Standardization versus adaptation for patient safety: a lesson learnt from three scabies outbreaks

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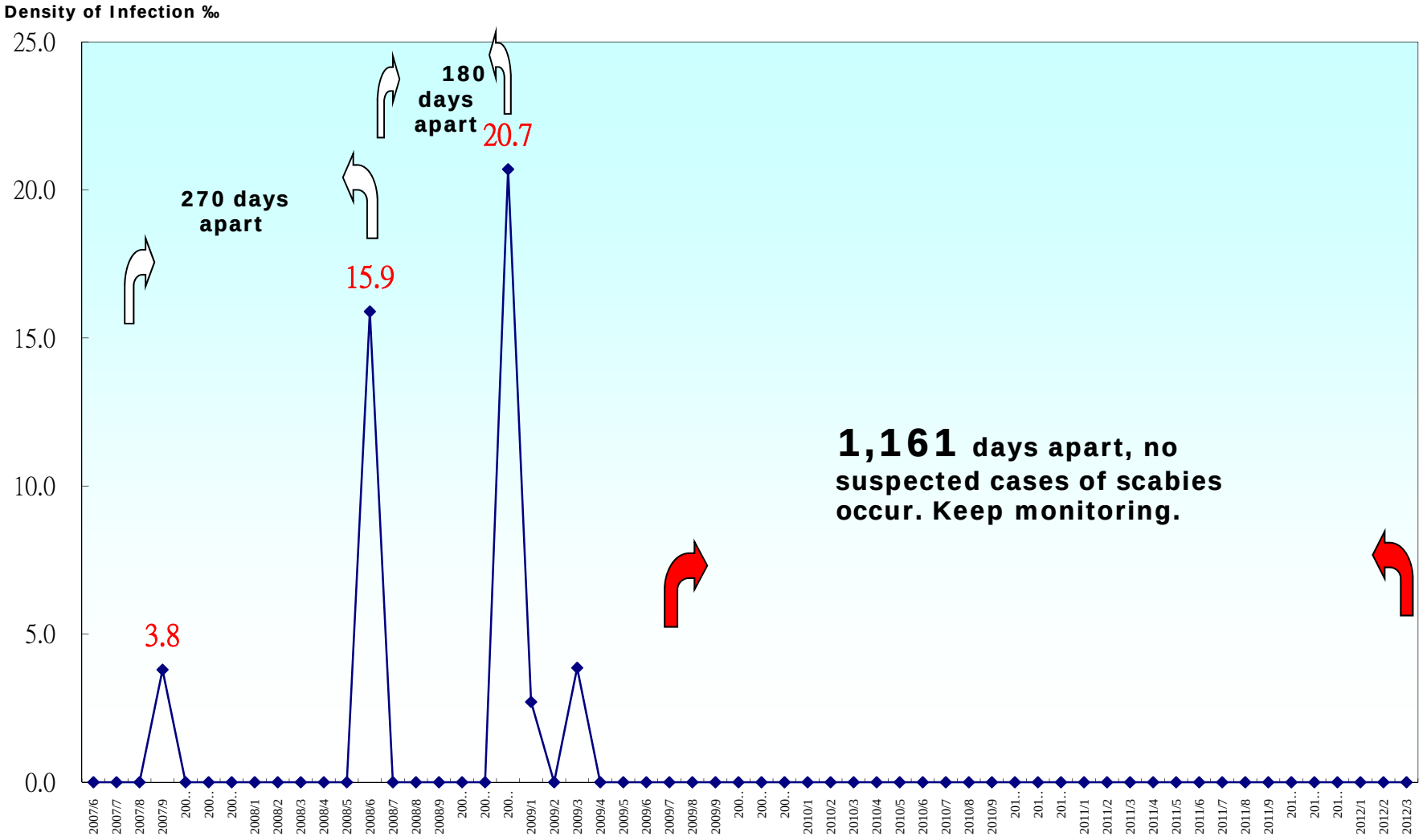
A story of three scabies outbreaks in Respiratory Care Wards (RCW)



2007/ Aug

2008/Nov

May/31/2012

The setting

- A respiratory care wards (RCW) with 60 beds in a Taiwan regional hospital.
- At the third outbreak (2008 – 2009), the occupancy rate was 83.4% per month.
- Total workforce in the RCW consisted of 4 doctors, 18 nurses, 21 personal care assistants, 3 respiratory therapists and one full responsible infection controller.
- All patients were on prolonged mechanical ventilation (PMV), over age 60 and disabled

Context

Disease

- Scabies is not a notifiable disease in Taiwan.
- Institutional scabies outbreaks in health care settings are underreported.
- Scabies outbreaks are common in long-term care and nursing homes around the world.
- Scabies is a significant source of morbidity to residents in nursing homes and among debilitated and immune-compromised patients in hospitals because of its highly contagious nature.

Context

Quality of life

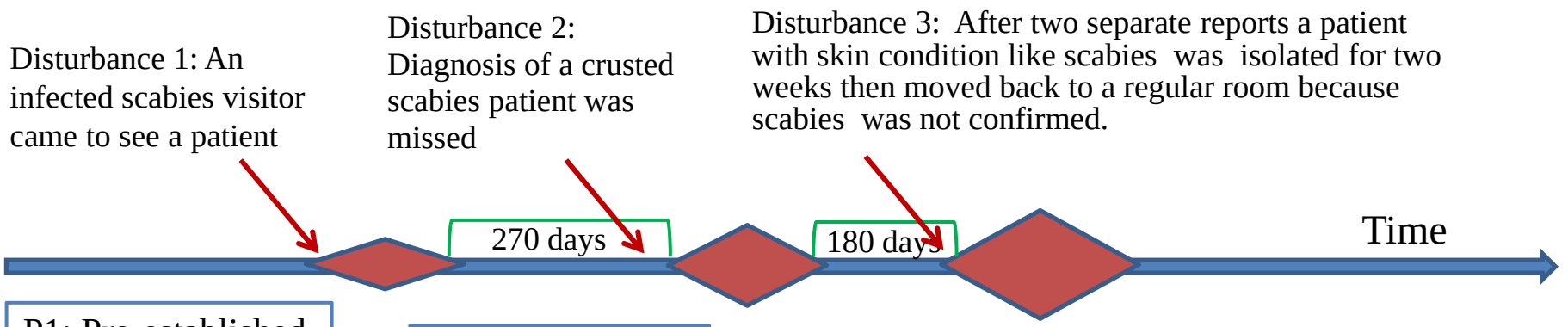
. Scabies is additional suffering for patients on PMV whose quality of life is already very low.

Financial burdens

- Scabies is associated with a considerable working and economic burden including prolongation of hospitalization, ward closures, patient's treatment laundry and environmental disinfection procedures, and extra staffing
- Patients on PMV are increasing in the last ten years in Taiwan.
- Average of health expenditure of patient on PMV has been the highest burden for the National Health Insurance (NHI) system in Taiwan.
- Several revisions of NHI's payment scheme for the patients on PMV were made in order to control the increasing financial burdens.

Story of the three scabies outbreaks

Prevention, Treatment, Investigation



P1: Pre-established prevention activities (A guideline for controlling scabies infection)

P2: P1 plus an amendment in self-declaration of visitors' skin condition

P2

P3: amendment and integration of prevention and treatment for controlling scabies infection and outbreak

T1: Pre-established treatment

T2: T1 plus the required isolation period of 14 days for a suspected patient

T3: T1 plus extending isolation time from14 days to 21 days and then to 2 months

RCA

RCA

RCA

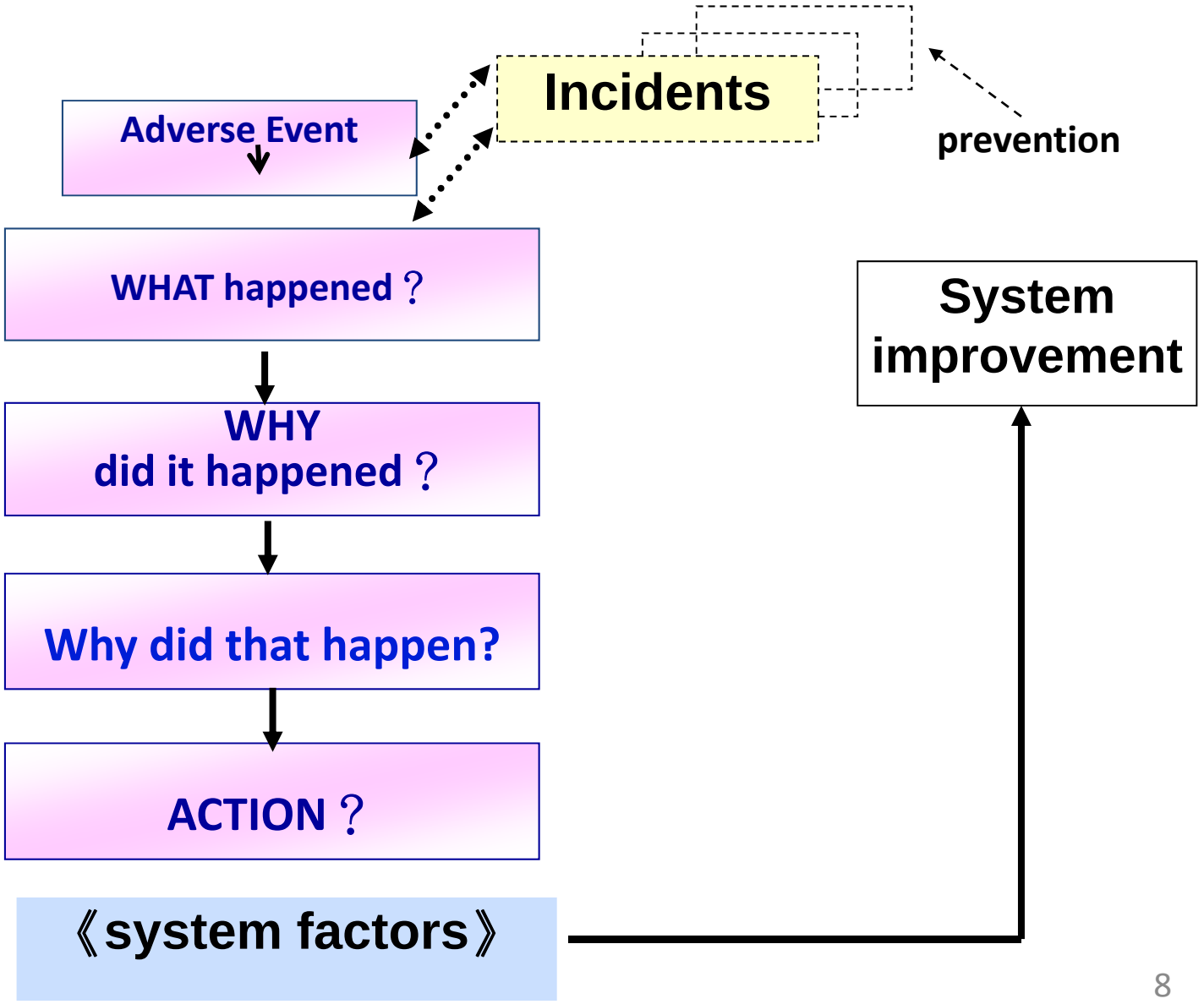
SOEA

Two event investigation methods

- Root Cause Analysis (RCA)

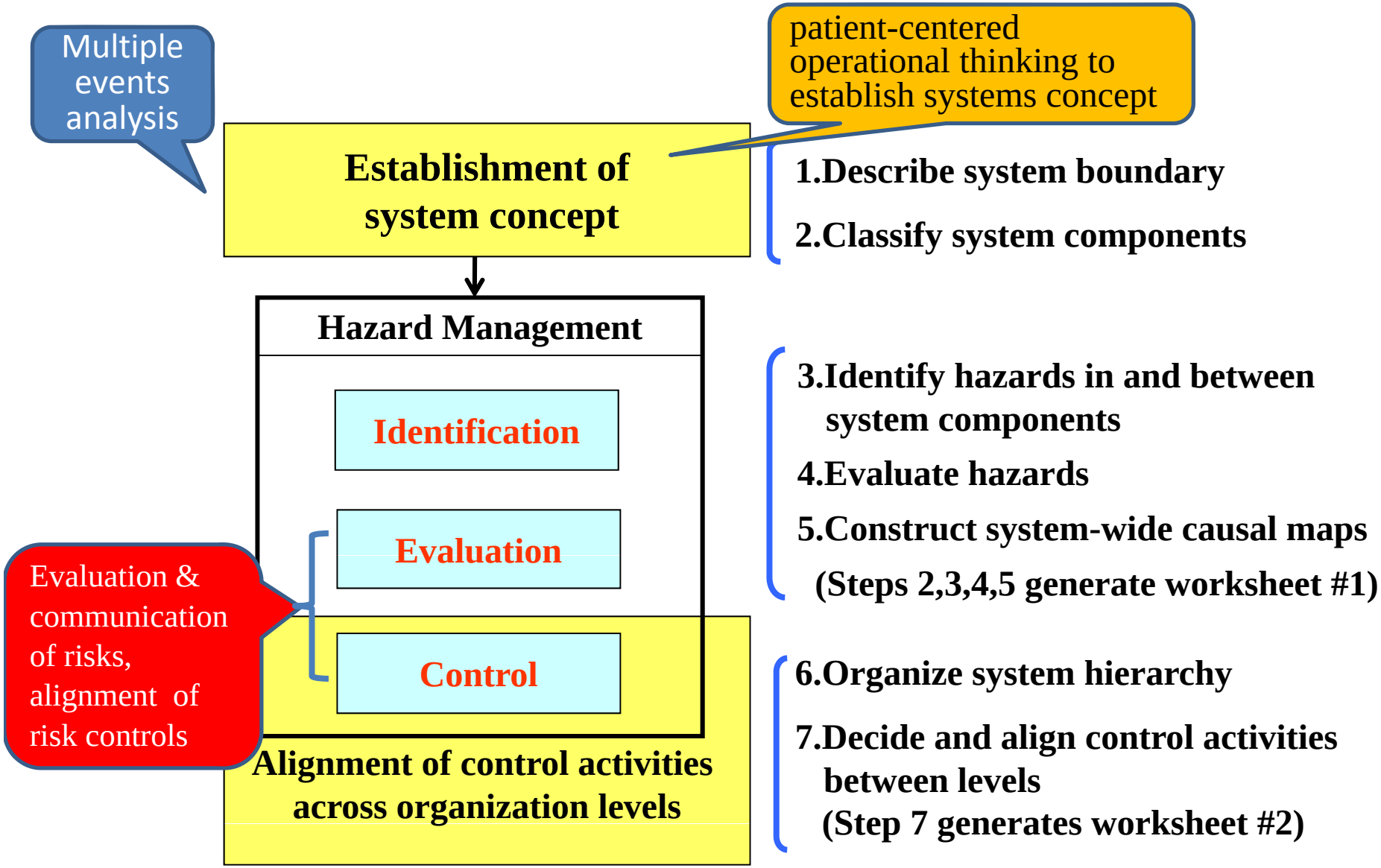
- System Oriented Event Analysis (SOEA)

Root Cause Analysis

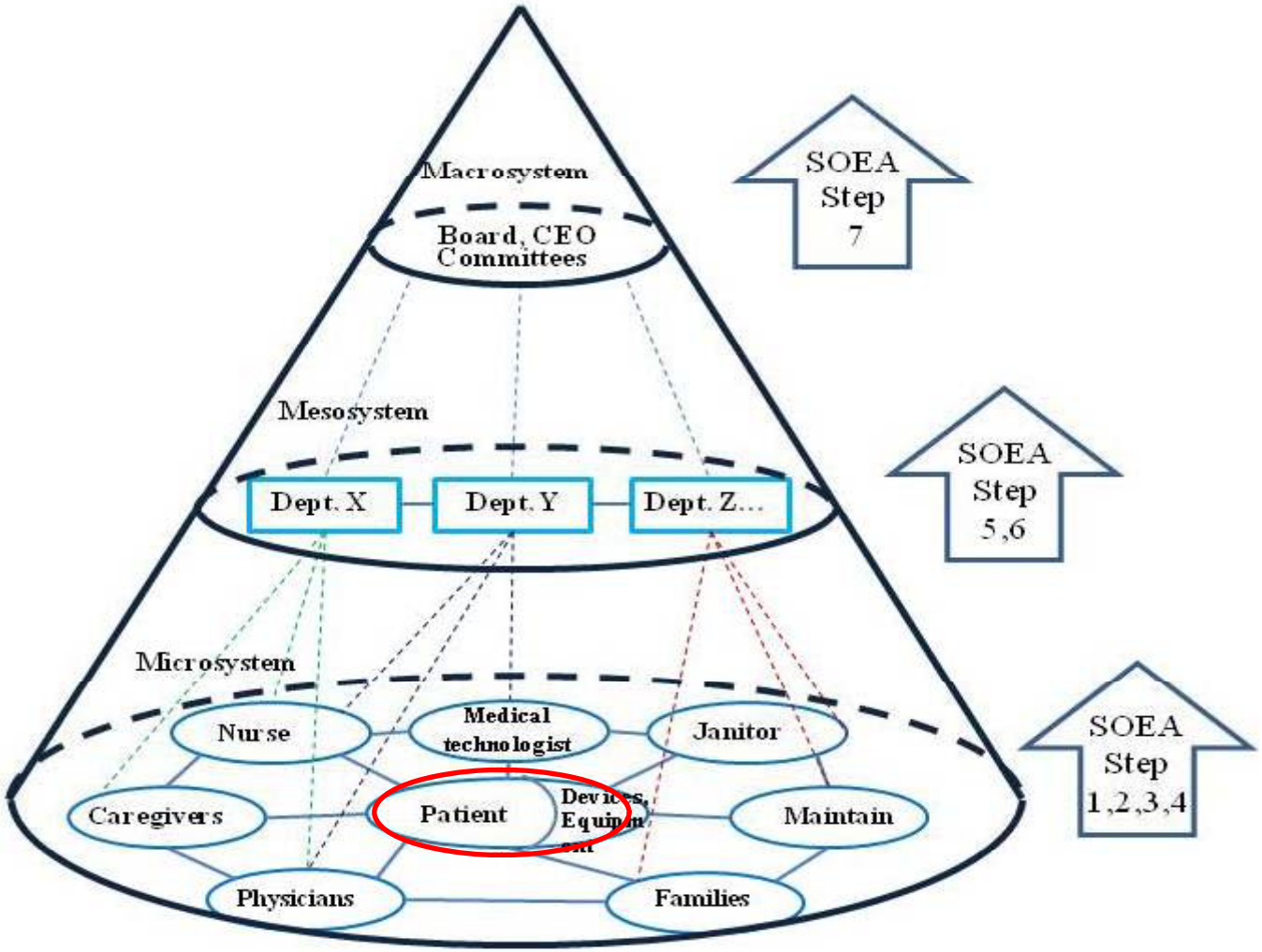


ETTO concern

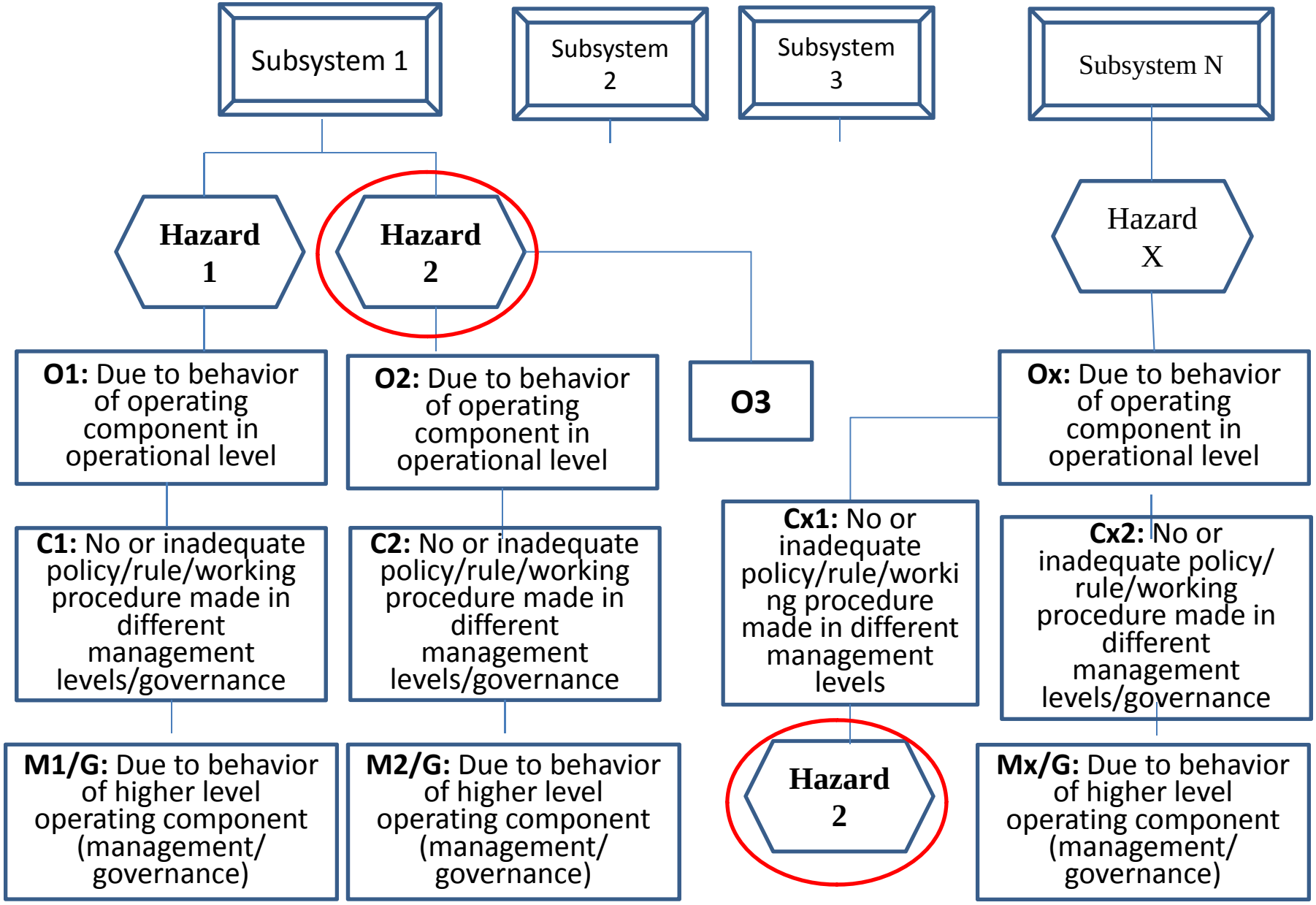
System Oriented Event Analysis model



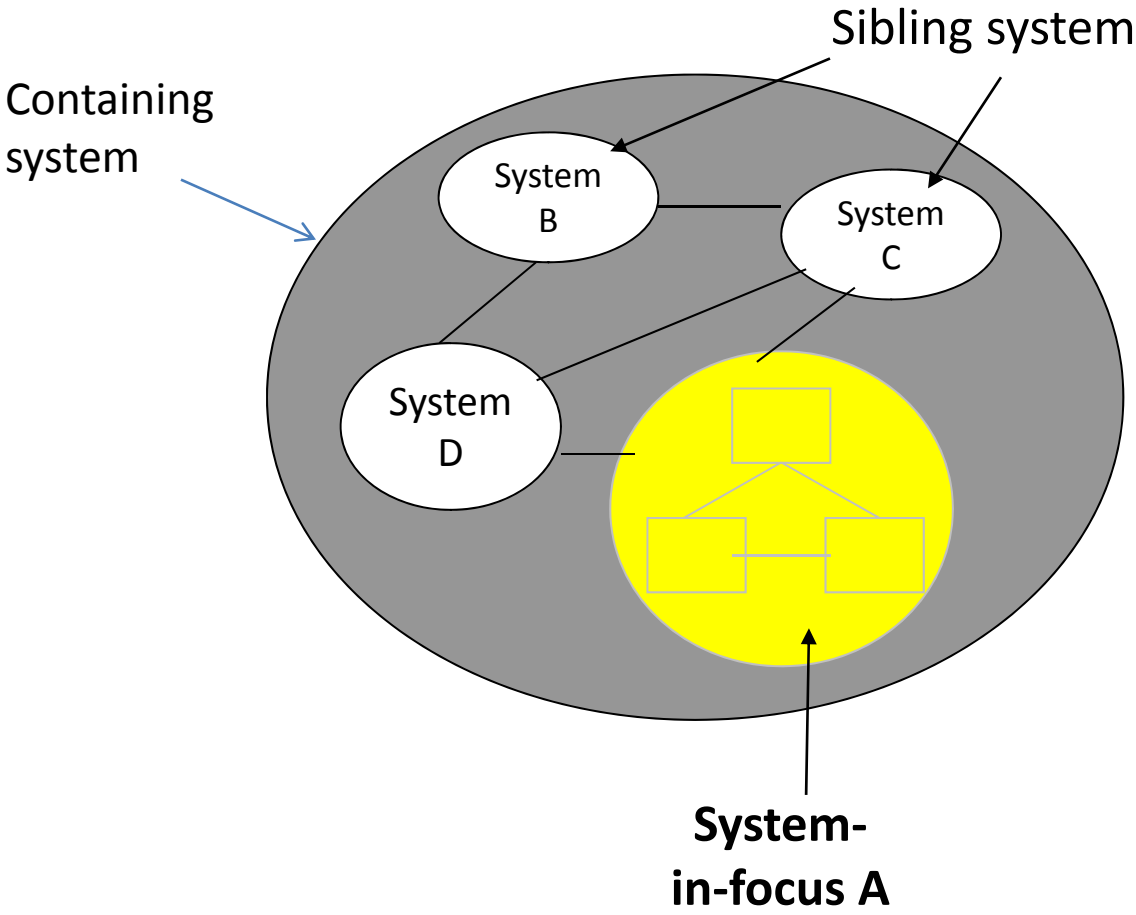
Patient-centered operational thinking to establish a system concept



System-wide causal map to link the interrelations between systems



System hierarchy for synthesis and communication



(Hitchins,1992)

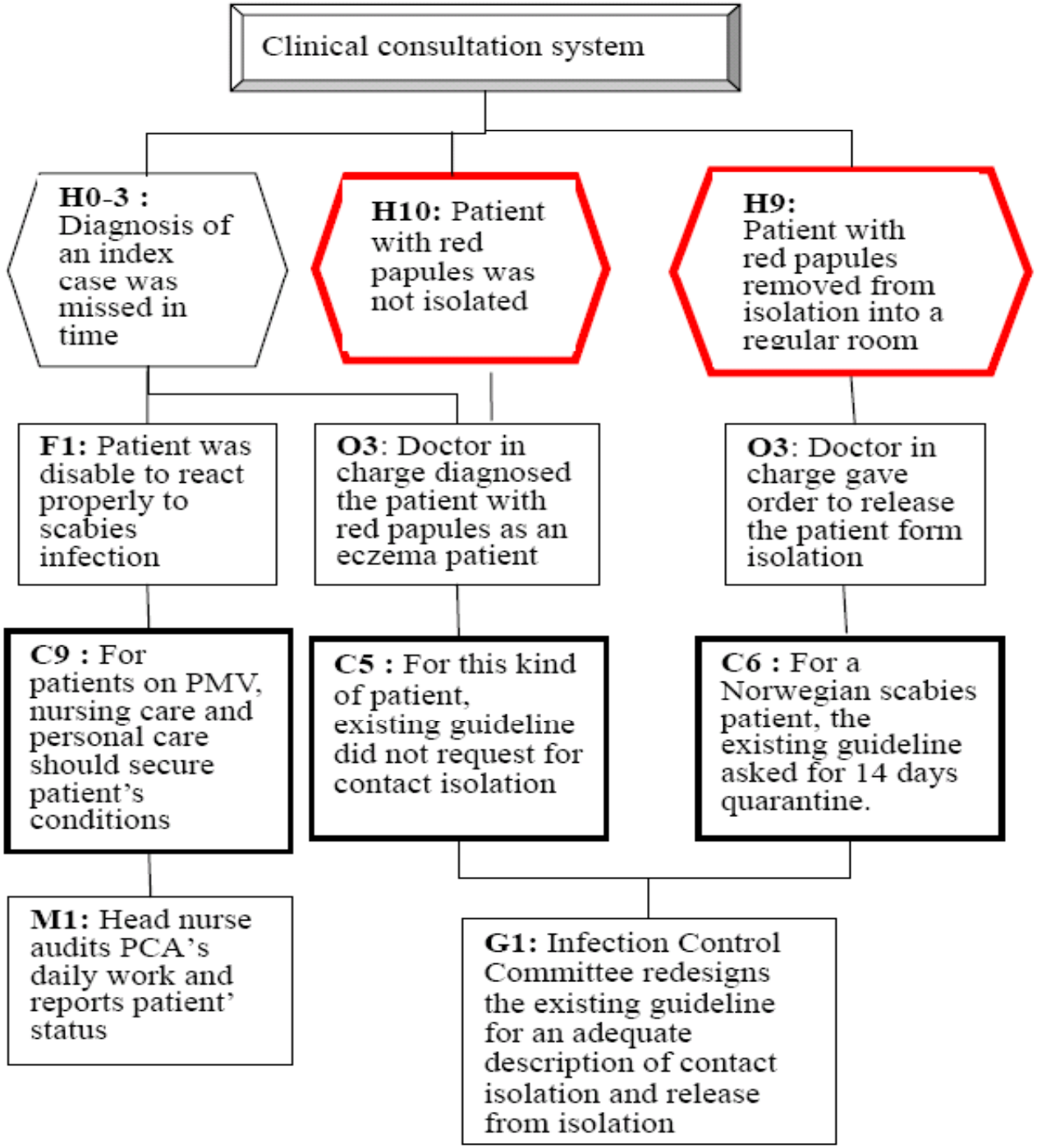
Event-Map of the third scabies outbreak

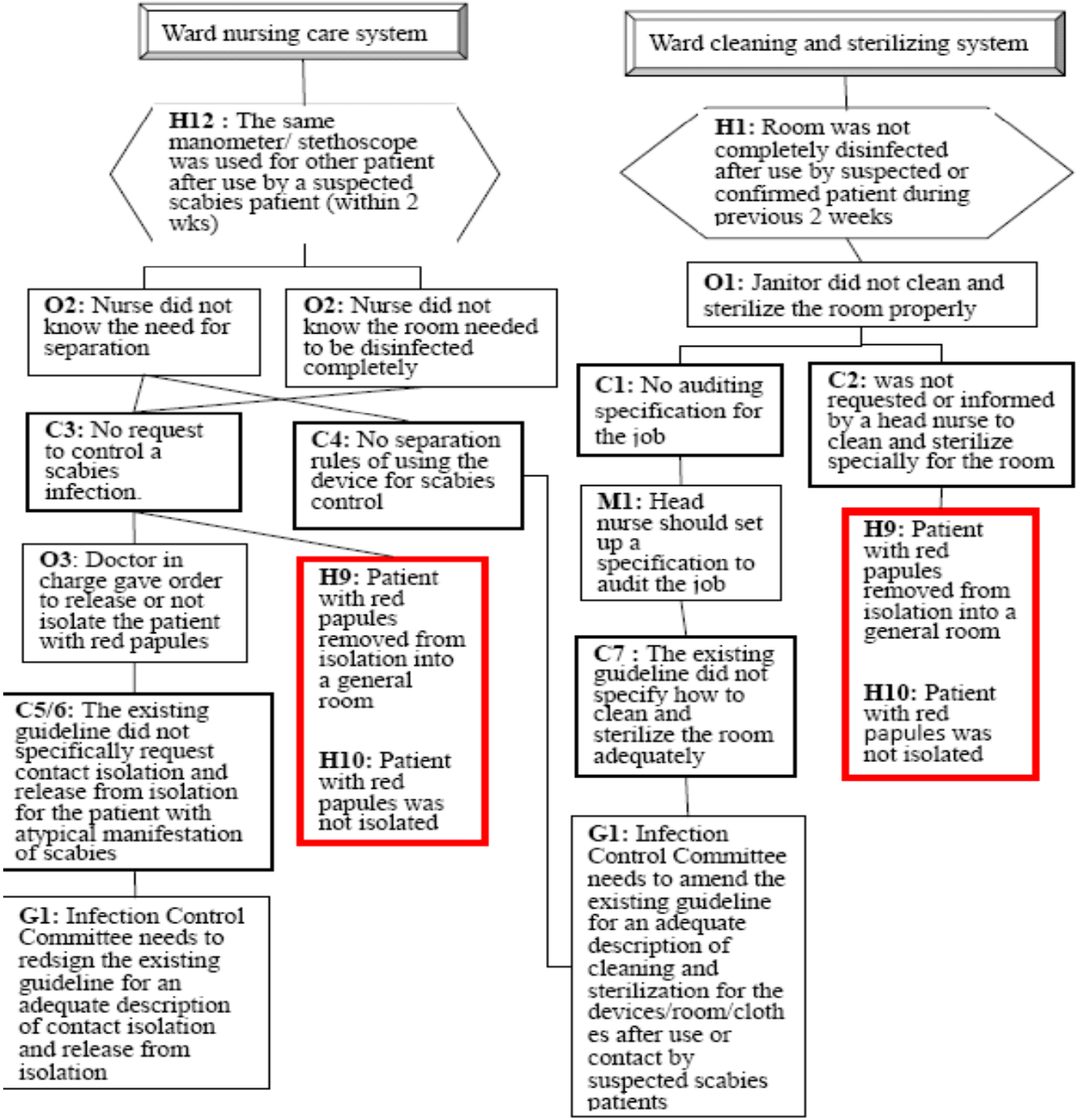
RC 22 (room 22)				**Dirty equipment room**	
RC20	④D	④D		**Ward kitchen**	
RC18	④D	①A		RC26	⑤E ④D (13)K
RC16	(12)L				
RC12				**Nursing Station** ⑤E ⑥F ⑦G	
RC10	⑨I	③C			
RC08	④D			RC28	⑧H ④D
RC06	⑩J	⑩J		RC30	②B ⑤E ⑥F ⑥F
RC02	(11)K	(11)K			
Bath room				Toilet	
Seminar room				Main Gate	
Nursing Station				Main Gate	
Change Room				**Machine Room**	
RC01	⑥F			RC11	⑧H (14)N
RC03				RC09	
RC05		⑧H		RC07	⑧H ⑥F
Ward kitchen				**Change room/ Quilt & clothing room**	
Dirty equipment room					

Report date:

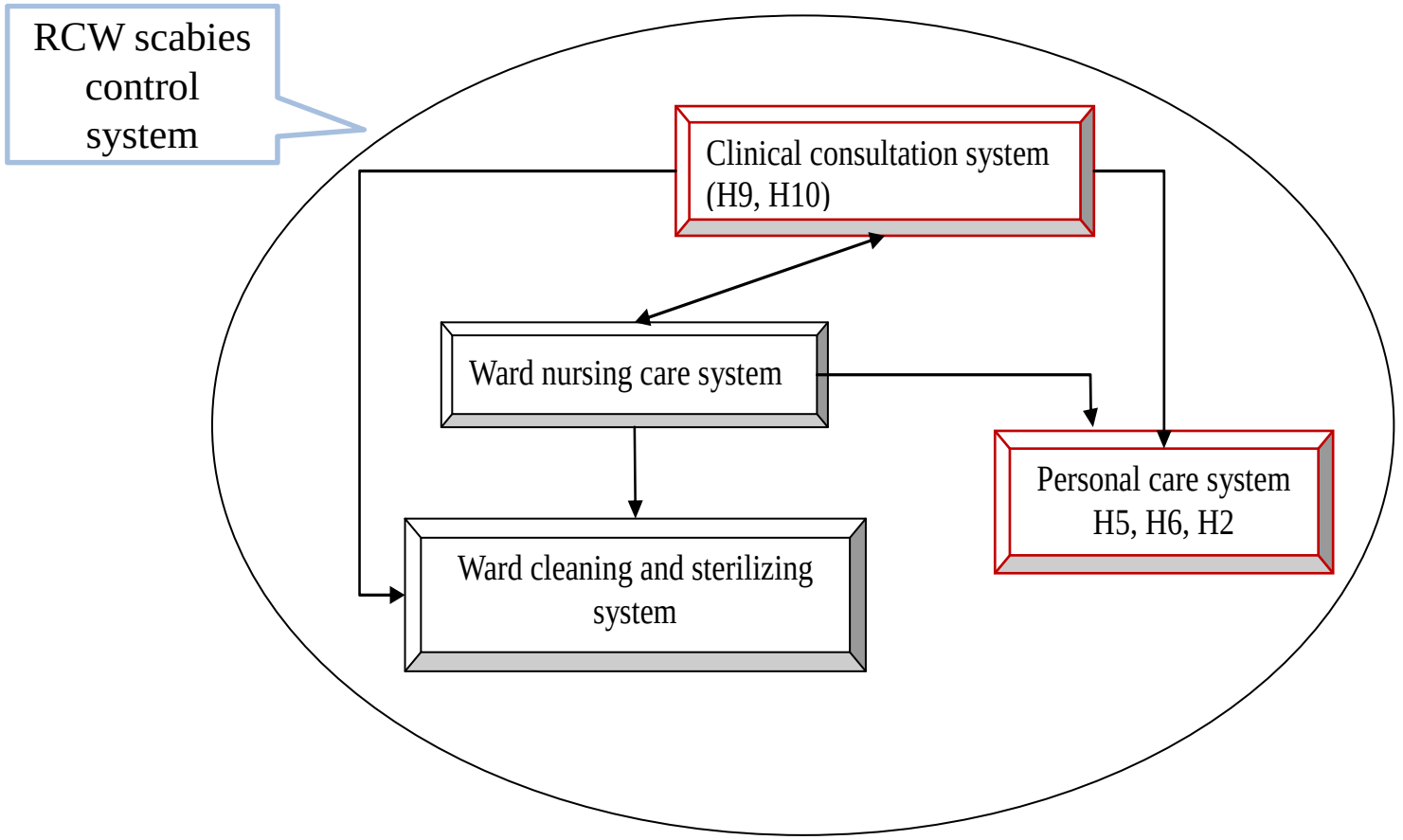
① A:Sep/04/2008
① A:Sep/26/2008
① A:Oct/17/2008
① A:Nov/04/2008
② B:Nov/15/2008
③ C:Dec/03/2008
④ D:Dec/21/2008
⑤ E:Dec/22/2008
⑥ F:Dec/23/2008
⑦ G:Dec/24/2008
⑧ H:Dec/26/2008
⑨ I: Dec/29/2008
⑩ J: Jan/07/2009
(11)K:Jan/29/2009
(12)L:Feb/20/2009
(13)K:Mar/20/2009
(14)N:Mar/29/2009

Note: ①A is the index case


Clinical consultation system
H0-3 : Diagnosis of an index case was missed in time
H10: Patient with red papules was not isolated
H9: Patient with red papules removed from isolation into a regular room
F1: Patient was disable to react properly to scabies infection
O3: Doctor in charge diagnosed the patient with red papules as an eczema patient
O3: Doctor in charge gave order to release the patient form isolation
C9 : For patients on PMV, nursing care and personal care should secure patient's conditions
C5 : For this kind of patient, existing guideline did not request for contact isolation
C6 : For a Norwegian scabies patient, the existing guideline asked for 14 days quarantine.
M1: Head nurse audits PCA's daily work and reports patient' status
G1: Infection Control Committee redesigns the existing guideline for an adequate description of contact isolation and release from isolation


Ward nursing care system
H12 : The same manometer/ stethoscope was used for other patient after use by a suspected scabies patient (within 2 wks)
O2: Nurse did not know the need for separation
O2: Nurse did not know the room needed to be disinfected completely
C3: No request to control a scabies infection.
C4: No separation rules of using the device for scabies control
O3: Doctor in charge gave order to release or not isolate the patient with red papules
H9: Patient with red papules removed from isolation into a general room
H10: Patient with red papules was not isolated
C5/6: The existing guideline did not specifically request contact isolation and release from isolation for the patient with atypical manifestation of scabies
G1: Infection Control Committee needs to redsign the existing guideline for an adequate description of contact isolation and release from isolation
Ward cleaning and sterilizing system
H1: Room was not completely disinfected after use by suspected or confirmed patient during previous 2 weeks
O1: Janitor did not clean and sterilize the room properly
C1: No auditing specification for the job
C2: was not requested or informed by a head nurse to clean and sterilize specially for the room
M1: Head nurse should set up a specification to audit the job
H9: Patient with red papules removed from isolation into a general room
H10: Patient with red papules was not isolated
C7 : The existing guideline did not specify how to clean and sterilize the room adequately
G1: Infection Control Committee needs to amend the existing guideline for an adequate description of cleaning and sterilization for the devices/room/clothes after use or contact by suspected scabies patients

System hierarchy: System-in-focus

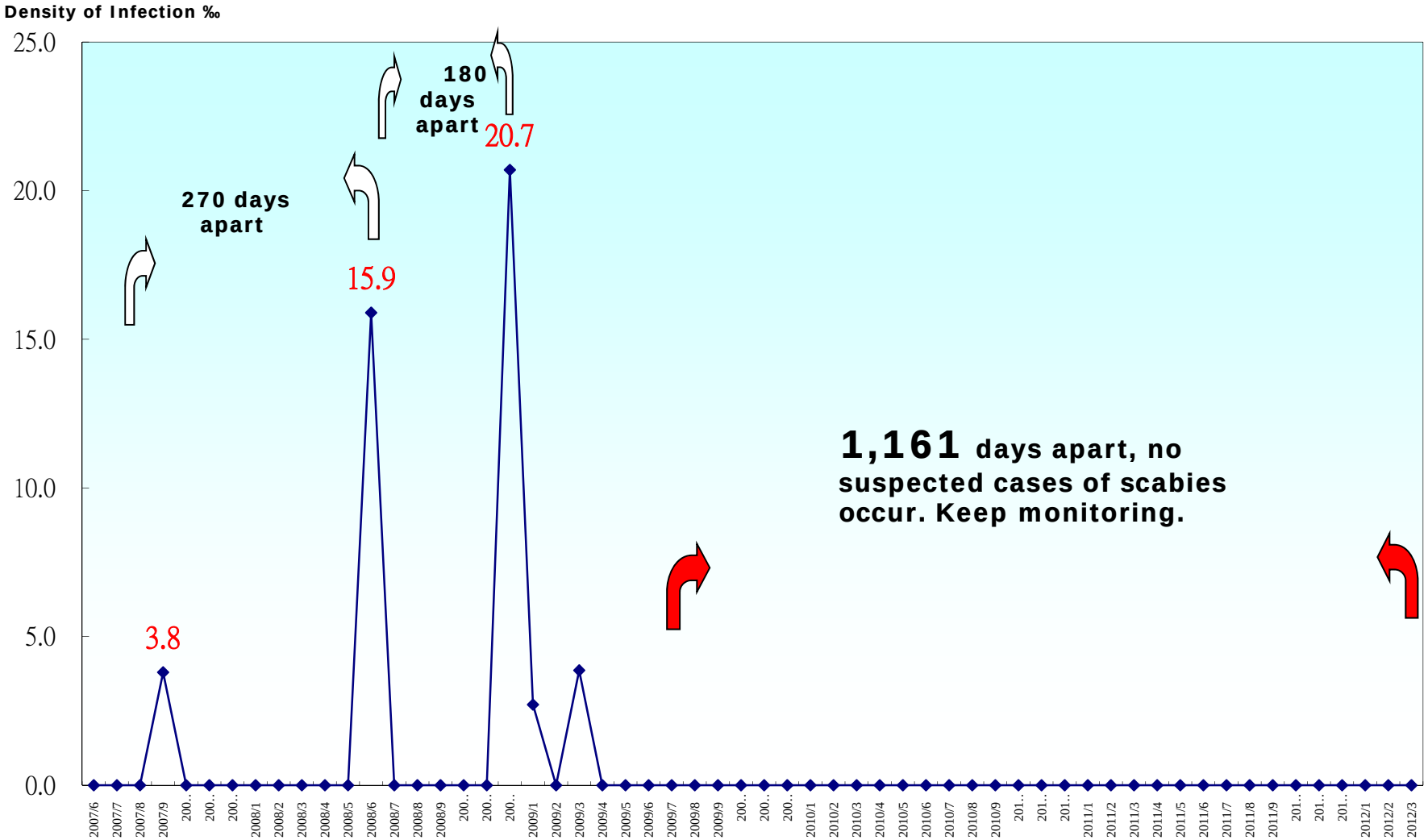


Major recommended risk controls

Method	Hazards discovered	Major recommended risk controls
1st outbreak RCA	H0-1, H0-2 (disturbance 1)	➢ Nursing department requested visitors to report their skin condition in a self-declaration form.
2nd outbreak RCA	H0-3, H9, H10, H11 (disturbance 2)	➢ Patients who is suspected to be scabies infected can be isolated for one week and treated with anti-scabies medicine
3rd outbreak RCA	H0-3, H9, H10, H11 (disturbance 3)	➢ Suspected patients to be isolated for two weeks and to take preventive medicine. ➢ Patients with Norwegian scabies to be isolated for two months.
3rd outbreak: SOEA	H1 ~ H8, H9, H10, H11, H12 (disturbance 2 & 3)	➢ Four subsystems: physician consultation system, ward nursing care system, personal care system, and ward cleaning and sterilizing system were identified for improvement in an integrated structure across both horizontal and vertical levels ➢ Isolation period to be adjusted by the doctor-in-charge according to patient's condition

SOEA: System Oriented Event Analysis

Results



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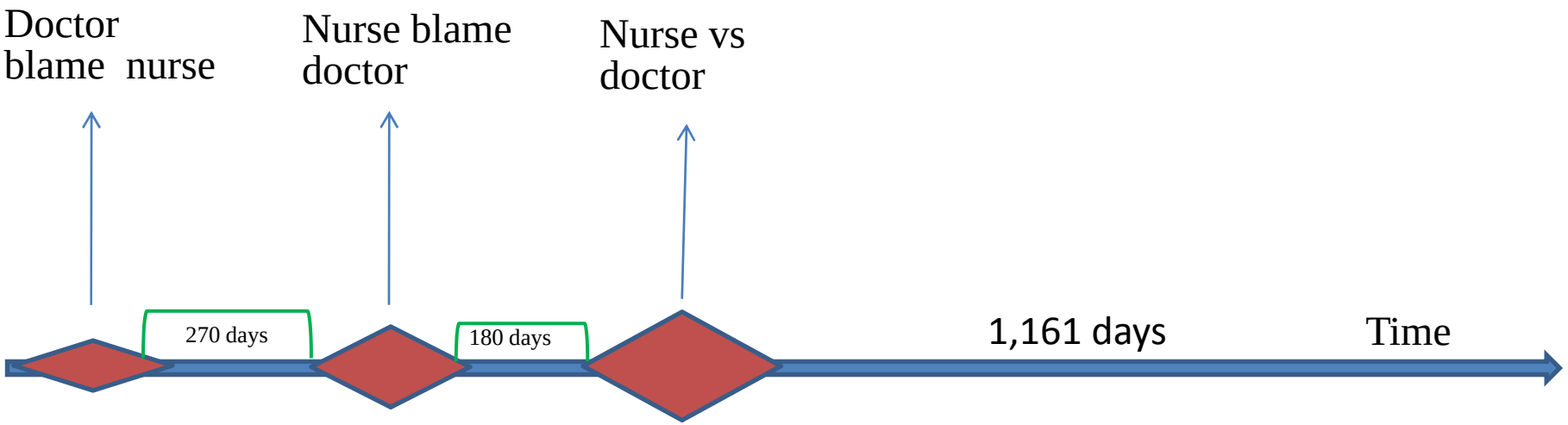
Past, current and future



RCA

-Policy changes
-New procedures
-"Fixes" for RCA "Causes"

SOEA

-Integrated prevention activities with adaptive treatments for controlling scabies infection and outbreak

-Workers understand the hazards and developed a new approach to dealing with the hazards

Lesson learnt – 1/3

1. People expect P&P (policies & procedures) to make patient safe. They are wrong.

2. The hospital had safety system based on RCA that did not improve safety. RCA did not point out organizational factors. Including the organizational factors shows how the system weakness allowed outbreak to occur.

Lesson learnt – 2/3

3. SOEA can help create a common ground for collaboration between clinicians.

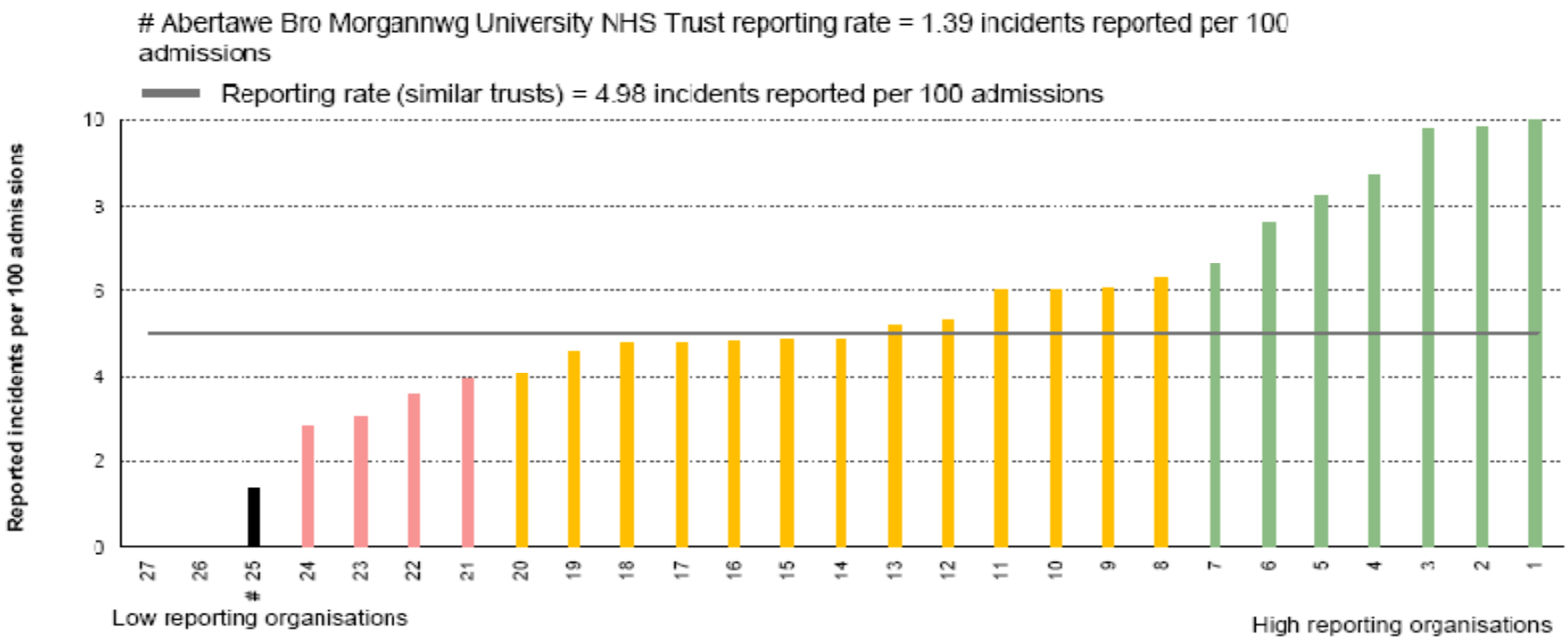
4. The use of SOEA led to system adaption. Adaptation needs collaboration between clinicians in the system. Doctor, nurse, and personal care assistance share responsibilities for detecting and acting on the threat of scabies.

5. The SOEA is valuable for system thinking and increase of adaptive capacity for a health care system.

Question 1. Do you want to call the new system resilient?

Patient safety: incidents reporting

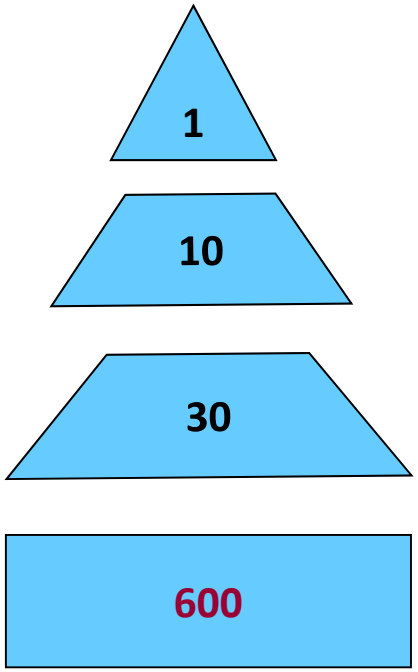
Reporting rate: number of reports occurring between April 2008 to September 2008, per 100 admissions, in Acute teaching trusts



The graph above shows the rates of reported patient safety incidents per 100 admissions for each organisation during the period 1 April 2008 to 30 September 2008. The black bar represents the data from this organisation. There are 27 organisations in this group (see www.npsa.nhs.uk/organisation-categories for a list of organisations).

66%: no harm, 27%: low harm, 6%: moderate harm, 1%: severe harm

Patient safety- Types of incidents



Serious injury

Minor injuries

Property Damage / loss

Incidents with no visible injury or damage

Event investigation→
System resilience →
Resilience Engineering

????

Bird's Theory

Question 2: if there are more opportunities to learn from “incidents”, how do we learn and improve system resilience from them?