AMR Control in Long-term Care Facilities

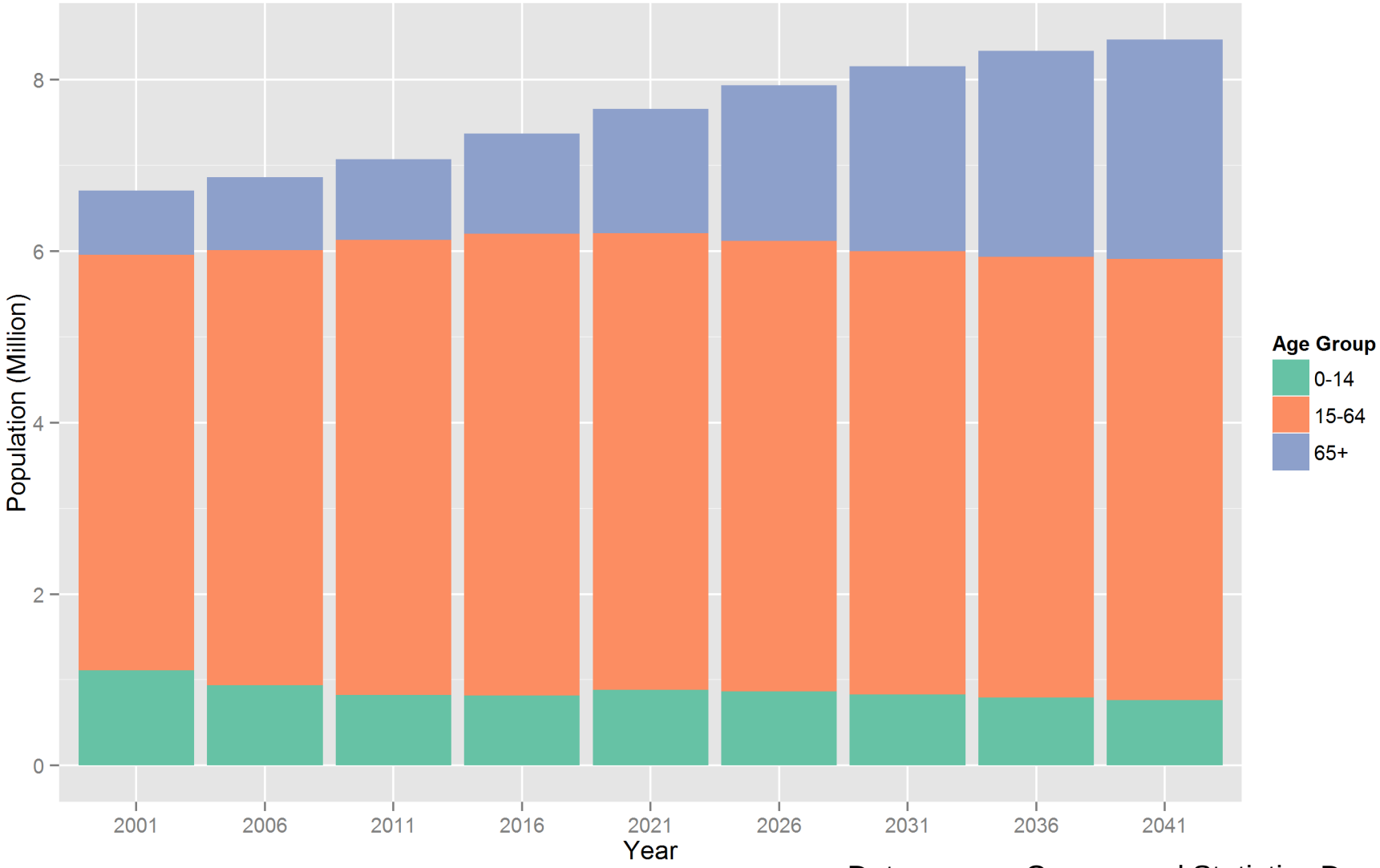
Special Session 3
7 May 2018 (pm)
Dr. Chen Hong
ICB/CHP
IDCTC/Q&SD/HAHO

Content

- Ageing population in Hong Kong
- Residential Care Homes of Elderly (RCHEs)
- Infection control in RCHEs
- Control of AMR in RCHEs

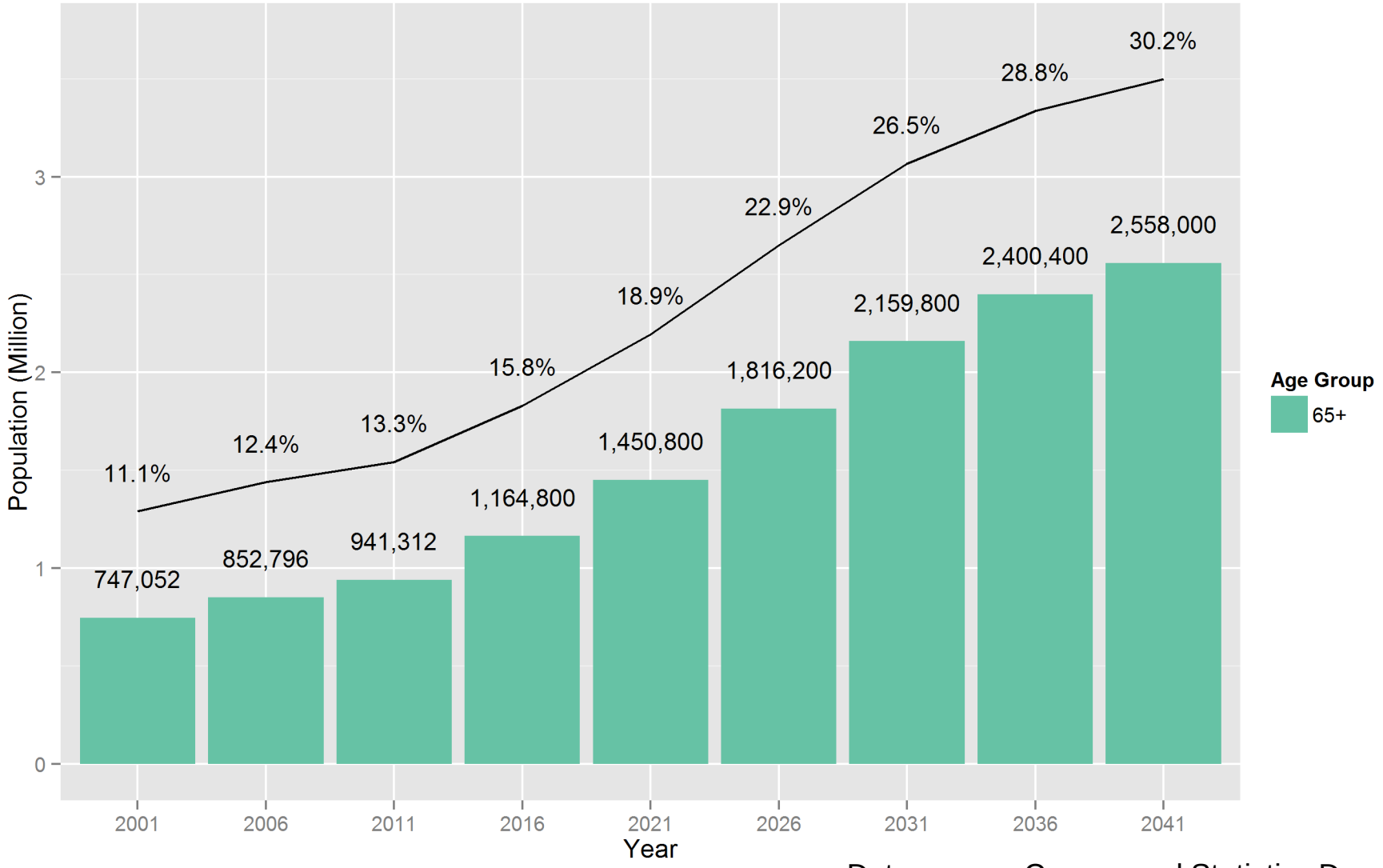
AGEING POPULATION

Ageing Population in Hong Kong



Data source: Census and Statistics Department

Number and Proportion of Elderly (2001 to 2041)

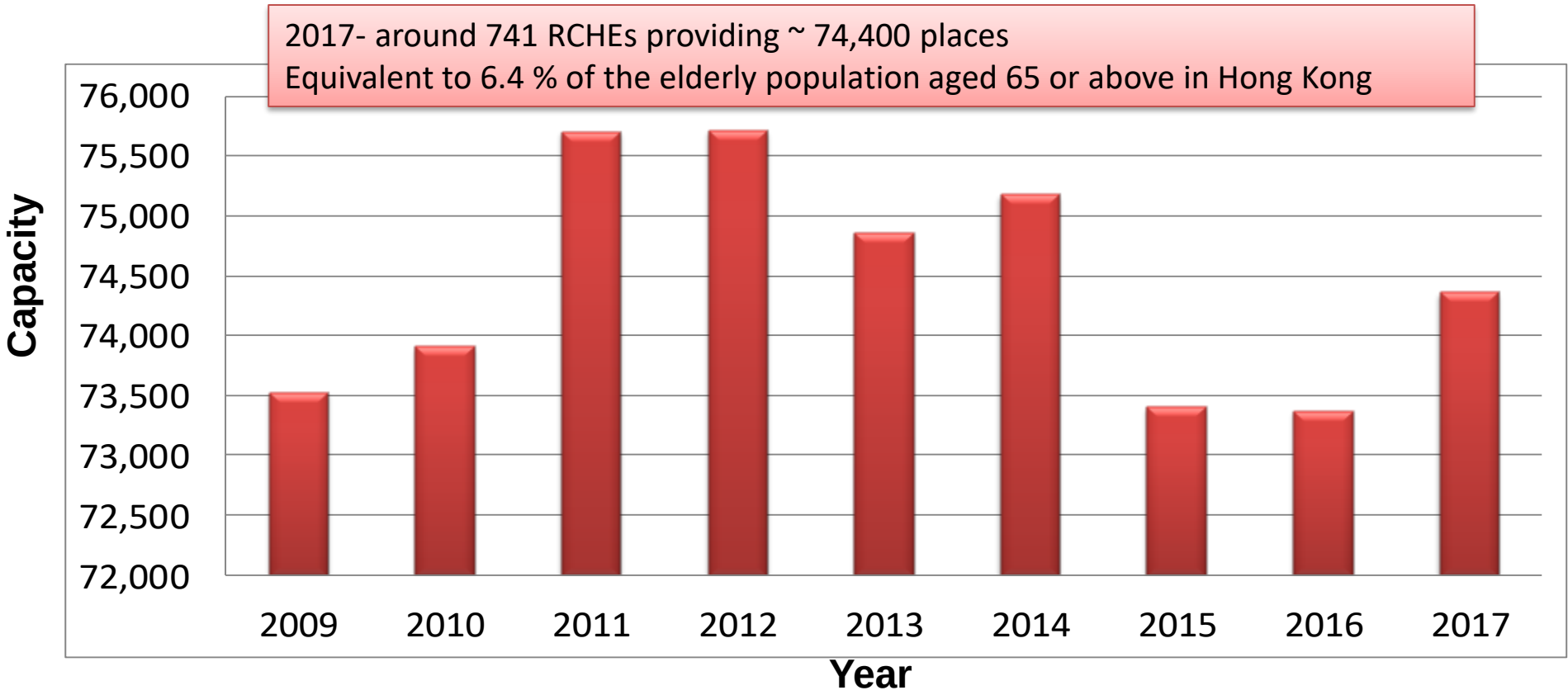


Data source: Census and Statistics Department

RESIDENTIAL CARE HOMES OF ELDERLY (RCHES) IN HONG KONG

RCHEs in Hong Kong (1)

- Increasing demand for RCHE service in Hong Kong
- With ageing population, more people may require temporary or permanent placement in RCHEs.



Total Capacity as of 31 Mar of the year, data from Social Welfare Department

RCHE in Hong Kong (2)

- RCHE is a heterogeneous group of institutions
- Types of Residential Care Homes
  - Varying types of residential care homes are set up to meet different care needs of elders

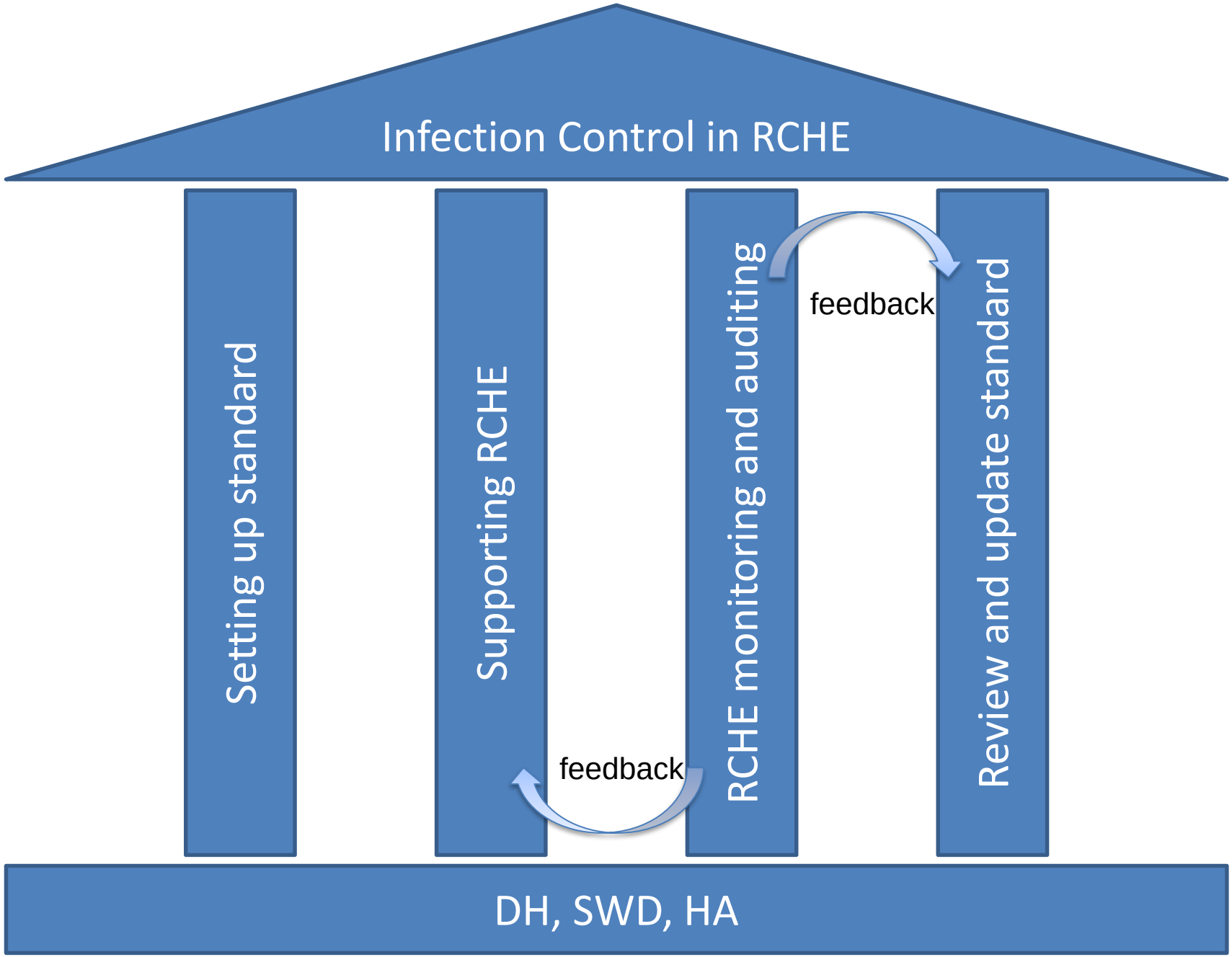
- Nature of RCHE – private (profit making) and non-private (subvented/ contract / self financing)

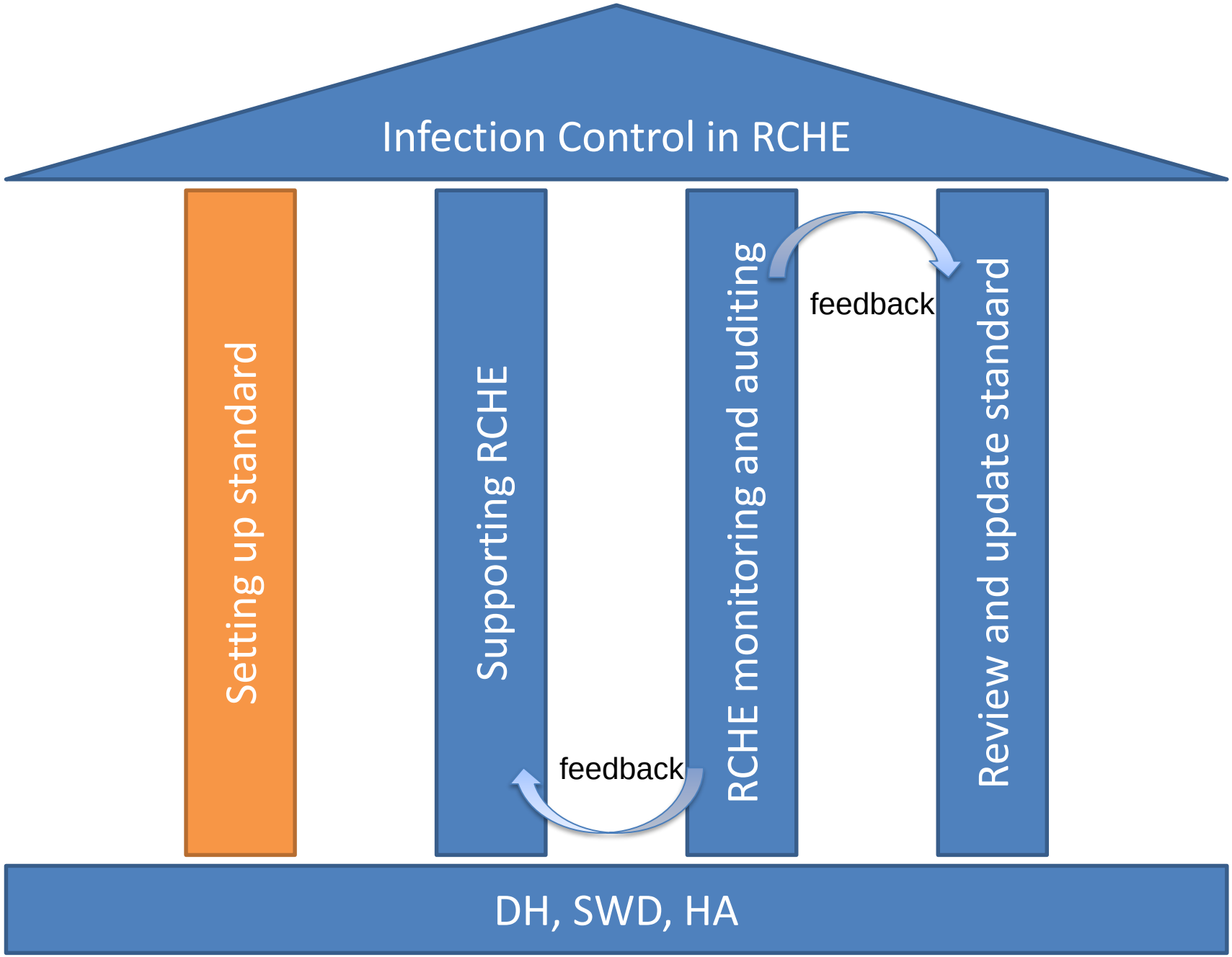
RCHE in Hong Kong (3)

Regulatory Aspects

- Social Welfare Department (SWD): the Licensing Office of Residential Care Homes for the Elderly (LORCHE)
  - is responsible for enforcing statutory provisions under the Ordinance applicable to subvented, contract, self-financing non-profit-making and private RCHEs
  - the Residential Care Homes (Elderly Persons) Ordinance Cap 459 (the Ordinance) and its subsidiary legislation
- Department of Health (DH) : Office of Regulation of Private Healthcare Facilities
  - is the registration authority of Nursing Homes, applicable to Contract homes and Self-financing RCHEs which have NH places as well as subvented NH
  - the Hospitals, Nursing Homes (NH) and Maternity Homes Registration Ordinance (Cap.165)

INFECTION CONTROL IN RCHE


Infection Control in RCHE
Setting up standard
Supporting RCHE
RCHE monitoring and auditing
Review and update standard
feedback
feedback
DH, SWD, HA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DH, SWD, HA

Setting Standard (1)

All RCHEs must comply with the **Code of Practice** issued by **the Social Welfare Department (SWD) –** 2013 revised version

Chapter 12	**Infection Control**
12.1	General
12.2	Duties of Infection Control Officer (ICO)
12.3	Prevention of Infectious Diseases
12.4	Management of Infectious Diseases
12.5	Other Information

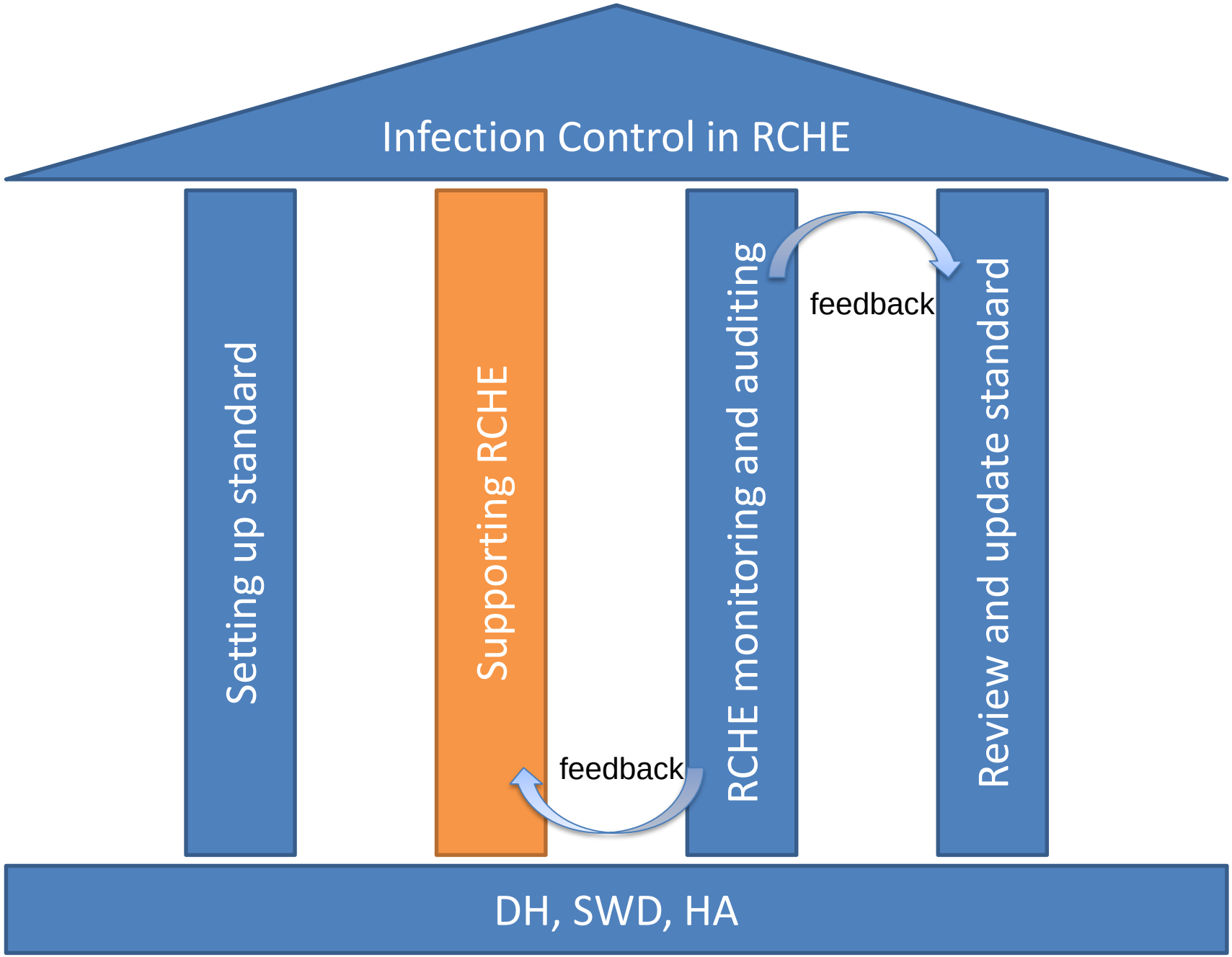
Setting Standard (2)

- Each RCHE is required to designate an **Infection Control Officer (ICO)** to coordinate matters related to the prevention and handling of infectious diseases in RCHEs (effective from November 2003)
  - Either a nurse or a health worker
  - Role and responsibilities listed in the code of Practice issued by SWD
- Isolation facilities /Rooms

Setting Standard (3)

Guidelines on Prevention of Communicable Diseases in Residential Care Home for the Elderly (3rd Edition, 2015)

http://www.chp.gov.hk/files/pdf/guidelines_on_prevention_of_communicable_diseases_in_rche_eng.pdf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Collaboration with Stakeholders

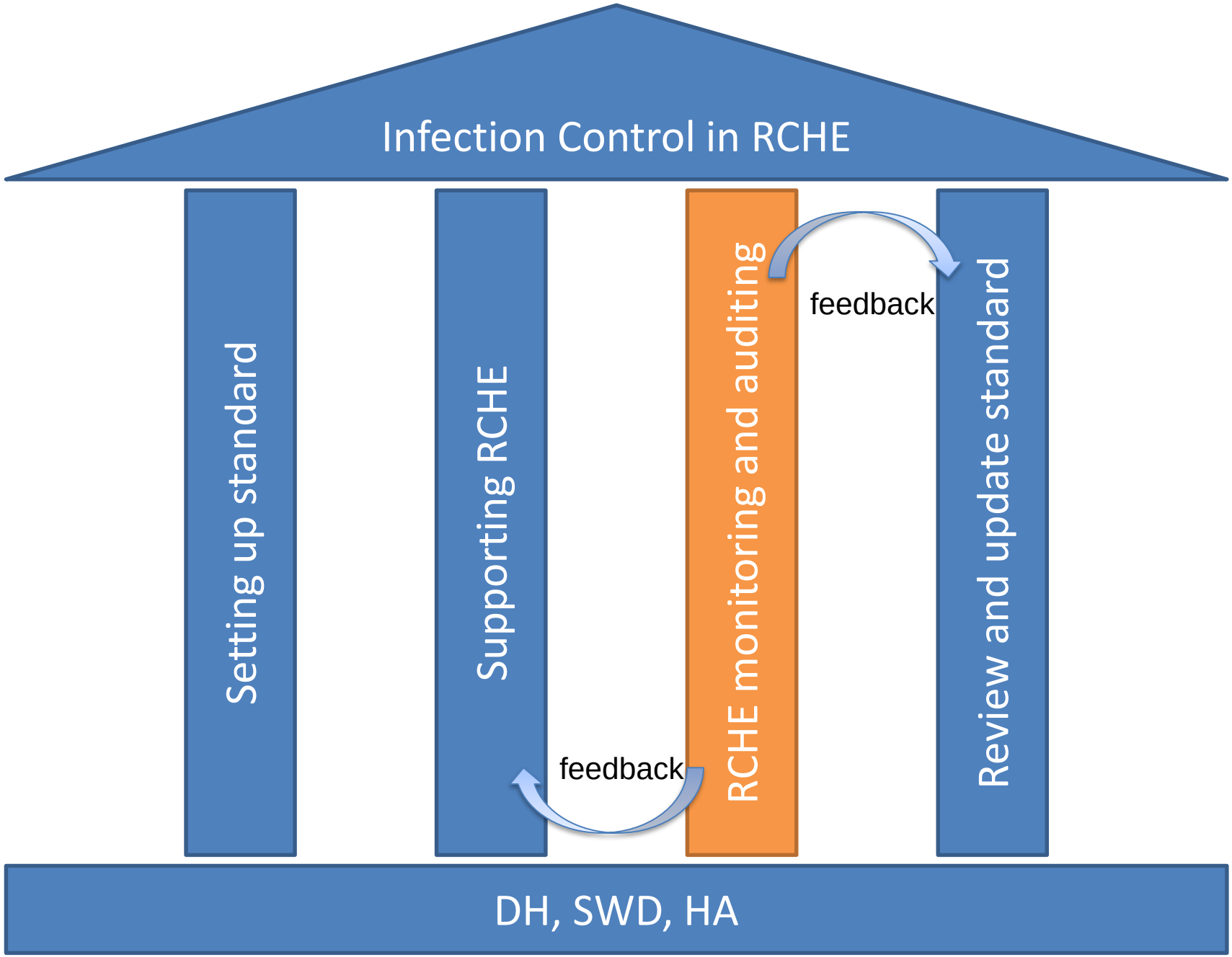
- Stakeholders:
  - Centre for Health Protection (CHP) and EHS (Elderly Health Service) of the Department of Health
  - Community Geriatric Team (CGAT)/ Community Nursing Service (CNS) of the Hospital Authority
  - LORCHE of SWD
- Platforms:
  - Revision of guidelines
  - Training
  - Projects:
    - Infection Control Stewardship Program in RCHEs
    - Enhancement of Infection Control Practice in RCHEs

Training and Support

- **Annual infection control training course by ICB, SEB, EHS and LORCHE**
  - For RCHE ICO/ staff

Year	2010	2011	2012	2013	2014	2015	2016	2017
No. of Staff Trained	1897	1885	1810	1887	1834	1947	1690	1804

- **Training on ad-hoc hot topics by EHS and ICB**
  - e.g. Control of emerging MDROs, Enhancing Hand Hygiene
- **Infection Control Stewardship Program in RCHEs (2010-2012)**
  - Tailor-made out reach infection control training to RCHEs
- **Enhancement of Infection Control Practice in RCHEs (2013-2015)**
  - Out reach infection control training to 50 needy homes with hotline support
- **Infection Prevention Program in RCHEs (2016-2018)**
- **Hand Hygiene Ambassador Program in RCHEs (2017)**
- **RCHE MDRO Preparatory Training**
  - Support RCHE to care MDRO carrier
- **Outreaching support services**
  - VHTs - outreach training; in response to the request on other relevant care providers
  - CGAT/CNS - in relation to care management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RCHE Monitoring and Auditing

- **Visiting Health Teams (VHTs), Elderly Health Service (EHS), DH**
  - VHTs started to assess the infection control capability , training needs of RCHEs since 2003
  - Annual Integrated Assessment with Infection Control by VHT nurses of EHS who visit **all RCHEs**
    - Inspection of RCHE environment e.g isolation facilities
    - Questionnaires on infection control knowledge and practices e.g. proper cleansing of vomitus
    - Skill assessment on infection control e.g. correct use of PPE and hand washing

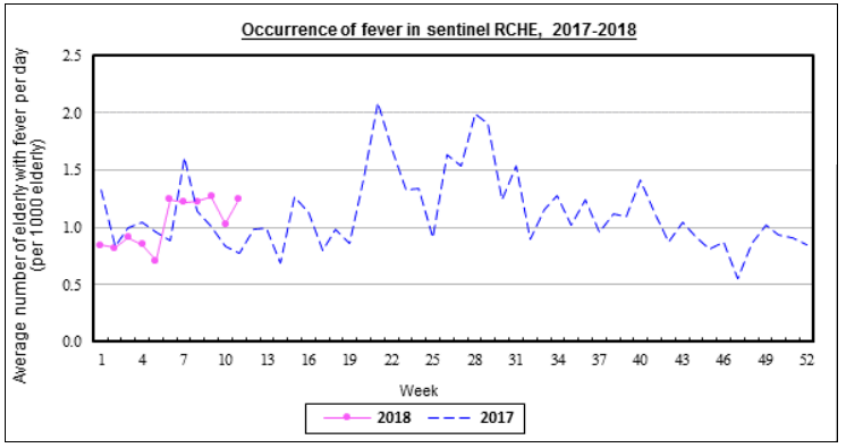
RCHE Monitoring and Auditing

Surveillance

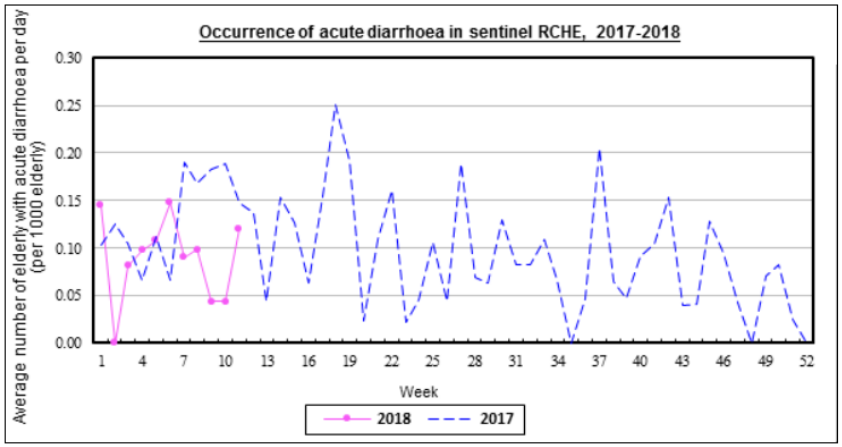
- Sentinel surveillance of fever/vomiting/diarrhoea in RCHEs by SEB http://www.chp.gov.hk/en/sentinel_centre/26/44/320.html
- Prevalence survey of common infections among residents of RCHE by ICB in 2014
  - Overall prevalence: 2.71%
  - Top 3 Infections: RTI (1.33%); SSTI (0.70%); UTI (0.53%)

Sentinel Surveillance of Fever and Diarrhea

II. Surveillance of Fever symptom



III. Surveillance of Acute diarrhoea symptom



Prevalence of infections among residents of Residential Care Homes for the Elderly in Hong Kong

Carmen SM Choy *, H Chen, Carol SW Yau, Enoch K Hsu, NY Chik, Andrew TY Wong

ABSTRACT

Introduction: A point prevalence study was conducted to study the epidemiology of common infections among residents in Residential Care Homes for the Elderly in Hong Kong and their associated factors.

Methods: Residential Care Homes for the Elderly in Hong Kong were selected by stratified single-stage cluster random sampling. All residents aged 65 years or above from the recruited homes were surveyed. Infections were identified using standardised definitions. Demographic and health information—including medical history, immunisation record, antibiotic use, and activities of daily living (as measured by Barthel Index)—was collected by a survey team to determine any associated factors.

Results: Data were collected from 3857 residents in 46 Residential Care Homes for the Elderly from February to May 2014. A total of 105 residents had at least one type of infection based on the survey definition. The overall prevalence of all infections was 2.7% (95% confidence interval, 2.2%-3.4%). The three of daily living, as indicated by low Barthel Index score of 0 to 20 (odds ratio=3.0; 95% confidence interval, 1.4-6.2), and presence of a wound or stoma (odds ratio=2.7; 95% confidence interval, 1.4-4.9) were significantly associated with presence of infection.

Conclusions: This survey provides information about infections among residents in Residential Care Homes for the Elderly in the territory. Local data enable us to understand the burden of infections and formulate targeted measures for prevention.

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[1] **CSM Choy ***, MB, BS
[2] **H Chen**, MB, BS, FHKAM (Community Medicine)
[3] **CSW Yau**, MB, BS, FHKAM (Community Medicine)
[2] **EK Hsu**, BSc, MSc
[2] **NY Chik**, BNurs
[2] **ATY Wong**, MB, BS, FHKAM (Medicine)

[1] *Accident and Emergency Department, Queen Elizabeth Hospital, Jordan,*

TABLE 4. Prevalence of different types of infections among residents of Residential Care Homes for the Elderly

	No. of cases	Prevalence (95% CI) [%*]
All infections	105	2.71 (2.15-3.42)
Respiratory tract infection†	53	1.33 (0.93-1.89)
Pharyngitis	27	0.66 (0.35-1.23)
Bronchitis or tracheobronchitis	16	0.41 (0.21-0.78)
Influenza-like illness	7	0.19 (0.08-0.43)
Pneumonia	5	0.13 (0.05-0.31)
Upper respiratory tract infection	5	0.13 (0.05-0.38)
Tuberculosis	2	0.04 (0.01-0.17)
Skin and soft tissue infection	27	0.70 (0.47-1.04)
Cellulitis	20	0.51 (0.30-0.85)
Herpes	3	0.08 (0.02-0.24)
Fungal infection	2	0.06 (0.02-0.22)
Scabies	2	0.05 (0.01-0.20)
Urinary tract infection	19	0.53 (0.32-0.86)
Eye, ear, nose, and mouth infection	7	0.20 (0.09-0.41)
Conjunctivitis	4	0.11 (0.05-0.27)
Ear infection	1	0.02 (0.00-0.16)
Gingivitis	1	0.03 (0.00-0.20)
Uncategorised	1	0.03 (0.00-0.19)
Gastrointestinal tract infection	1	0.03 (0.00-0.19)
Systemic infection	1	0.02 (0.00-0.16)

Abbreviation: CI = confidence interval

* % Rates presented were adjusted for the sampling method

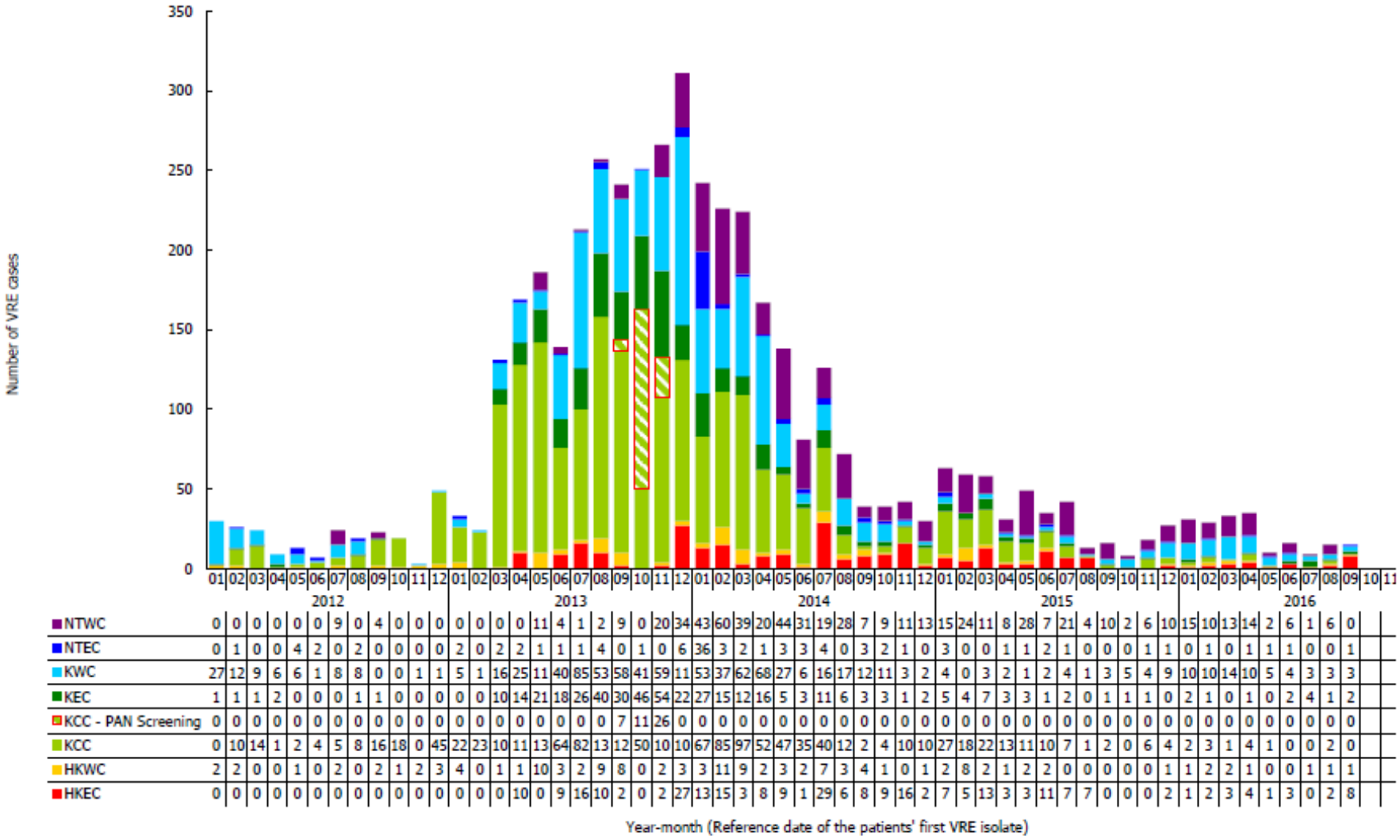
† 45 Residents had one type, seven had two types, and one had three types of respiratory tract infections diagnosed

Control of AMR in RCHEs

Content

- Statistics of Vancomycin Resistant Enterococcus (VRE) Discharged to RCHEs
- Statistics of Carbapenemase Producing Enterobacteriaceae (CPE) Discharged to RCHEs
- Preparing the RCHEs to receive MDRO carriers
- Monitoring of IC practice of the RCHEs
- Duration of VRE carriage
- Duration of CPE carriage

Monthly new VRE cases (screening and clinical specimens included) in HA hospitals by cluster as of 11/10/2016



	2012												2013												2014												2015												2016									
	01	02	03	04	05	06	07	08	09	10	11	12	01	02	03	04	05	06	07	08	09	10	11	12	01	02	03	04	05	06	07	08	09	10	11	12	01	02	03	04	05	06	07	08	09	10	11	12	01	02	03	04	05	06	07	08	09	10	11
NTWC	0	0	0	0	0	0	9	0	4	0	0	0	0	0	0	0	11	4	1	2	9	0	20	34	43	60	39	20	44	31	19	28	7	9	11	13	15	24	11	8	28	7	21	4	10	2	6	10	15	10	13	14	2	6	1	6	0	
NTEC	0	1	0	0	4	2	0	2	0	0	0	0	2	0	2	2	1	1	1	4	0	1	0	6	36	3	2	1	3	3	4	0	3	2	1	0	3	0	0	1	1	2	1	0	0	0	1	1	0	1	0	1	1	1	0	0	1	
KWC	27	12	9	6	6	1	8	8	0	0	1	1	5	1	16	25	11	40	85	53	58	41	59	11	53	37	62	68	27	6	16	17	12	11	3	2	4	0	3	2	1	2	4	1	3	5	4	9	10	10	14	10	5	4	3	3	3	
KEC	1	1	1	2	0	0	0	1	1	0	0	0	0	0	10	14	21	18	26	40	30	46	54	22	27	15	12	16	5	3	11	6	3	3	1	2	5	4	7	3	3	1	2	0	1	1	1	0	2	1	0	1	0	2	4	1	2	
KCC - PAN Screening	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7	11	26	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
KCC	0	10	14	1	2	4	5	8	16	18	0	45	22	23	10	11	13	64	82	13	12	50	10	10	67	85	97	52	47	35	40	12	2	4	10	10	27	18	22	13	11	10	7	1	2	0	6	4	2	3	1	4	1	0	0	2	0	
HKWC	2	2	0	0	1	0	2	0	2	1	2	3	4	0	1	1	10	3	2	9	8	0	2	3	3	11	9	2	3	2	7	3	4	1	0	1	2	8	2	1	2	2	0	0	0	0	0	1	1	2	2	1	0	0	1	1	1	
HKEC	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	10	0	9	16	10	2	0	2	27	13	15	3	8	9	1	29	6	8	9	16	2	7	5	13	3	3	11	7	7	0	0	0	2	1	2	3	4	1	3	0	2	8	

Data source: CDARS Standard Report - VRE new case listing (as of 11/10/2016)

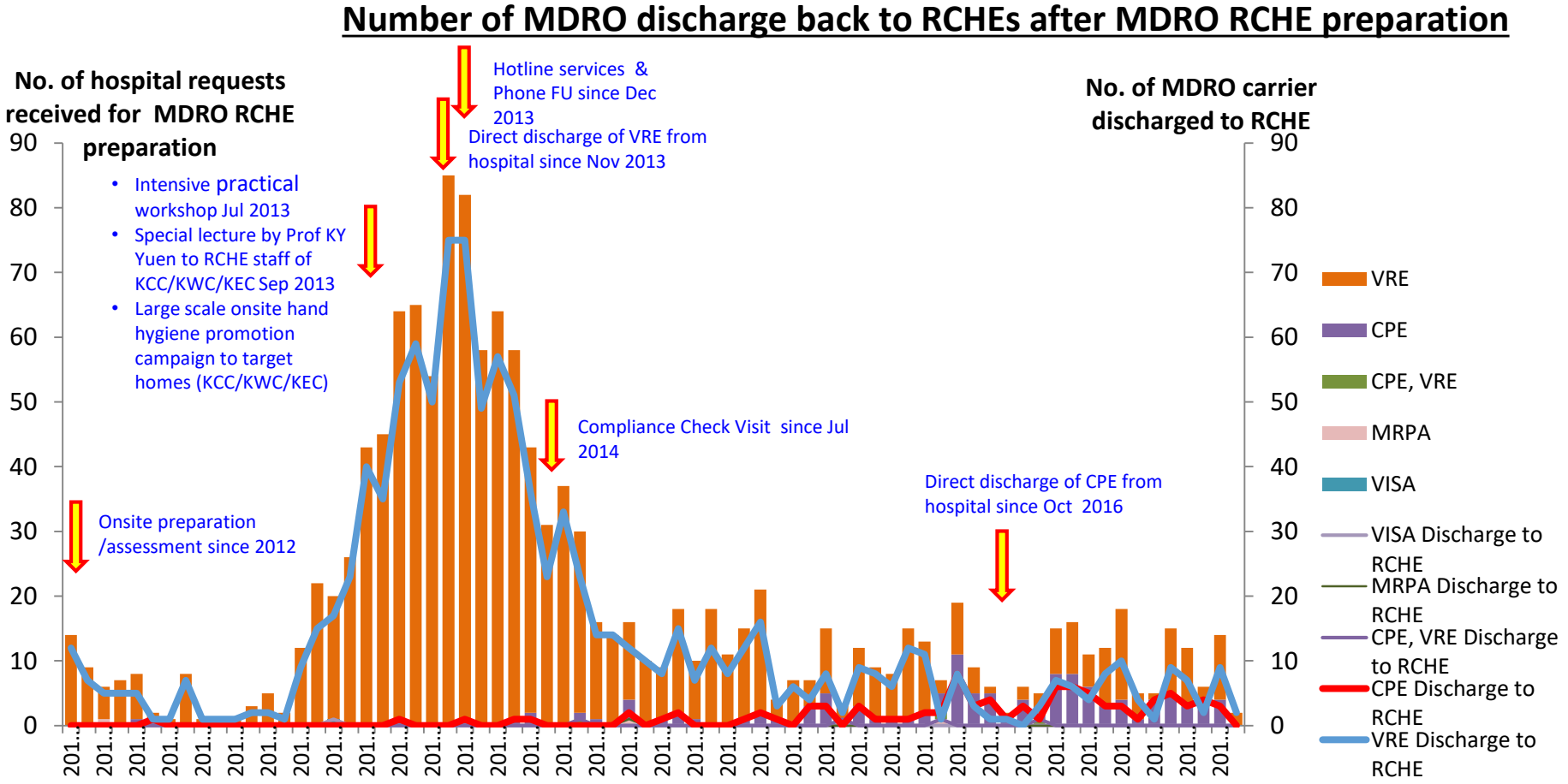
Case definition

1. Data included are from 01/01/2008 to the date mentioned above (by reference date), the figures of the last four weeks are subject to change as lab result of some collected specimen may be not yet available;
2. VRE = (Enterococcus Faecium or Enterococcus Faecalis) and [(resistant to vancomycin (MIC result overrides disc-diffusion result) or (isolated from different VRE screening programmes)];
3. Each patient (by HKID) will be counted once only (the first VRE +ve);
4. **Please be reminded that new case identified in the cluster does not necessarily mean the case acquired VRE in the cluster.**

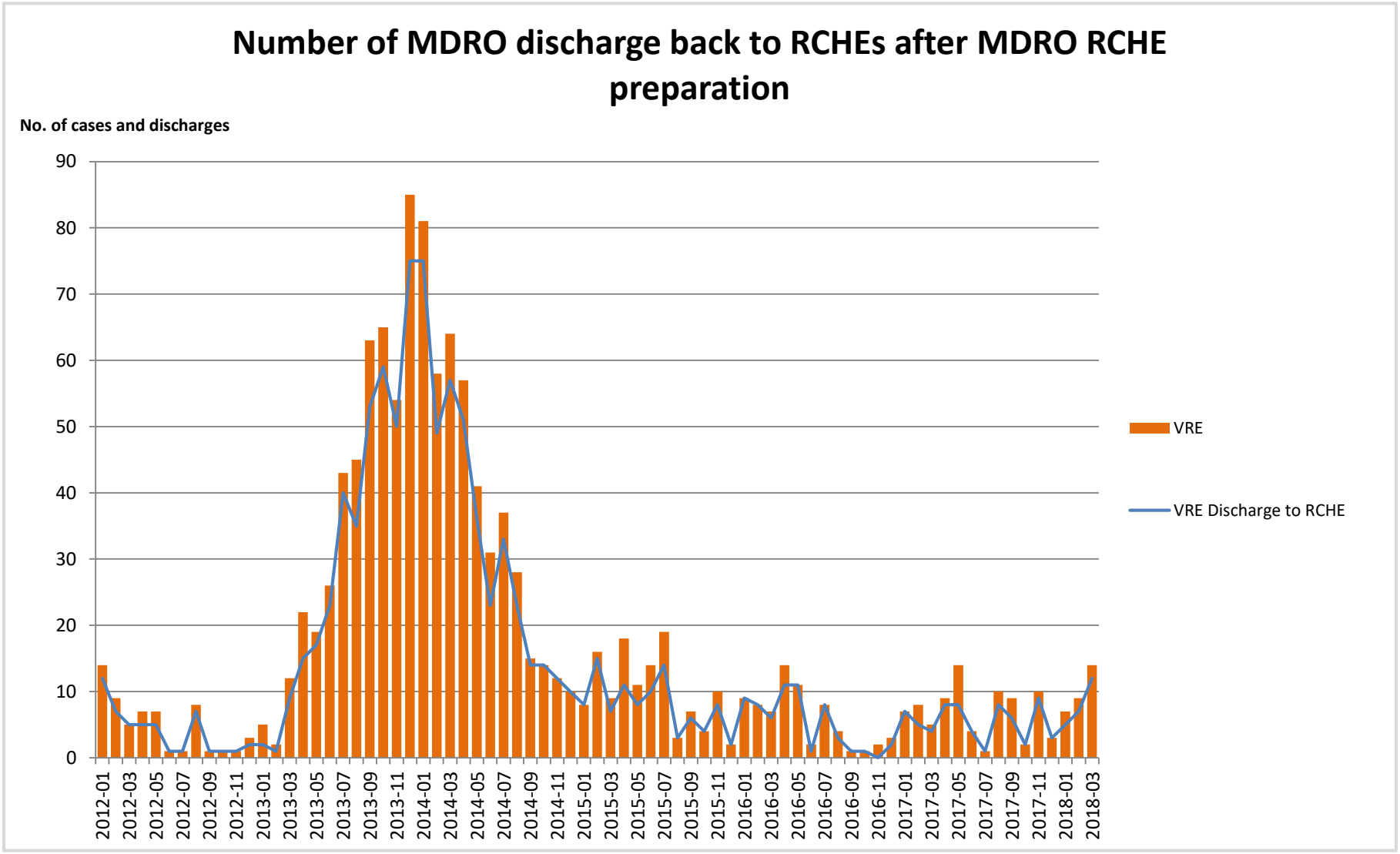
Preparation of RCHE to Receive MDRO Carriers

- Staff of all RCHEs have been training on management of MDRO carriers by annual training
- The RCHE would be alerted by nurse of the ward upon the discharge of VRE/CPE carriers from hospital
- Infection control advices and precautions would be reinforced
- MDRO discharge information sheet and poster would be given to the RCHE together with other discharge information
- Monthly screening of the MDRO status after discharge back to RCHEs
- Infection control Branch(ICB) and Community Geriatric Assessment Team(CGAT) would assess and monitor infection control compliance of RCHEs after the discharge
- Licensing Office of Residential Care Homes of the Elderly (LORCHE) of Social Welfare Department would cover the costs related to additional infection control measures for caring of carriers of emerging MDROs

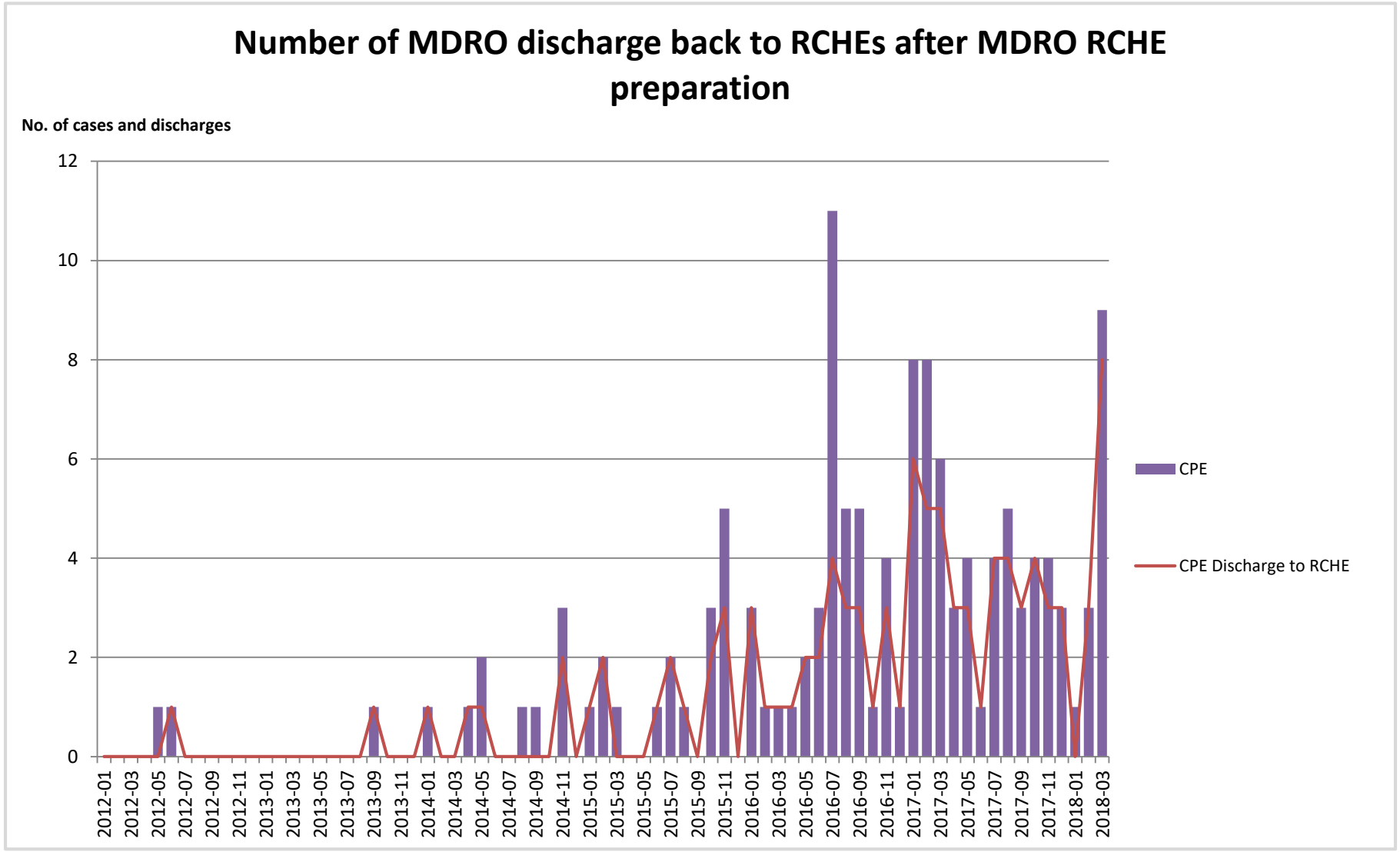
Evaluation of Discharge of MDRO to RCHEs



Statistics of VRE Discharged to RCHEs



Statistics of CPE Discharged to RCHEs



Duration of VRE/CRE Carriage

Country	Setting	Year	Sample size	Organism	Duration of carriage
S. Korea[1]	All inpatients and outpatients with VRE	2012	127	VRE	Median: 5.57 weeks
US[2]	LTCF with a ventilator unit and a sub acute unit	2003	49	VRE	Median: 65 days
Israel[3]	All inpatients with CRE	2013	97	CRE	Median: 295 days

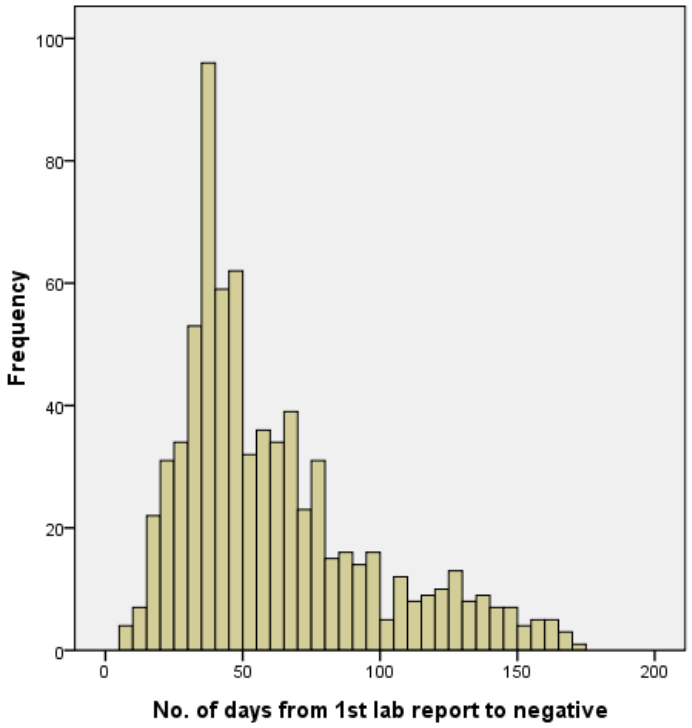
References:

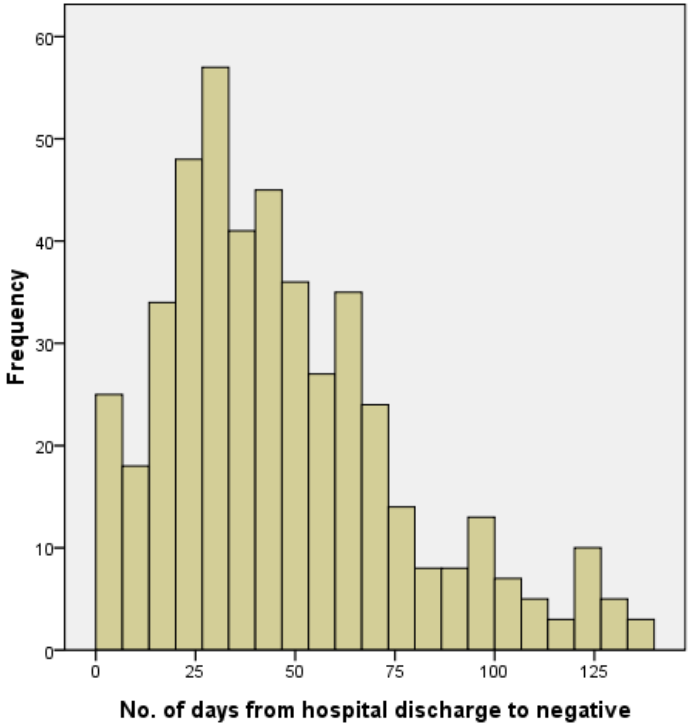
[1]Sohn KM, et al. *Duration of colonization and risk factors for prolonged carriage of vancomycin-resistant enterococci after discharge from the hospital*. Int J Infect Dis. 2013 Apr;17(4):e240-6.

[2]Pacio GA, et al. *Natural history of colonization with vancomycin-resistant enterococci, methicillin-resistant Staphylococcus aureus, and resistant gram-negative bacilli among long-term-care facility residents.* Infect Control Hosp Epidemiol. 2003 Apr;24(4):246-50.

[3]Zimmerman FS, et al. *Duration of carriage of carbapenem-resistant Enterobacteriaceae following hospital discharge*. Am J Infect Control. 2013 Mar;41(3):190-4.

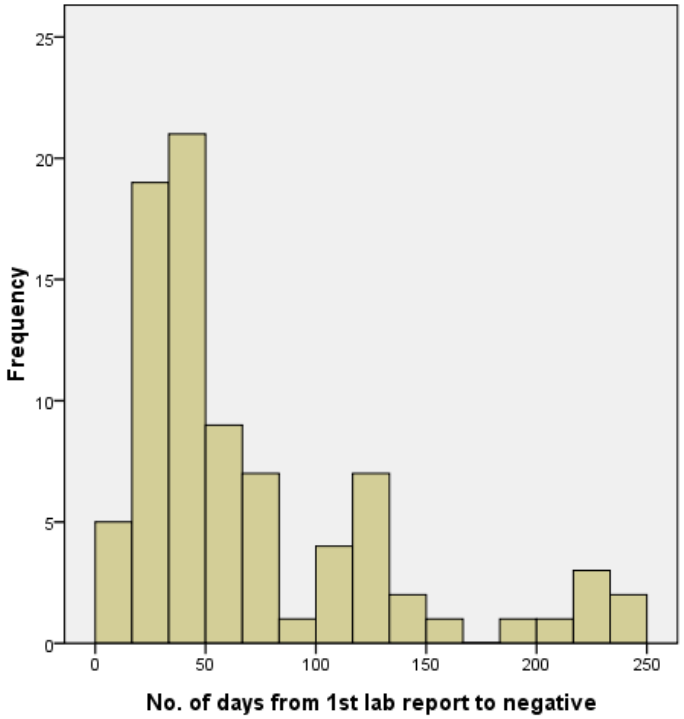
Duration of VRE Carriage

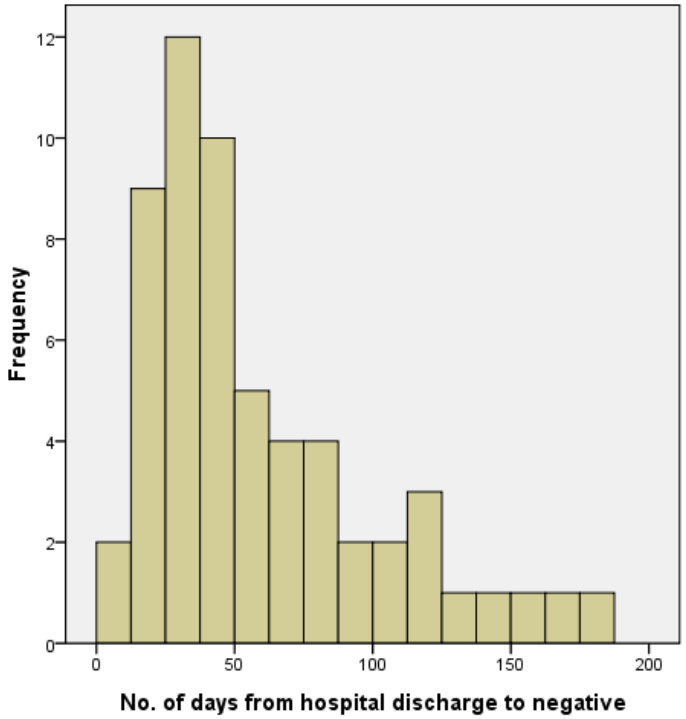




	Mean days to negative	Median days to negative
From 1st lab report	70	49
From hospital discharge	47	41

Duration of CPE carriage





	Mean days to negative	Median days to negative
From 1st lab report	70	45
From hospital discharge	59	46

Monitoring of IC practice of the RCHEs

Areas of monitoring:

- Placement
- Setting up of donning and doffing areas
- Infection control precaution
- Use of designated medical equipment
- Care of residents with medical device
- Infection control practice of visitors
- Environmental cleansing
- Use of dedicated cleansing tools

ORIGINAL ARTICLE

Role of Hand Hygiene Ambassador and Implementation of Directly Observed Hand Hygiene Among Residents in Residential Care Homes for the Elderly in Hong Kong

Vincent C. C. Cheng, MD;[1,2] Hong Chen, MD;[3] Shuk-Ching Wong, MNurs;[2] Jonathan H. K. Chen, PhD;[1] Wing-Chun Ng, MNurs;[4] Simon Y. C. So, MMedSc;[1] Tuen-Ching Chan, MD;[4] Sally C. Y. Wong, FRCPath;[1] Pak-Leung Ho, MD;[1] Lona Mody, MD;[5] Felix H. W. Chan, MD;[4] Andrew T. Y. Wong, MD;[3] Kwok-Yung Yuen, MD[1]

OBJECTIVE. Multidrug-resistant organisms (MDROs) are increasingly reported in residential care homes for the elderly (RCHEs). We assessed whether implementation of directly observed hand hygiene (DOHH) by hand hygiene ambassadors can reduce environmental contamination with MDROs.

METHODS. From July to August 2017, a cluster-randomized controlled study was conducted at 10 RCHEs (5 intervention versus 5 nonintervention controls), where DOHH was performed at two-hourly intervals during daytime, before meals and medication rounds by a one trained nurse in each intervention RCHE. Environmental contamination by MRDOs, such as methicillin-resistant *Staphylococcus aureus* (MRSA), carbapenem-resistant *Acinetobacter species* (CRA), and extended-spectrum β-lactamse (ESBL)–producing Enterobacteriaceae, was evaluated using specimens collected from communal areas at baseline, then twice weekly. The volume of alcohol-based hand rub (ABHR) consumed per resident per week was measured.

RESULTS. The overall environmental contamination of communal areas was culture-positive for MRSA in 33 of 100 specimens (33%), CRA in 26 of 100 specimens (26%), and ESBL-producing Enterobacteriaceae in 3 of 100 specimens (3%) in intervention and nonintervention RCHEs at baseline. Serial monitoring of environmental specimens revealed a significant reduction in MRSA (79 of 600 [13.2%] vs 197 of 600 [32.8%]; $P < .001$) and CRA (56 of 600 [9.3%] vs 94 of 600 [15.7%]; $P = .001$) contamination in the intervention arm compared with the nonintervention arm during the study period. The volume of ABHR consumed per resident per week was 3 times higher in the intervention arm compared with the baseline (59.3 ± 12.9 mL vs 19.7 ± 12.6 mL; $P < .001$) and was significantly higher than the nonintervention arm (59.3 ± 12.9 mL vs 23.3 ± 17.2 mL; $P = .006$).

CONCLUSIONS. The direct observation of hand hygiene of residents could reduce environmental contamination by MDROs in RCHEs.

Infect Control Hosp Epidemiol 2018;39:571–577

THANK YOU

Acknowledgement

- Staff of RCHEs participating in different programs of CHP
- Colleagues of EHS of the DH
- Colleagues of CNS/CGAT of HA
- Dr. VCC Cheng and colleagues of HKWC
- Dr. NC Tsang, colleagues of CICO office and Hospital ICTs
- Dr. TY Wong and colleagues of ICB/CHP