衞生防護中心
Centre for Health Protection

Antimicrobial Resistance (AMU) Surveillance in Hong Kong - Wholesale Supply Data (2016-2023) Background and Method

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Department of Health

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Background

Background

- The Hong Kong Strategy and Action Plan on Antimicrobial Resistance 2017-2022 (Action Plan) was issued in July 2017. New Action Plan was issued in November 2022.
- Activity 3.1.2 suggests collecting antibiotic supply data from different sectors as proxy to reflect the overall usage and trend of antimicrobial usage.
- Past reports published in CHP website in 2018 (Year 2014-16), 2019 (Year 2014-17), 2020 (Year 2014-18), 2021 (Year 2016-19), 2022 (Year 2016-20), 2023 (Year 2016-21), and 2024 (Year 2016-22).
- The current report is the eighth report and would briefly accounts the surveillance findings for year 2016-2023.
- Since the Action Plan was published in July 2017, the situation of 2016 has been chosen as baseline for comparison.

Method

Scope of Data

- Antimicrobials wholesale supply data from licensed drug wholesalers (ever supplied antimicrobials under monitoring) in year 2023 to the following sectors were included:
  - Department of Health (DH)
  - Hospital Authority (HA)
  - Private hospitals
  - Private doctors (mutually exclusive with Private Hospitals)
  - Dentists
  - Veterinary surgeons
  - Community pharmacies
  - Farmers (who had the Antibiotics Permits issued by the Director of Agriculture, Fisheries and Conservation Department)

Definitions

- Surveillance period is defined by calendar year.
- Anatomical Therapeutic Chemical (ATC) classification
  - This system is developed by the World Health Organization (WHO).
  - It divided drugs into different groups according to the organ or system on which they act and their therapeutic, pharmacological and chemical properties.
- Defined Daily Dose (DDD)
  - A standardised unit adopted by WHO to facilitate comparison of drug usage.
  - Defined as “the assumed average maintenance dose per day for a drug used for its main indication in adults”.
  - Each antimicrobial was assigned a DDD constant per route of administration.
  - DDD constants are updated by WHO annually.
  - The year 2024 version of ATC/DDD (latest version) was adopted in this report.

New Antimicrobials added in ATC/DDD 2024

- The 2024 version of ATC/DDD has been updated to include two antimicrobials, cefiderocol (J01DI04) and eravacycline (J01AA13), for DDD calculation.
- These two antimicrobials have been supplied in Hong Kong in small quantities (<0.005 DID) since 2021 and 2023 respectively. Both antimicrobials have been supplied to public and private hospitals.

ATC Chemical Substance		DID		
Code	Description	Year 2021	Year 2022	Year 2023
J01AA13	Eravacycline	-	-	<0.005
J01DI04	Cefiderocol	<0.005	<0.005	<0.005

- The surveillance results in this report have been updated to reflect the inclusion of these two antimicrobials, with prior years' figures adjusted accordingly.

Antimicrobials monitored

- Following the recommendation of WHO on antimicrobial consumption (AMC)[1], antimicrobials fall under the following WHO ATC classification were collected from licensed drug wholesalers:
  - J01 – Antibacterials for systemic use
  - P01AB – Nitroimidazole derivatives, agents against amoebiasis and other protozoal diseases
  - A07AA – Antibiotics, intestinal antiinfectives
- Antimicrobials which can be administered by the following routes were included, as recommended by WHO:
  - Oral
  - Parenteral
  - Rectal
  - Inhalation
- Preparations for topical use were excluded.

[1] https://www.who.int/publications/i/item/9789240012639

WHO AWaRe Categorisation

- In 2017, WHO introduced the AWaRe categorisation[2] for antibiotic stewardship at local, national and global levels, aiming to reduce antimicrobial resistance.
- The three categories are:
  - Access
    Indicates the antimicrobials of choice for common infections as first- or second-choice empiric treatment options
  - Watch
    Includes most of the "highest-priority critically important antimicrobials" for human medicine and veterinary use. These antimicrobials are recommended only for specific, limited indications
  - Reserve
    Should only be used as a last resort when all other antimicrobials have failed
- Antimicrobials not listed under WHO AWaRe are grouped as "Others".
- WHO encourages countries or regions to aim for 60% or more of the overall AMU to be under Access and to reduce the usage of antimicrobials under Watch and Reserve.
- In July 2023, WHO released the updated AWaRe classification of antibiotics, which has been adopted in this report.

[2] https://www.who.int/publications/i/item/WHO-MHP-HPS-EML-2023.04

Broad-spectrum Antimicrobials (Big Guns)

- The following broad-spectrum antimicrobials are important on treating resistant infections and being monitored in AMU surveillance with HA Dispensing Data. They are examined separately in this surveillance:

  - Piperacillin/tazobactam
  - Ceftazidime
  - Cefoperazone/sulbactam
  - Cefepime
  - Ceftaroline fosamil
  - Ceftolozane/tazobactam
  - Ceftazidime/avibactam
  - Meropenem
  - Ertapenem
  - Imipenem/cilastatin
  - Vancomycin
  - Linezolid
  - Daptomycin
  - Colistin
  - Teicoplanin
  - Polymyxin B

Measurement

- Units used for measurement:
  - Overall quantity of antimicrobials supplied to various sectors: **DDD**
  - Quantity supplied per capita: **DDD per 1,000 inhabitants per day (DID)**, considering the annual mid-year population of Hong Kong
- Calculated measurements:
  - Overall wholesale supply quantity
  - Wholesale supply of antimicrobials by different categories:
    - Distribution by WHO AWaRe categorisation
    - Distribution by Sector
    - ATC Pharmacological Subgroup
    - The 10 most supplied antimicrobials
  - Wholesale supply quantity of selected broad-spectrum antimicrobials

* The year 2024 version of ATC/DDD was adopted in this report.

Statistical Method

- The year 2016 was chosen as the baseline for comparison as the Hong Kong Strategy and Action Plan on Antimicrobial Resistance 2017-2022 was issued in mid-2017 and this decision was endorsed by the High Level Steering Committee (HLSC).
- Following the ECDC, Compound Annual Growth Rate (CAGR) were used to illustrate the average annual rate of change when comparing antimicrobials dispensed in 2023 with those in 2016.

$$\mathrm{CAGR} = (SU_{2023}/SU_{2016})^{(1/7)} - 1$$

- In this equation, SU_{2023} represents the total amount of antimicrobials supplied in the year 2023, and SU_{2016} represents the total amount of antimicrobials supplied in the year 2016.

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THE END

Thank you

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