (16.9%)
• In convalescence facilities	22 (1.3%)
• In non-ICU setting	22 (1.3%)
• In ICU setting	12 (0.7%)

Government's Strategies

4 prolonged strategy centred on:-

- Early detection
- Swift contact tracing
- Prompt isolation & quarantine
- Effective containment

Strategies result in:-

- Shortening the interval between onset of symptoms & admission to hospital
- Limiting the infectious period of the SARS cases
- Preventing further spread of the disease

Early Detection

- Key corner stone of infectious disease control
- Leads to prompt treatment & swift contact tracing
- Implementation of a comprehensive public education programme
  - Heighten awareness of SARS symptoms
  - Bring about early presentation of cases

Swift Contact Tracing

Extensive use of modern technology

Occurrence of infection a online web → access to eSARS database → Real time information to MIIDSS → Prompt cases investigation and rapid contact tracing

Major Incident Investigation and Disaster Support System (MIIDSS) of the Hong Kong Police

Functions:

1. Validate addresses
2. Map geographical distribution
3. Reveal potential sources or routes of spread
4. Show connectivity between cases & contacts

Link analysis of:

1. Who - contact person
2. Where - location
3. When - event

Investigation workflow:

- eSARS online (patient data)
- Investigator team (level I)
  "Hot Spot" alert
- Investigator team (level II)
  Linkage of analysis with charts

Prompt Isolation and Quarantine

Close contacts of SARS patients

- Placed under home quarantine & medical surveillance
- Barred from leaving the territory during the 10-day incubation period

Public health nurses monitor the health conditions of contacts to ensure early presentation

Home quarantine statistics as at 20.6.2003

Number of persons served home quarantine notice	1262
Number of persons develop SARS	25

Effective Containment

Multi-disciplinary response teams

- Comprise experts in public health, building management and environment hygiene
- Undertake dual functions:-
  - Investigation
    Building, drainage & other piping systems, lifts & sewerage systems
  - Remedial actions
    Environmental decontamination, pest control

Multi-disciplinary Response Teams

eSARS → MIIDSS

- Investigate
  - patient contacts
  - environment
  - building services structures
- Control actions
  - disinfection, cleansing & pest control
  - structural rectification
  - contact isolation

Protection of Healthcare Workers

Hospital staff

- Trained in infection control before deployment to high risk areas
- Provided with appropriate set of protective gear

Visitors

- Not allowed in SARS wards
- Limited and controlled to non-SARS wards

Health Checks at Border Points

- Set up medical posts at all border points since mid March
- Temperature checks for all departing, arriving & transiting passengers at airport
- Temperature checks extended to all border points by land, rail and sea
- By mid of June, 320 infrared devices will be installed

Concluding Remarks

- Single digit figure since 4 May 2003
- Last SARS case admitted to hospital on 2 June 2003
- 96% of cases can be linked to known source of exposure
- Dedicated healthcare workers have shown world class professionalism and selfless sacrifice
- Unprecedented level of sources and expertise made available by Government to control the outbreak
- Effective control of infectious diseases requires strong international collaborative partnership – Mainland authorities, nearby countries, WHO, other international bodies
- There is a further need to apply lessons learnt to better prepare for future outbreaks:
  - Establish SARS Expert Committee to undertake review of outbreak management to identify lessons to be learnt
  - Highlight areas for system improvement
  - Apply lessons learnt

Community Healing in the SARS Crisis

Dr. Patrick C. P. HO
Secretary for Home Affairs

Crisis Put to Test

- The health care system
- The economy
- The community

Crisis, loss of beloved ones, economic hardship
→ collective depression
→ recovery

Community Healing – Enhancement of Social Coherence

1. Environment hygiene
2. Healthy lifestyles
3. Mutual reassurance
4. Care and love for those in need
5. Cultural values
6. Collective memory
7. Commemorative activities

Negative Elements of Community Healing

1. Crisis
2. Rumour
3. Distortion of truth

Positive Elements of Community Healing

1. Professionalism
2. Evidence-based reasoning
3. Cultural, spiritual foundation
4. Transparency of government
5. Safety net
6. Social network
7. Civil society

Negative Community Reaction to Crisis

1. Panic
2. Mass hysteria
3. Collective depression
4. Social confusion

Positive Community Reaction to Crisis

1. Commiseration
2. Social caring, assistance, charity
3. Social bonding
4. Altruistic offerings
5. Leadership

Failure of Community Healing

1. Divisiveness of society
2. Distrust of authority
3. Disintegration of social structures
4. Dissolution of services

Successful Community Healing

1. More resilient society and people
2. Immunity developed

Immunity

1. Environmental and ambient hygiene
2. Maturation of a civil society

Environmental and Ambient Hygiene

1. Massive cleaning campaigns
2. Clean up hygienic black-spots
3. Estate management upgrade cleaning work
4. Civil responsibility of individual citizen

Maturation of a Civil Society

1. Humanitarian concern
2. Professionalism
3. Donation: money, hygiene materials
4. Care campaigns

Vitality of Hong Kong Civil Society

1. Professionalism
2. Solidarity for humanitarianism
3. Consciousness for public hygiene
4. Rationality in a civilized society
5. High transparency in information

Advisory Committee on the Promotion of the Fighting Spirit against SARS

1. The thanksgiving and commemoration will help us rehabilitate better, once we know what to treasure and how to care
2. Enhance our social coherence and make us more resilient in time of hardship

Conclusion

Crisis → crisis management → minimize damages and confusion → mature civil society, cultural values → community healing → stronger and more resilient society

We Are Thankful

We gather here today not to mourn, nor to give in despair, but to give thanks for what we are.

We are those who rose above challenges and gave up our lives. Dedication and courage are the very foundation of our commitment. For this, *we are thankful*.

We are those who struggled and succumbed to the disease, and who had made the rest of us value life much more than before. For this, *we are thankful*.

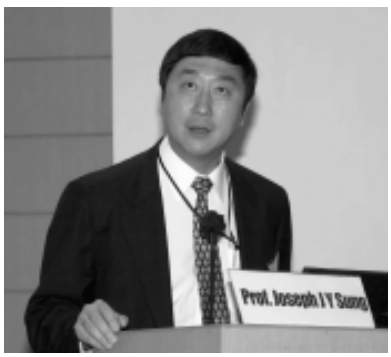
We are those who had endured great pain. The sufferings had driven us to examine the fundamental strengths and values of our community and to re-think the essence of life. For this, *we are thankful*.

We are those who survived and, following a time of trials and tribulations, had come to know one another much better, and had made room for reconciliation. For this, *we are thankful*.

We are those who call Hong Kong our home. Hong Kong is a blessed land and we have emerged ever stronger and ever more caring. We are the sons and daughters of Hong Kong and *we are thankful*.

What We Have Learnt and the Way Forward

Prof. Joseph J. Y. SUNG
Department of Medicine & Therapeutic, The Chinese University of Hong Kong



What We Have Learnt?

1. In the world today, an infectious disease in one country is a threat to all
2. Emerging infection outbreaks often have an "unnecessary" negative economic impact on tourism travel and trade
3. Infectious disease outbreaks reveal weakness in public health care
4. Emerging infectious disease can be contained with high level government intervention
5. Utilization of hospital beds need to be re-considered
6. Clinicians and microbiologists need to work close together
7. Training in infectious disease is inadequate
8. Training in infection control is required

The Way Forward

1. A more precise case-definition is required for long-term surveillance
2. An improved diagnostic test is a top priority
3. SARS surveillance need to be continued for one year
4. Medical education on public health needs to be emphasized
5. Connection with Mainland China, WHO and CDC need to be strengthened
6. Professionalism of health care workers in Hong Kong needs to be upheld

SARS: The Challenge for Dentistry

Prof. Lakshman SAMARANAYAKE
Chair of Oral Microbiology, Associate Dean (Research), Faculty of Dentistry, The University of Hong Kong

Possible Reasons for No Documented Spread of SARS in Dentistry

1. Patients may not visit dentists during the febrile period
2. Universal infection control taken
3. Pure luck (e.g. Macau SAR)

Universal Precautions

- The same infection control procedures are used for all patients
- A shift from selective precautions to universal precautions after HIV/AIDS epidemic
- CDC published first comprehensive dental infection control guidelines in 1986
- New recommendation guidelines issued in 2003

Infection Transmission in Dentistry

- Direct contact with index case with infection
- Air-borne organisms transmitted by aerosols
- Indirect contact from contaminated fomites
- Improper sterilization of instruments

Aerosols-generating Procedures

- Ultrasonic scaling & root surface debridement
- High- & slow- speed drilling with water spray
- Surgical procedures that require bone drilling or may induce splatter

Droplet Transmission – Based Precautions

- Airborne precautions
- Droplet precautions
- Contact precautions

The Basic Protocol

- Personal protection
- Barrier techniques & zoning

- Sterilization & monitoring
- Disinfection
- Sharps injury management
- Waste disposal

Application of Infection Control in Dentistry for SARS Outbreak

- Screening
- Alternative treatment modalities
- Reduction of contaminated aerosol
- Personal protective equipment
- Hand washing
- Engineering control

Screening

- Notice in clinic/hospital
- Verbal questioning
- Questionnaire
- Temperature measurement

Alternative Treatment Modalities

- Hand scaling
- Low-speed drilling without water spray
- Atraumatic restorative treatment (ART) technique

Reduction of Contaminated Aerosol

- Pre-procedural mouthrinse
- Rubber dam isolation – 72% reduction in bacterial aerosols during high-speed instrumentation
- High volume evacuation

Pre-procedural Mouthrinse

0.12-0.2% chlorhexidine gluconate

- 0.2% chlorhexidine gluconate
- 6.65% ethanol
- 0.1% methol

Personal Protective Equipment

- Facemask – one mask per patient
- Goggles/face shield – for any aerosol-or splatter-generating procedures
- Gloves – change between patients and wash hands
- Protective gown – should be appropriate according to level of risk
- Head cap

Factors of Hand Hygiene Compliance

- Skin irritation
- Inaccessible sites/supplies
- Too busy
- Not thinking about it

CDC Hand Hygiene Guidelines

- Use of alcohol-based hand rubs in addition to hand washing
- Hand rubs should be used before and after each patient just as gloves should be changed before and after each patient

Which Hand Rub?

- Isopropyl alcohol
- Isopropyl alcohol + Chlorhexidine gluconate
- Hibisol

Additional Precautions

- Aerosol-generating procedures without rubber dam
- Disinfection of surgery with 0.05% NAOCL/70% ethanol for metal surfaces
- Attention to environmental surface not covered with barriers
- Surgery closed for 15 minutes

Dental Management of Infected/exposed Individuals

- Suspected SARS patients with urgent need
- Suspected SARS patients without urgent need
- Patients diagnosed with SARS within 10 days of dental treatment
- Patients in close contact of SARS patients within 10 days
- Convalescent/recovered patients
- Dental personnel following unprotected exposure to SARS

Engineering Controls for Droplet Infection

- Use of local exhaust devices and direction of air flow
- Air filtration

The Future

High standard of infection needed

New consideration of surgery design

- Powerful air cleaning system
- Aerosol removal
- One-way flow of air

Continuing education & training for all dental personnel

Infection control is risk management

- What is the risk level that you can accept?
- Safety margin

Compliance

- How well are you complying with the basic infection control measures?

SARS: Experience of a Frontline Nurse

Ms. Kin-ying TO
Ward Manager, SARS Ward, Tuen Mun Hospital

Background
- Tuen Mun Hospital was designed in mid-70s and opened in 1990
- B5 Ward had to be converted from orthopedic to SARS ward

At the Start
- Staff factor
- Ward setting
- Workflow
- Supplies and consumables
- Support from management

Review of Ward Setting
- Define "Hot", "Warm" and "Cold" Zones
- Design direction of flow
- Environmental improvement

Environmental Improvement
- Avoid overcrowding
- Use of exhaust fan/mobile HEPA filtration unit
- Exhaust hood for high risk patient/procedure
- Reserve area for gown up/gown down
- Shower area after work/immediately after contamination
- Handwashing facilities

Personnel Protective Equipment (PPE)
- Include mask/gown/cap/glove/goggles
- "Barrier Man" +"Airmate" when entering Hot Zone/ when carrying out high risk procedure
- Training and practice is important
- All staffs are equal in using PPE

Procedure Control
- Gown up and gown down
- Exercising cleansing routine
- Clear segregation of Hot/Warm/Cold Zones
- Control movement of contaminated objects
- Appointment of "Safety Controller"

High Risk Procedures
- Intubation
- Handling of excreta
- Feeding of debilitated patients
- Pharyngeal suction
- Endoscopy

Staff Management
- More staff than a usual general ward
- Maintain separate group of "hot" and "warm" nurse in each unit
- Adequate training
- Arrangement of rotational period
- "Ownership" of problem approach
- All ranks and grades are equal in use of PPE

Different Approach to Different Group of Staff
- Doctors – difficult as usual
- Nurses – largest in number
- Health Care Assistant – need more training and coaching
- Allied health – visit different ward in same day
- Contract staff – high turn over rate

Ward Ownership Concept
- Ward Manager should take up the role as "Safety Controller"
- Designated staff to undertake responsibility while Ward Manager is not on duty
- Duty well documented in duty list

Safety Controller
- Responsible for observing the practice of others and provide feedback on infection control
- Responsible for safety of staff, patients and visitors
- Provide adequate PPE and supervising the use of them

The Infection Control Team for SARS in TMH
Headed by the Consultant Microbiologist
4 teams
- Infection Control
- Outbreak Handling
- Data Collection & Processing
- Infection Control Audit Team

Training of Infection Control
Joint effort of
- Hospital Authority Head Office
- Infection Control Team
- Hospital Management

Formats
- Talks
- Demonstration
- VCD/Video

Final Statistics
Period of operation – 13 April to 11 June 2003
Total number of patients: 109
Confirmed SARS: 30
Staff infected in B5: 0

Radiographers' Role in SARS Outbreak

Mr. Apollo Pak-leung WONG
Radiographer I, Department of Radiology, Kwong Wah Hospital

Radiographers are involved in SARS outbreak because chest radiograph and CT thorax are useful tools in the diagnosis and progress monitoring of the disease. Besides, they are amongst the few who come into close contact with SARS patients in all phases of their diseases and it is important that they should be able to practice adequate infection control in order to prevent cross infection in the hospital.

The Story

- Global alert of SARS by WHO on 15 March 2003
- 22 February 2003, index patient admitted into Kwong Wah Hospital
- Index patient warned the staff of the infectivity and severity of the disease
- Infection control measures started to build up in the Radiology Department
- The young radiographer who first came into contact with the index patient was never infected

First Meeting with SHWF on March 25th

March 25th – first meeting with Dr. E. K. Yeoh, Secretary for Health, Welfare and Food for information exchange and recommendations

Memo Issued by Infection Control Leader of KWH

Here we are the Hong Kong frontline professionals fighting this war. We are the frontline soldiers carrying guns & armors fighting the enemy of the century. It is time for us:

- To be united, don't waste time in unlimited fault-hunting debate
- To gather our energy wholeheartedly to fight the killer virus
- To prevent dissemination of the killer virus, by every individual, by every possible means, at our every bit of endeavor
- To reserve our energy to get adequate rest & peace of mind to maintain our health
- To maintain essential patient-medical staff contacts to the minimum
- To pay extra-cautions to high risk procedures

We have to fight for the control of the epidemics. We have to try our best to minimize the morbidity & mortality. We have to try our best to help our expert microbiologists & epidemiologist to gather every useful patient data to work out the epidemiology & microbiology of the killer virus

I do hope that every endeavor we pay today will lessen the pain cast by the killer virus.
Bless you all health care workers.

Second Meeting with SHWF on March 27th

"Please think about what you can do and contribute in this SARS crisis and make suggestions to the Government"

Role of Radiographers in SARS Outbreak

- Issuing of infection control guidelines by the Hong Kong Radiological Technicians' Association
- As radiographic practitioner, voluntary workers, educators, information disseminators and researchers
- Both criticize and support government policies

The Social Impact of SARS: Sustainable Action for the Rejuvenation of Society

Prof. Cecilia L. W. CHAN
Director, Centre on Behavioral Health, The University of Hong Kong

The outbreak of SARS (Severe Acute Respiratory Syndrome) constitutes a new social problem. As well as being an infectious disease, it is also a social affliction that alienates the population, creates isolation, engenders barriers between people, introduces fear to every human encounter, reinforces discrimination and prejudice, removes people's sense of security, and adversely affects community mental health. It has threatened the political, economic, and social stability of Asian cities and has had a negative impact on the rate of economic growth, the health care system, trade, tourism, and employment: more broadly it has also affected people's sense of global harmony and security, Asian pride and virtually every aspect of daily life.

SARS can be turned into a source of positive energy for change, creativity, and innovation. The feelings of shock and loss can become the catalysts for individuals to develop a stronger emotional capacity for change and problem-solving. Those with the ability to reflect on and reconstruct meaning can usually cope more effectively with stress and trauma. These individuals may grow spiritually and be transformed by their experience of trauma or loss.

New Definition of SARS on an individual level: Sacrifice, Appreciation, Reflection, Support

New Definition of SARS on a societal level: Sustainable Actions for Rejuvenation of Society

Table 1. Positive and negative impact of SARS on individuals

Impact of SARS	Negative Impact	Positive consequences
Psychological and emotional	Fear, worry, anxiety and panic Blame, meanness and shame Guilt of infecting others or being a burden Loss of confidence and feeling confused Depression, helplessness and PTSD	Passion for the sick and poor Compassionate loving-kindness Resilience and perseverance Accommodation of differences Increased emotional strength
Social	Mass hysteria and panic Social discrimination against infected persons and their family members Family conflict and disintegration Social alienation and distancing Interruption in work or education	Social cohesion and cooperation Collective problem solving Inclusive actions for the disadvantaged Family cohesion and creativity Willingness to invest in sustainable development
Spiritual	Loss of meaning, feeling hopeless Emptiness and fear of loss Self-pity and Why-Me? Blaming God or evil spirits Denial of self and meaning Superstitious practices leading to alienation of groups and individuals	Appreciation of life and death Re-organization of priorities in life Spiritual reflections, peace of mind Active search for meaning Re-affirmation of value, willingness to forgive and let go Transformation through pain
Physical	Disease, loss of physical strength Discomfort due to severe symptoms and side effects of treatment Disability especially of long-term functions Death	Awareness of importance of personal and public hygiene Rapid technological advancement in treatment and prevention Learning to take care of the body Exercise and physical training

Table 2. Positive and negative impacts of SARS on the economic, societal, environmental, and political systems of Hong Kong

Impact	Negative Impact	Positive consequences
Economic	Loss of income Loss of jobs Recession, especially in the service and air transport industries Loss of confidence in investment Fiscal crisis due to increase public expenditure	Growth in web-based purchasing New development of eco-industry Improved communication through internet confidences Increase in competitiveness due to lowering costs and wage cuts internet business
Societal	Racial and ethnic discrimination Lost of collective identity and cohesion Greater income disparity Growing mistrust among people	Enhanced sense of community Improved crisis management New popular culture and humor Social groups working together
Environmental	Abandoned pets (cats and dogs) on the street Over-packaging of utensils Mass consumption of bleach and disinfectants	Investment in environmental hygiene Public support for improvement in environmental quality Eco-tourism and development of local cultural tours
Political	Hostility towards authority Disintegration of the health care system due to infection of large numbers of medical staffs Mistrust of government Political and social unrest International disputes in trade and travel	International collaboration in the global village Demonstration of the importance of transparency of information and public accountability Enhanced capability of public governance

Pulmonary Rehabilitation for SARS Patients in Wong Tai Sin Hospital

Dr. Ho-pui SO
Chief of Service, Consultant Physician, Department of Rehabilitation and Extended Care, Wong Tai Sin Hospital

Consequences of SARS

1. Lung function impairment: residual damages
2. Muscle dysfunction: peripheral and cardio-respiratory
3. Psychological upset
4. Social loss: jobs, family life, social isolation and discrimination
5. Side effects of medication

Selection Criteria for SARS

1. Breathlessness at rest or with activity
2. Functional limitation with occupational, social and leisure activities and activities of daily living (ADL) (basic or instrumental)
3. Psychological disturbance
4. Impaired oxygenation
5. Impaired performance at exercise testing

SARS Pulmonary Rehabilitation Program

- Four major components:
  - Exercise training
  - Education
  - Psychosocial intervention
  - Outcome assessment
- A multi-disciplinary team
- Patient can also choose to take Chinese Medicine

Exercise & ADL Training

- Skills training
  - Energy conservation
  - Endurance
  - Breathing control in ADLs and exercise
  - Stress management
  - Relaxation technique
- Recreational therapy: taichi, qi-gong
- Home exercise

Education Components

- Understanding SARS and its therapy
- Infection control
- Breathing control and energy conservation
- Stress management
- Healthy life style and nutritional advice
- Community resources

Psychological Intervention

- Counseling
- Stress management/coping skills/crisis intervention
- Provided by medical social workers and clinical psychologists

Outcome Assessment

1. SARS PR Screening (SPRS) Score
2. St. George Respiratory Questionnaire (SGRQ)
3. Exercise tests: 6 minute walk test (6MWT)
4. Handgrip strength testing
5. State-Trait Anxiety Inventory
6. Emotional status and psychosocial needs assessment
7. Oximetry assessment
8. Community integration questionnaire
9. Body mass index/albumin
10. General Health Scale: SF-38
11. Monitored Functional Task Evaluation
12. Hospital Anxiety and Depression Scale (HADS), Impact of Event Scale
13. Chinese Inventory of Wellness (CIW)

WTSH SARS PR Program

Phase I
- Induction

Phase II
- 7 days training
- Phone follow up 2 weeks post discharge
- Ward follow up 4 weeks post discharge

Phase III
- Consolidation

Phase IV
- Maintenance

Demographics

Period
- 16 May-16 June 2003

Number of patients
- Phase I: 46
- Phase II: 31

Age
- Phase I: 52.76 (mean) 21-85 (range)
- Phase II: 41.87 (mean) 18-73 (range)

Results

- Significant improvement achieved
- Each patient was given a certificate on conclusion of the rehabilitation program
- Financial concern was the main residual psycho-social need

Infection Control: Right Focus, Appropriate Practice

Dr. Wing-hong SETO
Department of Microbiology, The University of Hong Kong

1. Back to the basics but not overkill

2. Good planning and decontamination for high risk procedures

3. Evidence base practice and not just official guideline

SARS: Some Perspectives

Prof. Kwok-yung YUEN
Department of Microbiology, The University of Hong Kong

A SARS Viral Particle and Possible Action of Anti-viral Agents (Figure 1)

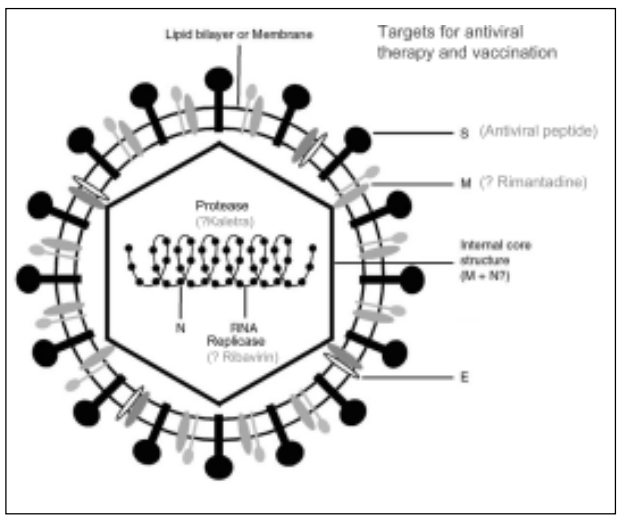


Figure 1

Action of SARS Virus

- The virus "screws" into a human cell and "closes" like an hairpin
- Viral RNA remains in the cell cytoplasm
- Research going on to use a fusion intermediate (e.g. a synthetic peptide developed by Dr. D. Ho and HKU) to stop the "screwing" and "closing up" action of the viral hairpin

Kaletra May Play a Role in SARS Treatment

No firm conclusion yet unless randomized control trial can be performed (Figure 2)

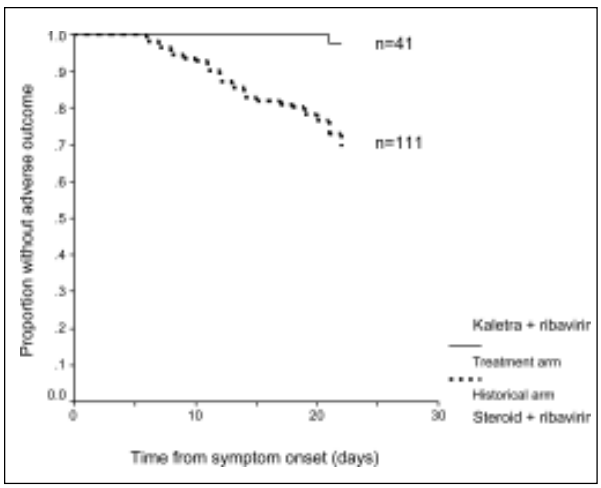


Figure 2

How Early Can Be the Diagnosis? (Figure 3)

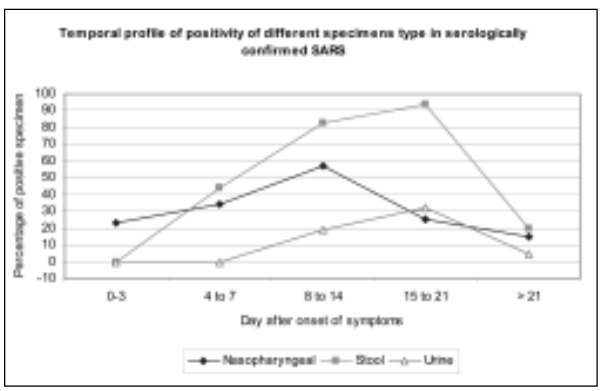


Figure 3

Impact on HK's Economy

- First is the Second World War
- Second is the plague in 1894 which had great similarity with this SARS outbreak

The Future

- Drainage design in buildings may have to be changed e.g. floor drains at Amoy Gardens had caused re-entrant phenomenon and led to a big outbreak
- Improvement needed in diagnostic test, vaccination, hospital isolation technique, environmental hygiene, food hygiene
- Attention has to be paid in control measures
  - Animal-to-human
  - Border control
  - Human-to-human

Strategy of HKU on Emerging Infectious Diseases

1. HKU Pasteur Research Centre and Human Genome Centre
   - Bioinformatics and functional genomics
2. WHO Collaborating Centre Laboratories on surveillance of avian and human influenza
   - Bidding
3. AIDS Research Institute
   - Advanced vaccinology
   - Ativiral screening
4. Other programme on emerging and re-emerging infectious diseases
   - Rapid response team (CDC style?)

Suspension of Joint DCH Examination in September/October 2003

The Hong Kong College of Paediatricians and the Royal College of Paediatrics and Child Health wish to announce the suspension of the Joint DCH Examination in Hong Kong in September/October 2003 due to the recent outbreak of SARS in Hong Kong.

For enquiries, please contact the College Secretariat of the Hong Kong College of Paediatricians at tel. 2871 8871.

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