

Communicable Diseases

WATCH



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FEATURE IN FOCUS

Control of Multi-drug Resistant Organisms (MDROs) in Residential Care Homes of Elderly

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The prevalence of multi-drug resistant organisms (MDROs) is increasing worldwide after the global pandemic of coronavirus disease 2019 (COVID-19). Studies have shown an increase in the rate of infection/ colonisation of methicillin-resistant *Staphylococcus aureus* (MRSA), vancomycin-resistant enterococci (VRE) and carbapenem-resistant Enterobacteriaceae (CRE) during the pandemic¹. In Hong Kong, the number of newly diagnosed emerging MDRO carriers (including CPE, VRE, *C. auris*, VISA, VRSA, MRPA²) planned to be discharged from public hospitals to Residential Care Homes for the Elderly (RCHEs) increased from 339 cases in 2020 to 1,170 cases in 2022, and 1,270 cases in 2023 (as of July 31).

To prevent and control the spread of MDROs in RCHEs, CHP has collaborated closely with various stakeholders to implement and strengthen infection control measures targeting MDROs.

Education, guidelines and training

An annual flagship training programme on infection control has been organised, mainly targeting staff working at RCHEs and infection control nurses since 2005. Each year, expert speakers from various departments and services are invited to deliver talks on topics related to infection control. “Control of MDROs in RCHEs” has been included and remained a popular topic in the programme since 2012. The 2023 annual infection control training took place in June and July, offering both face-to-face and online training sessions. The programme covered various topics, including outbreak control, common infectious disease, annual integrated assessment, infection control advice in the control of MDRO, and improving ventilation. Since 2012, a total of 93 training sessions have been conducted, training over 20,000 RCHE staff members^{**}. Past infection control training materials can be accessed on the Hong Kong Training Portal on Infection Control and Infectious Disease (<https://icidportal.ha.org.hk/>, under “IC Programs”).

CHP produces guidelines on infection control advice for RCHEs. These guidelines include general infection control advice that all RCHEs should adopt and additional infection control measures specifically recommended for residents with MDRO. The guidelines are regularly reviewed and revised to incorporate the latest evidence and reflect the local situation.

(https://www.chp.gov.hk/files/pdf/infection_control_advice_on_mdro_for_rche_eng.pdf).

Visits and assessments

In order to better support RCHEs and assess their adherence compliance of practices to infection control advices, CHP conducts visits to RCHEs on various occasions.

Compliance visits are arranged every 3 to 6 months for all RCHEs with residents who are carriers of emerging MDROs. These visits aim to assess the knowledge and practices of the RCHE staff regarding infection control. During these visits, on-demand refresher training courses are also offered to the staff of the RCHEs.

* Abbreviations: CPE – Carbapenemase-producing Enterobacteriaceae; *C. auris* – *Candida auris*; VISA & VRSA – vancomycin-intermediate/resistant *Staphylococcus aureus*; MRPA – multi-drug resistant *Pseudomonas aeruginosa*

**Training statistics including figures from 2012 – 2022

If a newly diagnosed emerging MDRO carrier to be discharged from a hospital to a RCHE, joint preparation visits with colleagues from the Hospital Authority are arranged based on risk assessment. The aim of such preparation visits is to ensure that the RCHE is adequately prepared to receive the MDRO carrier in terms of both physical infrastructure (e.g. placement of resident, setting up of personal protective equipment donning and doffing areas) and operational aspects (e.g. designated manpower, staff awareness, knowledge and practice). The goal is to prevent the spread of the MDRO within the RCHE. In 2022 and 2023 (up to July 31, 2023), we have conducted compliance visits to 489 RCHEs and preparation visits to 72 RCHEs.

When an outbreak is suspected at an RCHE, CHP would assess the infection control practices of the RCHE to identify any potential lapses in practice and areas for improvement. Infection control advice, especially on the placement and precautions when caring of confirmed carriers and close contacts will be provided to support the RCHEs with an aim to control the outbreak and limit further spread of MDROs in the institution.

Universal decolonisation for MDRO carriers in RCHEs

As one of the priority interventions in the Hong Kong Strategy and Action Plan on Antimicrobial Resistance (2023-2027), a phased programme on universal decolonisation for MDRO carriers in RCHEs was commenced in September 2021. The programme aims to break the cycle of transmission between RCHEs and hospitals. Appropriately 300 RCHEs within the catchment areas of Queen Mary Hospital, Queen Elizabeth Hospital, Princess Margaret Hospital, North Lantau Hospital, Caritas Medical Centre and Yan Chai Hospital are covered by this programme.

The decolonisation regimen involves the use of a 2% chlorhexidine gluconate solution for bathing, following routine practice in RCHEs, and the application of 10% povidone iodine ointment to nostrils once daily, on Monday to Friday, in alternate week. As of July 31, 2023, ICB has conducted 1,176 visits and 325 phone interviews with the participating RCHEs to monitor overall compliance and the progress of implementation. The carriage rate of MRSA and CRA among RCHE residents would be monitored through admission screening in participating hospitals. This monitoring will help track the trend of MDRO carriage among RCHE residents.

Conclusion

The successful control of MDROs in RCHEs relies on close collaboration and joint efforts among different stakeholders, including various government departments (e.g. Department of Health, Social Welfare Department.), public hospitals, healthcare workers, and RCHE staff. The compliance of residents in maintaining good personal hygiene and the support from their family members are also crucial for achieving a synergistic effect in MDRO control. Through education and training, we hope to increase the awareness of MDROs and promote the effective implementation of infection control measures. By concerted efforts, we strive to minimise the risks of MDRO spread and protect the health and well-being of the frail individuals within RCHEs.

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Immunisation Coverage of Vaccines under the Hong Kong Childhood Immunisation Programme - Findings of the 2021 Immunisation Survey on Preschool Children

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Introduction

Under the Hong Kong Childhood Immunisation Programme (HKCIP), the Government provides a number of vaccines free-of-charge to eligible children in Hong Kong¹. The incidence of vaccine preventable diseases in Hong Kong has decreased markedly in the past few decades after the introduction of universal vaccination programmes for children. Maintaining high immunisation coverage is essential for the prevention of vaccine-preventable diseases. The Centre for Health Protection (CHP) of the Department of Health (DH) conducted territory-wide immunisation surveys to estimate the immunisation coverage among children attending pre-primary institutions (PPI). Seven rounds of immunisation surveys had been conducted in 2001², 2003³, 2006⁴, 2009⁵, 2012⁶, 2015⁷ and 2018⁸, covering birth cohorts of 1995 to 2014. The survey results showed that the overall immunisation coverage for vaccines included in the HKCIP was consistently high (above 95%). However, it was noted that children

born or resided outside Hong Kong before two years of age had relatively lower immunisation coverage. A new round of immunisation coverage survey was conducted in 2021, targeting children born from 2015 to 2017.

Method

In 2021, we conducted another round of cross-sectional survey to assess the coverage and timeliness of vaccination for vaccines under HKCIP among preschool children. The study population was children aged three to five (defined as children born between 2015 and 2017) attending PPI in Hong Kong. The subjects were selected by stratified cluster sampling of kindergarten (KG) and kindergartens-cum-childcare centres (KG-cum-CCC). For all the children in the sampled PPI, we obtained written consent from parents/guardians, collected demographic information of their children through a self-administered questionnaire, and collected copies of their immunisation records for vaccination history since birth. We also obtained the children's electronic immunisation record in DH's Maternal and Child Health Centres (MCHCs) for cross checking. We followed up with parents of children with incomplete immunisation records to obtain all relevant documentation.

We calculated the coverage for each vaccine as the proportion of children vaccinated divided by the total number of children with immunisation record submitted. Immunisation coverage was stratified by year of birth (cohort) and local versus non-local children. We defined local children as those who were born in Hong Kong, resided in Hong Kong before two years of age and lived in Hong Kong at the time of the survey. All other children who did not fulfil all the above three criteria were defined as non-local children. Risk ratio of coverage (i.e. ratio of immunisation coverage of local children over that of non-local children) and their 95% confidence intervals (95% CI) among local and non-local children were computed for different vaccines. To study the timeliness of vaccination, we compared the actual age of vaccination with the recommended age of vaccination.

Results

We recruited 25 local and international institutions which covered about 2.4% of the 1,025 preschool institutions with enrolment in the school year 2019/20. Among the 5,076 children attending these 25 institutions, 2,728 (53.7%) responded to our survey. Of these 2,728 respondents, 123 (4.5%) children who were outside target birth cohort between 2015 and 2017 and 40 (1.5%) children who did not submit vaccination record were excluded from the analysis. Overall, 2,565 children were included in the analysis on immunisation coverage. Of these valid respondents, 67.5% and 32.5% attended KG and KG-cum-CCC respectively. 89.6% of them were local children and 53.4% were male (Table 1).

Table 1 – Descriptive characteristics of the survey participants (n = 2,565), Hong Kong Immunisation Coverage Survey 2021

Characteristics		Number of participants	(%)
Year of birth	2015	799	31.2
	2016	946	36.9
	2017	820	32.0
Gender	Male	1369	53.4
	Female	1196	46.6
Birth & residential status*	Local	2297	89.6
	Non-local	268	10.4
Institution type	Kindergarden	1732	67.5
	Kindergarden-cum-CCC	833	32.5
Total no. of participants		2565	100.0

*Local children were defined as those who were born in Hong Kong, resided in Hong Kong before two years of age and lived in Hong Kong at the time of the survey. Children who did not fulfil all the above three criteria were defined as non-local children.

Note: percentage may not add up to 100% due to round off to 1 decimal place.

For children born between 2015 and 2017, except for the third and booster doses of pneumococcal vaccines, the immunisation coverage rates of all vaccines under HKCIP were above 95% (Table 2). The coverage of the second, third and booster doses of PCV were 95.3%, 94.9% and 94.4% respectively, which were slightly lower than the range of 97.7% to 99.6% for other vaccines under HKCIP. This was accounted by the much lower immunisation coverage of PCV (second, third and booster dose) in the non-local children. Local children had higher immunisation coverage (about 99%) than non-local children (about 50-60%) for all doses of PCV, especially for the booster dose (risk ratio = 1.87, 95%CI: 1.61-2.13). With the exclusion of PCV, the overall immunisation coverage among children born between 2015 and 2017 was 96.6%.

Table 2 – Immunisation coverage for vaccines included in HKCIP, of children from birth cohorts 2015-2017, Hong Kong Immunisation Coverage Survey 2021

Type of vaccine	2015 birth cohort			2016 birth cohort			2017 birth cohort			2015-2017 birth cohort			Risk ratio (95%CI)
	Local (n=713)	Non-local (n=86)	Total (n=799)	Local (n=853)	Non-local (n=93)	Total (n=946)	Local (n=731)	Non-local (n=89)	Total (n=820)	Local (n=2,297)	Non-local (n=268)	Total (n=2,565)	Local vs. Non-local
B.C.G.	99.8	100.0	99.9	99.9	95.8	99.5	99.7	96.0	99.3	99.8	97.2	99.6	1.03 (1.00-1.06)
Hepatitis B 3rd dose	99.4	100.0	99.5	99.3	97.9	99.2	99.3	95.9	98.9	99.3	97.9	99.2	1.01 (1.00-1.03)
Polio Booster	98.8	90.6	98.0	98.4	92.6	97.9	97.7	94.8	97.4	98.3	92.7	97.7	1.06 (1.00-1.12)
DTP Booster	98.8	97.7	98.7	98.4	93.8	98.0	97.9	94.9	97.5	98.4	95.4	98.1	1.03 (1.00-1.07)
Measles*	99.8	100.0	99.9	99.2	96.9	99.0	99.2	97.9	99.1	99.4	98.2	99.3	1.01 (1.00-1.03)
Mumps*	99.8	100.0	99.9	99.2	96.9	99.0	99.2	97.9	99.1	99.4	98.2	99.3	1.01 (1.00-1.03)
Rubella*	99.8	100.0	99.9	99.2	96.9	99.0	99.2	97.9	99.1	99.4	98.2	99.3	1.01 (1.00-1.03)
Varicella[^]	99.7	94.3	99.1	99.1	94.8	98.7	99.1	95.8	98.7	99.3	95.0	98.8	1.05 (1.00-1.09)
PCV 1st dose	99.7	76.6	97.3	99.6	85.2	98.2	99.7	91.7	98.8	99.7	84.7	98.1	1.18 (1.12-1.24)
PCV 2nd dose	99.3	52.2	94.3	99.6	60.4	95.8	99.7	62.3	95.6	99.5	58.5	95.3	1.7 (1.49-1.91)
PCV 3rd dose	99.2	51.1	94.1	99.4	56.3	95.3	99.5	61.3	95.3	99.4	56.4	94.9	1.76 (1.54-1.98)
PCV Booster	99.0	46.5	93.5	99.2	52.1	94.7	99.2	60.2	94.9	99.2	53.1	94.4	1.87 (1.61-2.13)
Complete Immunisation[#]	98.4	77.7	96.2	97.9	84.1	96.6	97.6	90.8	96.9	98.0	84.4	96.6	1.16 (1.09-1.24)
Complete Immunisation⁺	97.6	45.4	92.1	97.9	49.0	93.2	97.6	58.3	93.3	97.7	51.0	92.9	1.92 (1.62-2.21)

DTP – Diphtheria, Tetanus and Pertussis

Remarks:

Those with unknown residential status were not included in the above table.

*In Hong Kong, children receive Measles, Mumps and Rubella vaccine according to HKCIP.

[^]Varicella vaccine has been included in HKCIP for children born on or after 1 January 2013.

[#]Excluding PCV

⁺Including PCV

Regarding the place of receiving the vaccines for the 2015 to 2017 birth cohorts, 90.1% of local children received their vaccines in MCHCs, 9.7% received in private practitioners' clinics and other places and 0.1% received in Mainland. In contrast, 54.3% of non-local children received their vaccines in MCHCs whilst 30.9% received them in Mainland, and 14.8% received the vaccines in private practitioners' clinics and other places (Figure 1).

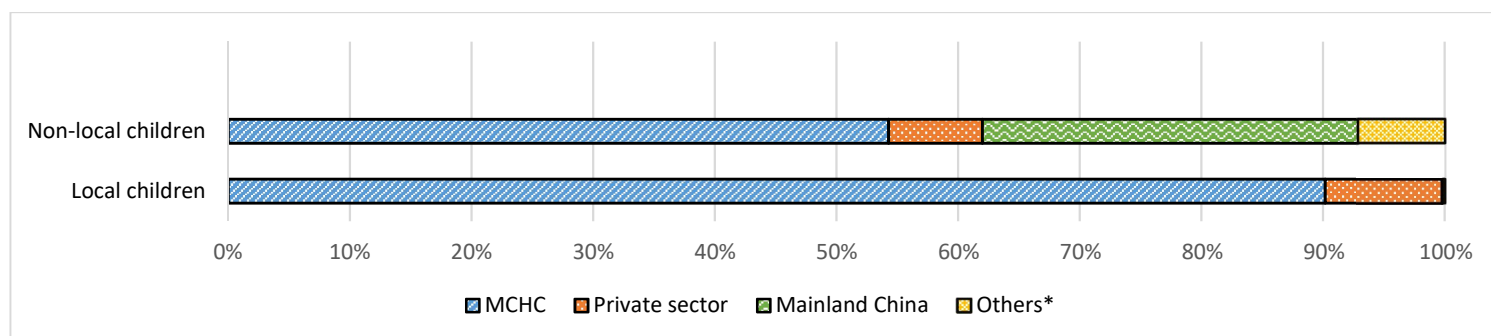


Figure 1 – Descriptive characteristics of the survey participants (n = 2,565), Hong Kong Immunisation Coverage Survey 2021

Footnotes

*Others include those vaccinated at facilities under the Hospital Authority, Macao, other overseas places and unknown. Vaccines received included HKCIP vaccines scheduled before two years of age, except those given at birth (BCG and Hepatitis B 1st dose)

Majority of local and non-local children received vaccines included in the HKCIP according to the recommended ages, except the first dose of PCV and MMR vaccine among non-local children. Regarding the first dose of PCV, local children received the vaccine at the median (range) of time of vaccination at 2.1 (2.1 – 2.2) months. However, among non-local children, one fourth of them received the first dose of PCV at age 16.6 months or older, which was much longer than the recommended age of 2 months.

Subgroup analysis showed that 31.0% of non-local children received only one dose of PCV and all of them received the vaccine beyond one year of age, with the median (range) of time of vaccination at 23.1 (12.3 – 69.6) months. Regarding the first dose of MMR, one fourth of non-local children received the vaccine at 18.5 months or older, suggesting delay in receiving MMR at the recommended schedule under HKCIP of one year old while local children received MMR at the median (range) of time of vaccination at 12.3 (12.2 – 12.5) months.

Discussion

A high coverage for routine childhood vaccines has been maintained in Hong Kong over the years. Local children had higher routine immunisation coverage when compared to non-local children and the difference was most prominent for PCV. With the introduction of PCV into the HKCIP since September 1, 2009, the coverage of PCV among local children has been maintained high since the birth cohort 2009. Similar to previous round, the coverage of four doses of PCV among all non-local children was found to be lower than local children, at a level below 85% in the 2021 survey. Among non-local children who received PCV, subgroup analysis showed that 31.0% of them had received only one dose of PCV, at an age older than one year old. When compared to local children, more non-local children received vaccines in Mainland China (30.9% among non-local children vs 0.1% among local children). Non-local children were less likely to adhere to the HKCIP compared to local children. As PCV is not included in the National Immunisation Programme (NIP) of Mainland China, non-local children who resided in Mainland China before attending PPI in Hong Kong were less likely to complete their PCV immunisation before two years old. In view of this, since July 2019, DH has implemented the catch-up PCV vaccination for children before they are six years old following an updated recommendation on PCV13 catch-up vaccination made by the Scientific Committee on Vaccine Preventable Disease in March 2019. As noted from this survey, quite a significant proportion of non-local children were likely to have been covered by the catch-up PCV vaccination programme.

There are several limitations to the survey. Some parents might not have submitted all the immunisation records (i.e., potential incomplete documentation) such that the immunisation coverage contributed by the vaccines received in places other than MCHCs (e.g. private health sector, Mainland China) may have been underestimated. Secondly, a relatively low response rate for this round of survey was recorded (53.7% as compared to above 75% in previous rounds) which was likely attributable to the difficulties encountered during data collection against the background of COVID-19 pandemic in Hong Kong in 2021 with repeated school closures. In addition, school closures might also have affected willingness of schools to participate in the survey due to administrative difficulties and reduced chance of contacting students in person. Last but not least, with only children attending PPI being sampled, findings from this study may not be generalised to those children who were not attending PPI as early childhood education in PPI is not mandatory.

In conclusion, a high coverage of routine immunisation of HKCIP vaccines has been maintained, and the vaccines were generally received in a timely manner while non-local children had relatively lower documented coverage of PCV. To protect the public from vaccine preventable diseases, medical practitioners / teachers are advised to take note of the findings of this survey and help provide / arrange immunisation for eligible children, especially those who are non-local to ensure the overall high coverage in the community.

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NEWS IN BRIEF

A local sporadic case of leptospirosis

On July 21, 2023, the Centre for Health Protection (CHP) of the Department of Health recorded a local sporadic case of leptospirosis affecting a 54-year-old male with underlying illness. He presented with fever, malaise, myalgia and low urine output on June 25. He was subsequently admitted to a public hospital on July 2 and was diagnosed as acute renal failure. His condition improved with continuous renal replacement therapy and he was discharged on July 10. Paired sera taken on July 4 and July 10 showed a four-fold increase in antibody titre against *Leptospira*. He noticed rodents at the planters in his residential unit. He had not travelled outside Hong Kong during incubation period. His family member remained asymptomatic.

A local confirmed case of human myiasis

On July 25, 2023, CHP recorded a sporadic case of human myiasis affecting an 83-year-old bed-bound man with multiple underlying illnesses living in Wong Tai Sin. He has been staying in a public hospital since December 2022. Maggots were noted in his right upper gum and left posterior auricular region on July 20, 2023. Maggots collected belong to the family Sarcophagidae upon taxonomic examination. The public hospital infection control team, Agriculture, Fisheries and Conservation Department (AFCD), and the Pest Control Advisory Section of the Food and Environmental Hygiene Department were informed for follow-up actions. Pest control measures were enhanced in the public hospital.

Two probable cases of sporadic Creutzfeldt-Jakob Disease and a case of genetic human Transmissible Spongiform Encephalopathies

The CHP recorded two cases of sporadic Creutzfeldt-Jakob Disease (CJD) on July 25 and August 11, 2023 respectively.

The first case affected a 57-year-old man with good past health. He presented with insomnia in September 2022. He later developed dysphagia, rigidity, gait disturbance and akinetic mutism in November. He was subsequently admitted to a public hospital in December. His condition was complicated by sepsis and respiratory failure. Cerebrospinal fluid testing and electroencephalography showed features compatible with CJD. He is currently hospitalised in stable condition. There was no known family history of CJD. No risk factors for iatrogenic or variant CJD were identified. He was classified as a probable case of sporadic CJD.

The second case affected an 80-year-old man with underlying illness. He presented with impaired memory and unsteady gait in June 2023. He was subsequently admitted to a public hospital in July. He was found to have rapidly progressive cognitive impairment, myoclonus, rigidity, dysphasia and akinetic mutism. Findings of electroencephalography and brain imaging were compatible with CJD. He is hospitalised and currently stable. There was no known family history of CJD. No risk factors for iatrogenic or variant CJD were identified. He was classified as a probable case of sporadic CJD.

On August 8, 2023, the CHP recorded a case of genetic human Transmissible Spongiform Encephalopathies (TSEs), affecting a 73-year-old man with history of hyperlipidaemia and ischemic heart disease. He presented with rapidly progressive cognitive impairment and gait imbalance in October 2022. He also developed hypersomnolence and visual hallucination. He was subsequently admitted to a private hospital in December. Cerebrospinal fluid testing and magnetic resonance imaging showed features compatible with CJD. Genetic test showed a pathogenic variant identified in PRNP. He was recently hospitalised and currently stable. He was classified as a probable case of genetic human TSEs.

A local sporadic case of *Streptococcus suis* infection

On August 9, 2023, CHP recorded a sporadic case of *Streptococcus suis* infection affecting an 87-year-old woman with underlying illness. She presented with fever, malaise and confusion on August 1 and was admitted to a public hospital on August 5. Her blood culture grew *Streptococcus suis*. She was treated with antibiotics and remained in stable condition. During incubation period, she visited a wet market regularly and handled raw pork without wearing gloves. She did not notice any recent wound. There was no history of recent travel. Her home contacts were asymptomatic.

A local case of psittacosis

On August 17, 2023, CHP recorded a case of psittacosis affecting a 56-year-old sales woman with good past health residing alone in Sai Kung. She presented with fever, cough and shortness of breath on July 23 and was admitted to a private hospital on August 6 where her chest X-ray showed pneumonia. The bronchoalveolar lavage was tested positive for *Chlamydia psittaci* DNA by polymerase chain reaction on August 16. Her condition gradually improved after antibiotics treatment and she was discharged on August 16. She had no travel history. Investigation revealed that she had visited the bird market on both June 29 and July 2, and bought a parrot from a bird shop there on July 2. Joint visit with the AFCD to the patient's home and the bird market was conducted on August 18. All workers of the bird shop remained asymptomatic.