NAUSP Portal
User Guide

Version 4.0

National Antimicrobial Utilisation
Surveillance Program (NAUSP)

March 2025

**Government
of South Australia**

SA Health

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Contents

1. Glossary

Term	Definition
ACSQHC	Australian Commission on Safety and Quality Health Care
AHPRA	Australian Health Practitioner Regulation Agency
AIHW	Australian Institute of Health and Welfare
AMS	Antimicrobial stewardship
antimicrobial	Antibacterial, antiviral, antifungal or antiparasitic
ATC	Anatomical Therapeutic Chemical
AURA	Antimicrobial Use and Resistance in Australia
contributors	Hospital or healthcare facilities participating in NAUSP
DDD	Defined daily dose
denominator	Specific patient activity metrics
DHW	Department for Health and Wellbeing, SA Health
dispensing report	Output of a report of antimicrobial dispensing by month by hospital
eMAR	Electronic Medication Administration Records
external users	Users of the NAUSP Portal other than the NAUSP administration team
HDU	High dependency unit
ICU	Intensive Care Unit
LHN/LHD	Local Health Network/District
MA	Moving average
NAUSP	National Antimicrobial Utilisation Surveillance Program
Non-ICU	Any hospital ward/s except ICU/HDU
numerator	Antimicrobial usage
OBD	Occupied bed days
Other non-ICU	Any hospital ward/s except those assigned to ICU, or another NAUSP Specialty
patient activity metrics	Occupied bed days, emergency presentations, theatre cases, patient days
peer group	Hospitals grouped together for comparison of data
QA	Quality assurance
SA	South Australia
WHO	World Health Organization

2   About this guide

This guide is intended for use by pharmacists or other approved users at healthcare facilities that contribute to the National Antimicrobial Utilisation Surveillance Program (NAUSP).

NAUSP is administered by the Department for Health and Wellbeing, SA Health, and is funded by the Australian Government Department of Health and Aged Care for contribution of data to the Antimicrobial Use and Resistance in Australia (AURA) project. The program allows national comparison of antimicrobial usage rates within healthcare settings and contributes to ongoing improvement of antimicrobial stewardship initiatives and activities.

NAUSP reports on antimicrobial utilisation in Australian **adult inpatient** settings. An additional surveillance stream to include paediatric populations is currently undergoing extensive methodological testing. Epidemiological analysis of antimicrobial usage is provided, facilitating awareness of environmental pressures for selection of resistant organisms within healthcare facilities.

Data are provided by contributor facilities through submission of monthly antimicrobial usage data and patient activity metrics for compilation and processing within the NAUSP database.

To facilitate comparisons between contributors' antimicrobial usage, the data are converted to a standardised usage density rate for each agent:

- Usage rates are expressed according to the source of usage data:
  For **pharmacy distribution** data, rates are defined as number of Defined Daily Doses (DDDs) used per denominator; either 1000 occupied bed days (OBDs) or number of presentations (for Emergency Department and Operating Theatres/Recovery). The DDDs are an internationally accepted metric developed by the World Health Organization (WHO) for epidemiological investigation of medication usage.

- For **electronic medical administration record** (eMAR) data, rates are defined as the number of Days of Therapy (DOTs) used per 1000 patient days (PDs). Days of therapy is a metric that allows inclusion of paediatric patients, where DDDs are not applicable, and the dose administered does not form part of the methodology.

3 NAUSP Helpdesk

If you are unable to resolve an issue with the information provided in this guide or other documents on the NAUSP website, please email the NAUSP Helpdesk (Health.NAUSPhelp@sa.gov.au) for assistance. NAUSP will endeavour to address all email enquiries within two business days.

If your enquiry requires urgent and immediate attention, please phone the NAUSP Helpdesk on (08) 7425 7168.

4 Getting started

4.1 Access

Access to the NAUSP Portal (displayed below) is available via the NAUSP Portal home page.

The NAUSP Portal is intended for use by pharmacists or other approved users at facilities that contribute to the program, and those using the NAUSP Portal to upload antimicrobial usage data and access NAUSP reports.

4.2 Technical requirements

The NAUSP Portal is a web-based interface. To use this Portal you will need access to:

> A secure internet connection

> Microsoft Excel 2007 or above – data files to be uploaded must be able to be saved with the **.xlsx** suffix

> The latest version of one of the following internet browsers:

- Google Chrome (preferred option); or
- Mozilla Firefox (preferred option); or
- Microsoft Edge

The system is not guaranteed to be fully functional in outdated versions of browsers, or browsers not included in this list. The Portal is not optimised for mobile use.

4.3 User registration (existing facility)

4.3.1 Australian Health Practitioner Regulation Agency (AHPRA) registration

To register as a NAUSP user you must have a current AHPRA registration number. If you are not a registered health practitioner please contact the NAUSP help desk to obtain a substitute number. Each AHPRA registration number can only be used once for the health practitioner to whom it is assigned.

4.3.2 Health facility email address

Please ensure that you register with the email address associated with your primary place of employment. All activity within the NAUSP Portal is linked to this email address, including data loading and extracting. For ease of auditing (where required by the NAUSP Team), please ensure you do not register with a shared email address. Once set, this email address cannot be edited. (For change of email, please see 4.8 Maintain user account details). Generic, shared departmental, private and non-secure email addresses (e.g. Hotmail, Gmail, Bigpond etc.) will not be accepted.

You should only select healthcare facilities for which you have permission to submit data and extract reports. Any requests for hospitals you are not authorised to access will not be approved.

4.3.3 Terms and conditions

By completing your registration and using the NAUSP Portal, you agree to maintain the confidentiality of the NAUSP data for your facility and to notify SA Health when access is no longer required. You also agree that you understand that SA Health will remove your access to this site and its data on written request from an authorised executive representative of your facility.

Ownership of raw data submitted to NAUSP remains with the health facility or Local Health Network (LHN) / Local Health District (LHD) from which the data are supplied.

4.4 User registration (new facility)

If your health facility cannot be found in the drop-down list, please complete your personal details (as per 4.3 User registration (existing facility)) then select *Register New Hospital* to register a new contributor facility. Please ensure all tabs are completed to the best of your knowledge; this information may be edited once your registration has been finalised.

If your facility is new to NAUSP there are several steps that must be completed before approval is given to commence submission of data. A summary of these steps can be found in the [New Contributor Checklist.](#) Once you have registered an interest in your facility joining NAUSP by applying for Portal access, the NAUSP team will make contact with you to provide further information regarding completion of your facility's registration. A Participation Agreement requiring written consent from executive (or delegate) of your organisation to join the program will be supplied to you by the NAUSP team during this process. Your facility may already be included in existing local health network or jurisdictional agreements with NAUSP.

4.4.1 Contact details

Enter the contact details of your health facility. Once submitted and accepted, NAUSP will assign any applicable Local Health Network (LHN) / Local Health District (LHD), Australian Institute of Health and Welfare (AIHW) Peer Grouping, and other relevant benchmarking groups.

4.4.2 Datatype (pharmacy distribution or eMAR)

Submission of data extracted from eMAR is not yet available

You must select the way you will contribute your facility's usage data to NAUSP – granular (by ward or location) or total-hospital. Please see [5 Granular data submission options](#), for a more detailed explanation. This selection can be edited once your registration is finalised.

4.4.3 Demographics (bed numbers)

Enter your facility's demographic information by ward/specialty. If you are unable to enter definite numbers, an estimate will be adequate. This information assists NAUSP by creating a profile of your site. It does not affect data submission or reporting, but provides additional context for national reports and other statistical analyses.

4.4.4 Services

Please indicate what clinical services are offered by your facility. This information does not affect data submission or reporting but provides additional context for national reports and other statistical analyses.

4.5 New user account approval

When your registration is confirmed and approved by NAUSP, you will receive an email directing you to the NAUSP Portal to set a password and complete your registration. The token in this email is valid for 24 hours; if you miss this window, please email the NAUSP Helpdesk to request the email be resent.

Security guidelines state that passwords must be at least eight characters in length, including:

> one alpha character

> one numeric character

> one non-alphanumeric character

> one uppercase character

> one lowercase character

4.6 New user account rejection

Reasons your registration request may not be approved include:

> the email provided is not associated with a facility that contributes to NAUSP

> your AHPRA number is not able to be verified

> the email address or AHPRA number is already in use for a NAUSP account

> the email address provided is not valid (e.g. contains a typographical error)

> you are not associated with AMS activities at the health facility you have requested access to

4.7 Password recovery

If you have forgotten your password, click on the *Forgotten your password?* link from the log-in page and enter your registered email address. You will then receive a system-generated email prompting you to reset your password. The token in your password reset email will expire 24hrs after delivery, please ensure you action it promptly.

If you do not know the email address you initially registered with, or it has changed, please email the NAUSP Helpdesk (Health.NAUSPhelp@sa.gov.au) for further assistance.

4.8 Maintain user account details

In the event of changes to your name, position title or phone number, you can update your NAUSP account details via *Maintain My Details* under the drop-down menu in the header bar. You may also request access to additional hospitals; changes will not immediately take effect as they must first be approved by NAUSP. Changes to user email addresses may be allowed in some circumstances at the discretion of NAUSP. Please contact the team to discuss your request (e.g. change of name).
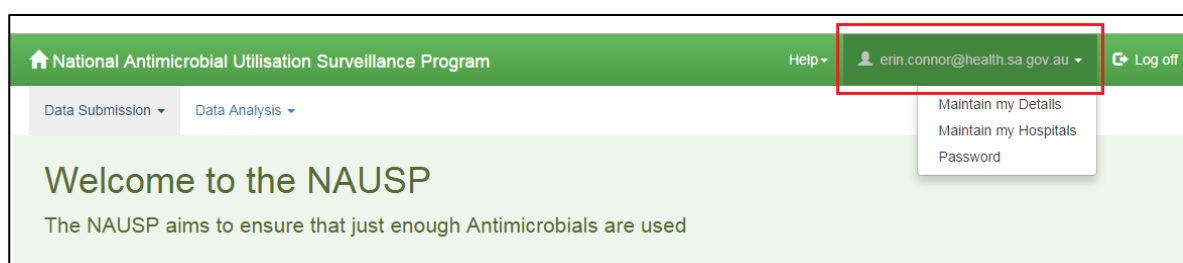
4.9 Maintain health facility details

If you need to update your facility's details, you can edit information via *Maintain my Hospital*s under your user profile in the drop-down menu in header bar. For more detailed information regarding submission of granular data (e.g. by ward/location), please see 5.1 Submit data by acute ward/location.

4.10 User account deactivation/re-activation

If no activity in the NAUSP Portal is registered for six (6) months (i.e. you have not logged in to the NAUSP Portal during this time), your account will automatically be deactivated. You will receive a system-generated email prior to this being finalised; if you wish to maintain access, simply log in to the Portal to re-set.

You may also choose to deactivate your NAUSP account (for example, if you are going to be absent from work for an extended period) by editing your NAUSP account detail. Simply click the *Deactivate Account* link via *Maintain my Details* under the drop-down menu in header bar.

To re-activate your NAUSP account, click on the *Request reactivation of a deactivated account* link on the Portal landing page and enter the email address you had previously used to register with NAUSP. If you do not know the email address you initially registered with, or it has changed, please email the NAUSP Helpdesk (Health.NAUSPhelp@sa.gov.au).

4.11 Governance within your facility

It is recommended that your NAUSP data submission and reporting activities are overseen by a governance group within your facility (such as your AMS Committee). Each facility is encouraged to develop a local standard operating procedure to assist future-proofing ongoing data submission.

5   Granular data submission options – Pharmacy distribution data

NAUSP has the capacity for healthcare facilities to submit and report data by total usage or by selected wards/locations within the facility. Definitions of minimum requirements to report data from wards or discrete locations are provided in the NAUSP Data principles and definitions document. The areas for which data may currently be submitted include:

Acute-care wards/locations

> Critical care (incorporating Intensive Care Unit (ICU) and High Dependency Unit (HDU))

> Theatre and recovery

> Emergency Department

> Haematology/oncology

> Obstetrics/gynaecology

> Respiratory

> Other/unspecified acute

Subacute-care wards/locations

> Hospital in the Home

> Rehabilitation

> Mental health

> Palliative care

> Aged care (care awaiting placement/on-site higher-level care)

> Other/unspecified subacute

In addition, sites may submit data by "total-hospital" if they do not meet the requirements for submitting under any of the areas above. If electing to submit by ward/location, any data that does not qualify for the chosen areas must be captured/submitted "other/unspecified acute" (or subacute); this will ensure usage in all wards except those covered by your chosen areas is captured. Refer to Sections 5.1 and 5.2 for further explanation of these data submission options.

5.1 Submit acute data by ward/location

This option is for contributors that can extract data for at least one of the following areas: Critical care (incorporating ICU and HDU), Theatre and Recovery, Emergency Department, Haematology/Oncology, Obstetrics/Gynaecology, or Respiratory. To utilise this feature, you must be able to provide both numerator and denominator data (i.e. antimicrobial usage and patient activity measures) for at least one of these specific wards/patient groups. Your hospital does not need to have all areas offered to select this option (i.e. you may select just one location in addition to *Other/unspecified acute*). If you can provide stratified data for Emergency Department and/or Theatre/Recovery, these areas **must** be selected. Usage from these two locations cannot be submitted under Other/Unspecified Acute due to the different denominator type used (presentations not occupied bed days). Please discuss with the NAUSP Team if required.

Contributors that elect to submit granular data can extract reports with comparator data drawn from the same ward/location use in other facilities, total-hospital acute usage, or combined acute or subacute usage. For more information on the reporting functionality of the NAUSP Portal, see Section 9 Reports.

5.2 Submit data by total only

This option is for contributors who cannot differentiate antimicrobial usage by specific wards/locations outlined above, or who do not meet the minimum NAUSP requirements for submitting granular data. These sites will only be able to run total-hospital usage reports, whereby all usage is pooled together. This method is suitable for smaller sites, such as those classified as AIHW Public or Private Group C or D, or where antimicrobials are distributed to one common imprest or cost centre. While limited benchmark rates are available for these total-hospital 'unstratified' datasets, sites can still monitor their usage over time to observe trends and gain useful insights.

6   Uploading data to the Portal – Pharmacy distribution data

Please ensure that each time you prepare to submit to NAUSP that data are compliant with program rules. Denominators must align with drug usage from NAUSP-defined included wards/locations (and vice versa). As NAUSP data are currently determined from pharmacy dispensing and distributions to wards it is important to keep up to date with changes in your facility (including new wards, ward closures, renovations etc.). Please ensure that, where possible, datasets reflect adult inpatient usage only.

Data submissions should be made monthly. Any contributor that has three or more months' data outstanding may have data extraction activities (rate calculation and report generation) restricted as NAUSP prepare periodical national reports/extractions. Access is generally restored once data submission has resumed and is up to date.

The two key files you need to prepare and maintain to submit data to NAUSPare:

> NAUSP Antimicrobial Usage data Excel file (monthly submission file)

> Denominator Record

6.1 Data preparation – antimicrobial usage

6.1.1 Dispensing report/extraction from site software

Drug usage data are to be extracted monthly according to the NAUSP Data principles and definitions and include all antimicrobial agents (all routes) used within your facility. (Refer also to the comprehensive list of agents as outlined in the document Antimicrobial agents included in NAUSP reporting.) We recommend including as much detail in your data extraction as possible, such as ward/cost centre, to assist with location-specific reporting and NAUSP quality assurance processes. Please ensure product descriptions are complete, including strength and pack sizes where appropriate (e.g. topical creams, drops).

It is advisable to include NAUSP submissions in your end-of-month house-keeping procedures. Please ensure you extract raw drug usage data for the correct month; there is no mechanism for NAUSP to confirm the correct data have been extracted by a user from their local software (e.g. dispensing system) to populate the upload template for any given month.

For further details relating to NAUSP methodology, see NAUSP Data principles and definitions.

*Please remember to include only inpatient use as defined by NAUSP definitions and ensure drug usage is supplied as **units** (i.e. number of tablets/ capsules/ vials/ tubes/ bottles) not packs. All liquids must be in number of bottles, not millilitres.*

Once you have your raw data for the month, it can be transferred to the NAUSP template. For an example of how to extract usage from iPharmacy® see Appendix 3 - Example of how to extract NAUSP data from iPharmacy®.

If your dispensing reports are unable to distinguish **discharge supply** from inpatient use, a separate discharge report should be generated so it can be subtracted later.

If **clinical trial antimicrobials** are administered at any time within your facility, please contact the NAUSP team regarding inclusion in monthly submissions. These will be addressed on a case-by-case basis.

Historically, NAUSP has discarded outsourced **elastomeric infusions** (e.g. those manufactured by Baxter®/Slade®) on the assumption that they are administered outside the hospital (e.g. hospital in the home (HITH)). Now that HITH is part of the program it is important that we capture these products if your hospital has registered to submit HITH data.

Likewise, if your facility uses such infusions for inpatients of included wards or areas, they should **not** be removed, and instead added to the submission.

PLEASE NOTE: Variable dose infusions dispensed as "Xmg/YmL" will be aliased to a 1mg product – please edit the quantity of these lines to reflect the **total number of milligrams** dispensed.

Pre-packed products (such as those dispensed to Emergency Departments and labelled "PP", "EP" or equivalent) are included in NAUSP data definitions. Prepacked antimicrobials are reported separately (similary to ED and theatre) and do **not** form part of routine reporting.

If pre-packs are distributed for inpatient use and should be captured in acute usage surveillance, please remove the annotation or add "inpatient" to the product description. If these products are supplied on discharge or for off-site use, please ensure the product line is appropriately annotated for ease of identification. From 2024, all pre-packed antimicrobials will be accepted in surveillance datasets and their

Preparing the NAUSP Antimicrobial Usage Data is a useful video guide on how to prepare antimicrobial usage data for upload.

6.1.2 Use of NAUSP antimicrobial usage template

The usage data submission template is available for download from the NAUSP Program Documentation page. Use of this template is the only accepted method of data submission to the Portal. Completion of cells B1-3 and columns B, C and D is mandatory (from Row 8 and below); these are shown as green highlight in the figure below. Entering a ward description or cost centre is highly encouraged to ensure areas of drug usage captured align with bed occupancy data and wards/locations. Please ensure that only the first tab of the workbook is in use; do not add other data (e.g. OBDs for the same month) to subsequent worksheets or edit the tab's name.

	A	B	C	D
1	**Facility Name**			
2	**Year (yyyy)**			
3	**Month**			
4				
5				
6				
7	**Ward description**	**NAUSP Ward/Location**	**Product description (name, strength, form, pack/liq qty/ml)**	**Quantity**
8				
9				
10				
11				
12				
13				
14				

How to complete the template:

Type your facility name <u>exactly</u> as it appears in the NAUSP Portal. Saving a template with this information already entered may save time for future data submissions.

If there is any doubt, you can copy and paste your facility name from the *Maintain my Hospital* page within the Portal.

You can also copy the facility name from the Submission Parameters box at the Load screen, along with verifying the correct file naming convention for your Excel file.

If there are any errors in cell **B1**, your data upload will not be successful. Enter the year in cell **B2** (four figures long) and select the correct month (three characters long) from the drop-down menu in cell **B3**.

Ward description (or short code/cost centre) is not mandatory for successful data upload, however we strongly encourage you to complete this column to facilitate cross-checking of numerator and denominator inclusions/exclusions for quality assurance (QA) activities. Populating the ward description column will also allow you to easily apply the relevant specialties.

The **NAUSP Ward/Location** column must be populated with only those areas for which you are registered to submit data. This is the stage of data preparation where you can stratify and "map" your usage by ward/location/cost centre to the applicable NAUSP location.

If you are unsure about which areas your facility is registered for, consult the *Datatype (Pharmacy or eMAR)* tab within the *Maintain my Hospital* menu. You will also see these areas displayed on the Load screen. If you attempt to upload data for a ward/location you are not registered for, you will receive an error message and be prevented from uploading your drug usage file.

The NAUSP wards/locations entered into Column B must match what they are called in the Portal. If there is a mismatch, this will be displayed in an error box if your load fails. If needed, you can highlight and copy/paste the Ward/Location names as they appear on the upload screen, as shown in green in the screenshot above.

Data submission method	How to complete NAUSP Ward/Location column
Ward/Location (acute and subacute)	Type (or copy and paste) each required ward/location exactly as it appears in the Portal. Any discrepancies will prevent the data from being uploaded. The areas available for upload will be listed in the monthly file submission window. Only wards/locations registered against your facility will be allowed to be submitted. Any extras/omissions will first require edits to *Maintain my Hospital* (Datatype). Data from areas not assigned to a specific ward/location should be assigned 'Other/unspecified' (either acute or subacute) in the NAUSP Ward/Location column.
Total-hospital only	All entries must be assigned **Total.** This represents data that is unable to be stratified and may include stock distributions to Emergency or Theatre from one central imprest/supply.

Product description must include the name (or brand), strength and form of the drug, and volume (if it is a liquid formulation), weight (e.g. tube size as number of grams), or pack size.

If your raw data report does not place the drug name, strength and form within the same cell, you will need to **concatenate** the cells that contain this information (i.e. knit this information together). For instructions on how to do this, please refer to Appendix 1 – *How to concatenate cells.*

Quantity relates to the number of units, not number of packs used. If your dispensing reports generate pack data (e.g. FRED® reports or any pre-packed antimicrobials) these must be converted to units **before** submission. Only numerical quantities are accepted. Any part-packs or decimals will be rounded up to the nearest integer.

If **discharge data** are captured within the monthly usage extraction, please *add* (paste) these rows of data to the end of the drug usage data and multiply each number in the quantity column by -1. This will ensure antimicrobials dispensed on discharge are subtracted from the monthly inpatient antimicrobial usage.

NB – only carry out this process if what is included in your discharge report also appears in your total usage report – we do not want to subtract it twice and under-report usage.

6.1.3 Formatting/reviewing data

Once populated with data from the drug usage/dispense report, this template should provide an accurate reflection of adult inpatient antimicrobial usage for the month.

> *A tip from the NAUSP team: When you are ready to transfer your data into the NAUSP data upload template, sort your antimicrobials by Ward Description (Column A) and use the filter and "fill down" functions in Excel to populate Column B. Creating a reference table with the wards included in your submission and their corresponding NAUSP locations may assist your upload process.*

Scroll through your data spread sheet to verify:

> \> All data intended for inclusion are listed in Columns B, C and D

> \> Ward/location names in Column B appear with the same wording as displayed in the NAUSP Portal.

> \> Only the first tab of the Excel spreadsheet contains data – do not add any sheet or content onto Sheet1 as this will prevent successful loading. Please do not edit any sheet names.

6.1.4 Saving your data file

When you have finished populating the NAUSP template and are satisfied that it is correct, please ensure that the file is saved with the following naming convention:

_Facility_YYYY_MM_

> \> Facility (code is the 3 or 4 letter code assigned by NAUSP)

> \> YYYY (4 digit year)

> \> MM (2 digit month)

Your hospital code will be displayed in the File Upload screen as the expected filename; please contact the NAUSP team if you are unsure. If this naming convention is not adhered to, you will receive an error message when attempting to upload the file.

It is recommended you keep a copy of the Excel files you submit for up to two years in the event an error is discovered in your data and requires re-submission.

6.2 Data preparation – OBDs and presentation/case numbers

Occupied Bed Days (OBDs) are used as the denominators for the program's statistical analysis on antimicrobial usage rates in all wards/locations **except** the Emergency Department (ED) and theatre & recovery (OT), where number of presentations and number of cases are used respectively. If you are <u>not</u> submitting data by ward/location (i.e. you are reporting total unstratified hospital usage data) OBDs are the default denominator type.

Monthly patient activity metrics should be obtained from patient services or case mix (depending on your facility) according to the NAUSP data principles and definitions. The mechanism for accessing reporting

may vary between sites. You may need to seek permission from your Clinical Analytics team (or equivalent) to access this data. Your Chief Executive's signed approval for contribution of data to NAUSP provided agreement that necessary data would be supplied to NAUSP consistently.

We recommend maintaining a spreadsheet that outlines monthly denominators by **ward/location** or **cost centre** (as exported by your dispensing software). The areas included in your denominator record sheet should loosely match those in the NAUSP Antimicrobial Usage data Excel file. As you are entering your denominator data into the Portal, it is good practice to compare the current month denominator/s to previous months' figures. Checking they are consistent, or that there is a known reason for major discrepancies such as a ward closure, can help avoid errors and unnecessary time reloading submissions in the future.

Our suggested template for denominators can be downloaded from the *Related resources* section of the NAUSP Portal Home page. An example of an acceptable format can be found in Appendix 2 – OBD template. When your data are requested for NAUSP Quality Assurance and audit purposes, NAUSP will need to easily identify which wards have been included or excluded from your submission and match this with drug usage data. Keeping track of ward movements or closures on this Excel spreadsheet may assist with this process. Our Preparing the NAUSP Denominator Data video will help to guide you through this process.

6.3 User data upload

To access the data submission area of the Portal, click on *Submit Data* under the Data Submission menu from the NAUSP homepage. The most recent month available for upload will be displayed for the hospital/s for which you have access, with any overdue submissions highlighted for your attention. A drop-down menu allows you to select previous months. Click on *Upload* for the facility you wish to submit data for that month. Before you commence this step, you should have your denominator data and your Excel NAUSP Antimicrobial Usage data file prepared.
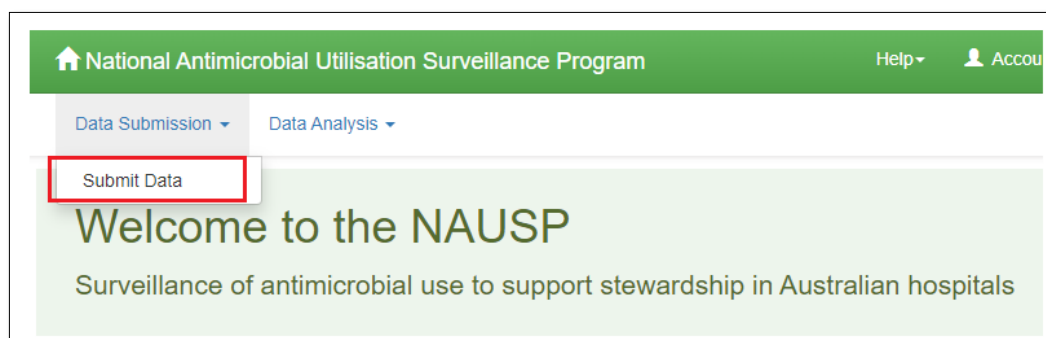
6.3.1 Upload data

Drug usage and denominator data are submitted by month in one step. If your facility submits data by ward/location, you will be required to enter the denominator figure for each stratified area separately, along with the remaining other areas as a **combined** figure. You can only submit data for areas for which you have been approved. If for some reason one location has not registered any activity for the month (e.g. obstetric services or surgery on hold during the Covid-19 pandemic), a zero-denominator entry will be accepted.

If a ward/location closes or you no longer wish to submit stratified data in this manner, please contact the NAUSP Team.

To **upload drug usage**, click the *Browse* button to select the required file from your computer. Please double check that the month and hospital code match the submission request and click *Upload File* to continue.

For successful upload, all denominator and drug usage file fields must be filled prior to clicking *Upload File*. If any are missing, you will receive an error message.

Upload NAUSP Pharmacy/Dispensing Data

Enter Denominator Data and choose a NAUSP data file for the submission

Submission Parameters   ✕
- **Seattle Grace Test Hospital**: submission for **01/2022**
- Expected filename is **SEA_2022_01.xlsx**

Ward/Location	Denominator	
Critical Care (ICU/HDU)		OBD
Haematology/Oncology		OBD
Other/Unspecified acute		OBD
Theatre and Recovery		Theatre cases
Emergency Department		ED pres.
Mental Health		OBD
Other/Unspecified subacute		OBD
Aged Care		OBD

Select a file to import

no_file_selected.xlsx   Browse

                                              Cancel   Upload File

You will be shown a summary of data extracted from your upload file. Records that will be uploaded will be highlighted in green and will have a tick in the check box. Scroll through the **entirety** of the summary submission to review all records. The number of rows will be the same as in the uploaded Excel file, with any additional warnings at the end of the page.

A tip from the NAUSP team: Scroll through your submission summary and cross reference the last product matches the last product on your upload template.

Upload NAUSP Data
Summary of data to be stored extracted from uploaded file

> Submission Parameters   ✕
> - **Seattle Grace Test Hospital**: submission for **01/2020**
> - Expected filename is **SEA_2020_01.xlsx**

<div align="right">[Upload Data]</div>

	Specialty	Antimicrobial	Quantity
✔	Emergency Department	ACICLOVIR 250mg INJ	10
✔	Emergency Department	ALBENDAZOLE 200mg TABCHEW	6
✔	Emergency Department	AMOXICILLIN 1g TB	56
✔	Emergency Department	AMOXICILLIN 500mg CP	140
✔	Emergency Department	AMOXICILLIN/CLAVULANIC ACID 500mg/125mg TB	50
✔	Emergency Department	AMOXICILLIN/CLAVULANIC ACID 875mg/125mg TB	190

Records that cannot be uploaded will be highlighted in red and will not have a tick in the check-box (e.g. missing location/product name/quantity in Excel file). Cancel the upload, amend the usage file as needed, and restart your submission.

✔	Critical Care (ICU/HDU)	LINEZOLID 600mg/300mL INF	10
☐	Critical Care (ICU/HDU)		70
✔	Critical Care (ICU/HDU)	MEROPENEM 500mg INJ	30
✔	Critical Care (ICU/HDU)	METRONIDAZOLE 400mg TB	21
✔	Critical Care (ICU/HDU)	MOXIFLOXACIN 400mg/250mL INF	2
☐	Critical Care (ICU/HDU)	NYSTATIN 100,000 iu/mL (24mL) SUSP	72ml
✔	Critical Care (ICU/HDU)	OSELTAMIVIR 30mg CP	13

This summary will also alert users to any wards/locations that a site is registered for, but for which no data has been included in the submission. This may be relevant for smaller sites that do not have regular theatre usage, or if areas flex up/down seasonally.

Click *Upload Data* to confirm or *Cancel* to exit and edit the dataset for resubmission.

Once uploaded, the database will sort the uploaded data into wards/locations, according to those assigned in Column B of the NAUSP data upload template sheet, for final review and submission.

See the video Uploading the Data to the NAUSP Portal for step-by-step details.

6.3.2 Submit data

Once a file is ready for processing, the *Submit Data* page lists warnings and errors for consideration before submitting the data. Data are grouped by ward/location (shown in green) with four sub-menus (shown in red in the example below) per area. Please work through **each** location to review the data submitted.

Working through these tabs, you can review (see also 10.1 Data validation processes when loading data):

> **Unknown antimicrobials** – the NAUSP team will review and determine whether new aliases are needed. Please double check that any products flagging as unknown include all necessary components – active ingredient/s, dose/strength, form and volume where applicable). You can continue to submit your data and the NAUSP team will review once data are submitted.

> **Discarded Antimicrobials** – records that are being discarded according to program rules.

> **Usage Warnings** – e.g. records that have warnings caused by statistical anomalies (less than 50 or greater than 200 percent of preceding 12 months average quantities).

> **Submission Summary** – a summary of all data to be added to the NAUSP database for the selected ward/location (Note: antimicrobial quantities are summed and appear in alphabetical order).

In the example below, an oral liquid has been submitted as millilitres instead of number of bottles. This will require amending the raw data file and resubmitting.

It is important to work through all wards/locations and each sub-menu (particularly Usage Warnings) prior to clicking the *Submit Data* button. If you are satisfied with the warnings, submission summary, unknown and discarded antimicrobials then proceed by clicking the *Submit Data* button.

If you believe there is an error in the data, you can cancel and re-upload the file after the error has been corrected (see Section 6.3.3 Re-upload data below).

The final screen in the loading process is a summary of Usage Warnings (if there are any) across the entire submission, including denominators that fall outside normal or expected ranges.

6.3.3 Re-upload data

The NAUSP Portal will allow you to delete and update (re-load/override) existing data prior to submission (if you make an error), and up to **10 days from the original submission date**. After 10 days, the submission becomes locked for editing by NAUSP and you are no longer able to make any changes. Should you need to re-load any submission beyond the 10-day timeframe, please contact the NAUSP Helpdesk (Health.NAUSPhelp@sa.gov.au).

To reload a submission, you must first delete the file that is to be reloaded by clicking the 'x' beside the required file (as demonstrated in the example below). You can also view a summary of data loaded for each month (via *Remove*) from this screen.

If your file is at the *Complete* stage, you will need to enter a reason for deleting data (e.g. wrong month uploaded, error in data extraction etc.)
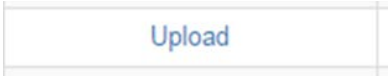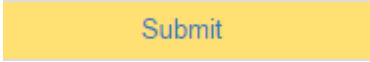
The status of the submission will change from *Complete* to *Upload*, and you can start again.

6.3.4 Load data status meanings

Status	Meaning
Upload	No data has been uploaded yet for the contributor, location and month.
Submit	A data file has been processed but not yet submitted to the NAUSP database for the contributor, location and month.
Complete	Data has been processed and submitted for the contributor, location and month.
NAUSP Team Review	Unknown antimicrobials need attention from the NAUSP team. The NAUSP team will complete the upload.

7 Rate calculations

Rate calculations provide additional functionality over traditional NAUSP reports and allow Portal users to analyse their antimicrobial usage both at a local level, and in comparison, to other similar facilities, to assist with local AMS activities. Rate calculations can be run for any antimicrobial that NAUSP collects data for (see Antimicrobial agents included in NAUSP reporting) at a formulation, agent and class level. The resultant rate calculation will provide usage of your selected antimicrobial(s) in an Excel spreadsheet, stratified or aggregated according to location/s, along with the aggregated usage of your selected comparator group(s).

You will find the option of running rate calculations under the *Data Analysis* menu from the NAUSP Portal homepage. This function is used to examine antimicrobial usage rates for trend analysis, benchmarking and for quality assurance processes. Additionally, data for antimicrobial classes and/or agents that are not included in the standard NAUSP reports may be selected. An enhanced feature available to external users of the Portal is the ability to extract aggregate data (in the form of a rate calculation) from multiple comparators.

> *Please note - Rate calculations return tabular data in an Excel file that you can then use to create your own charts.*

Rate calculations can be saved for re-use amongst registered users of the same facility.

7.1 Create a new NAUSP rate calculation

To create a new rate calculation, set the parameters per your requirements.

Calculation Name must be unique and should be descriptive enough to be identifiable for future reference (in case you wish to run the report again).

Select the site for which you wish to extract data (if applicable).

Rate Calculation parameters		Select your Hospital	
Calculation Name	SeattleGrace_NAUSP (81 antibiotics)	Contributor	Seattle Grace Test Hospital ▼

You may select from any ward/location you contribute to; however acute and sub-acute areas should not be combined. If you select multiple areas (within the same acuity), you can elect to have them extracted separately or as an aggregate. *Total acute* refers to all acute hospital use (no subacute areas will be included in this selection).

Any *Total Acute* rates extracted will **exclude** Emergency Department and Theatre and Recovery usage. Further, Emergency Department and Theatre and Recovery can only be extracted independently (not combined with any other area); this is due to the denominator type used in these areas being incompatible with overnight bed days (OBDs) that is the measure of patient activity in other locations.

Select which **comparators** (if any) you wish to extract aggregate data for. You will be able to choose from a combination of geographical regions and AIHW peer groups that are applicable to your facility. There must be a minimum of three sites in any given comparator group to facilitate this feature.

For example, Seattle Grace is a Private Acute Group A hospital in metropolitan South Australia. It is also a member of a local health district called Central Adelaide.

Available comparator rates to select from include:

> All hospitals (i.e. all current active NAUSP contributors) at national, state or city level

> All Private Acute Group A hospitals at national, state or city level

> All combined (public *and* private) Group A hospitals, at national, state or city level

Antimicrobials of interest – select which classes, agents **or** formulations you wish to look at. Please ensure you click the *Add* button after selecting individual agents and that your selection appears in the list below the drop-down boxes. To remove an agent from the rate calculation, check the *Remove* box prior to saving.

*It is strongly recommended to request only from <u>one</u> of the selection drop downs, i.e. **do not** request both classes and agents in the one rate calculation. This will ensure the resultant report is uniform in output.*

Appearance – to further define your data, select:

> Route of administration – e.g. to visualise IV versus oral use

> Period Type – options include monthly, quarterly, half yearly, yearly, or financial year where usage rates are extracted as an aggregate over the selected period.

> Periods (for moving average (MA) output) – options include 3- or 5-month moving average

In the case of a 3-month moving average (MA), this is calculated by averaging the usage rates for the month prior to, the month after, and the month in question. For example, a February 3-month MA is the average of January, February, and March rates. Selecting a moving average smooths longitudinal data for more better visual interpretation of trends, and minimises any 'saw tooth' effects from monthly distributions.

In the example below, selecting amikacin, gentamicin and tobramycin in the *Add Antimicrobial Agent* drop-down with the *Report Antimicrobials Separately* box **checked** will result in the three agents being reported separately. Leaving this box unchecked will result in the aggregate of the three agents and usually equal to the rate of the *Aminoglycosides (excl. streptomycin)* class as a whole (a difference would only occur if neomycin was included in data collection).

7.2 Executing a rate calculation

Once you have selected the desired parameters for the data you wish to extract as a rate calculation, simply run by pressing the paper plane icon.

Enter your date range in the pop-up window and press the *Run* button. You will receive email notification that your rate calculation has been scheduled, and once completed, will be sent to your registered email address as an Excel file attachment.

> **Sheet 1** of the spreadsheet (Summary) outlines details of the rate calculation for your reference.

> **Sheet 2** (named with your facility) displays usage rates (in DDD/1,000 denominator (OBD or presentations)) for your hospital. *RateMA* refers to the moving average and will differ from the *Rate* if you selected 3 or 5 periods. Remaining columns show **quantity** (of vials, tablets, tubes etc), **denominator** (OBD or presentations), **DDDs** and **grams** respectively.

> **Sheets 3** (and beyond) contain rate calculations for any comparator groups you selected. The data contained in these sheets represent the aggregate figures within the selected comparator group/s.

7.3 NAUSP Rate Calculation Templates

To save you some time, NAUSP has created some commonly used rate calculations that you can copy and edit as desired. To use a template:

> Click *Copy* to open the edit screen

> Rename the rate calculation and make any adjustments required

> Click *Save As*

The rate calculation will now appear in your working list and can be used however you like. Outlined below are a selection you may find useful.

7.3.1 Check variable dose infusions (QA)

This rate calculation allows you to check that variable dose infusion quantities (aliased to a 1mg product by NAUSP) have correctly been amended to reflect the total number of milligrams used across the number of devices used for the month.

7.3.2 Check oral liquids (QA)

According to NAUSP principles, the unit quantity for oral liquid formulations is number of bottles **NOT** number of millilitres. This rate calculation will extract all current oral liquid formulation antimicrobials for a given hospital over a prescribed period. Users are encouraged to run this report and either filter or sort quantities to assess the accuracy of quantities such as multiples of 100 or +/- 5. For facilities that subtract discharge dispensing before data submission, please check that both inpatient and discharge oral liquids are recorded as bottles, not millilitres.

7.3.3 NAUSP Antibacterial classes

This rate calculation includes 30 pre-populated antibacterial classes and can be used to extract data at either an individual class level or aggregated.

7.3.4 NAUSP Antibacterials

This rate calculation includes pre-populated antibacterial agents and can be used to extract data at either an individual agent level or aggregated. This list mirrors that which the NAUSP Team use for annual reporting purposes.

7.3.5 NAUSP Antifungals

This rate calculation includes pre-populated antifungal agents and can be used to extract data at either an individual agent level or aggregated.

7.3.6 NAUSP Antivirals

This rate calculation includes pre-populated antiviral agents and can be used to extract data at either an individual agent level or aggregated. Note: most antiviral combinations are not included as ATC DDDs have not yet been determined.

7.3.7 PAL ACCESS / CONTAIN / CURB

These three templates mirror the ACSQHC Priority Antimicrobial List (PAL) for Antimicrobial Resistance Containment categories. The purpose of the PAL is to promote quality antimicrobial prescribing. More detail can be obtained from the Australian Commission on Safety and Quality in Health Care.

Using the Rate Calculation Tool on the NAUSP Portal video tutorial demonstrates how to calculate antimicrobial utilisation rates**.**

8 Reports

Pre-defined reports, such as those presented to Antimicrobial Stewardship (AMS) committees, are available through NAUSP reporting functionality. Portal users can run a variety of reports and choose their comparator to enable benchmarking of antimicrobial usage. These options are outlined below.

To access reporting functions, click the *Generate Reports* button under the *Data Analysis* menu from the NAUSP Portal.

Please be aware that report generation with a benchmark will only be successful if at least 80% of data within a peer group are loaded across the date range specified. Hovering over each comparator option will display the percentage of data loaded within the group. This percentage is calculated for the date range selected. If insufficient data are available to form a comparator rate, you will not be able to select the comparator checkbox. Users are encouraged to load usage data promptly each month (after denominator data is finalised) so that all users can download reports in a timely fashion.

8.1 Types of reports

Users can access different types of reports, as defined below.

> Standard NAUSP Report:

- A selection of reports for both antibacterial and antifungal usage is available across acute (with or without Critical Care) and subacute areas. Users can run reports whenever they choose and for a time period of their choice with appropriate comparator/benchmark.

> Ward/Location Reports:

- *Intra-hospital Benchmark Report* – your hospital ward/location use benchmarked against your total acute hospital use (exclusive of Emergency Department or Theatre and Recovery)
- *NAUSP Location Report* – select wards/locations have dedicated reports created with agents more suited to the selected ward/location available for reporting. These areas are currently Emergency Department, Haematology/Oncology, and Theatre and recovery.

The following tables summarise report options and agents included in the output for selected NAUSP Reports.

Table 1: Standard NAUSP Report options and outputs

Dropdown selections			Output	Data
Report Template	**Report**	**Ward/Location**		
Standard NAUSP Report	Standard NAUSP Report (TOTAL acute-care)	N/A	**ALL ROUTES** • 3rd/4th gen cephalosporins • glycopeptides • carbapenems • fluoroquinolones • aminoglycosides • IV penicillin/β-lactam inhibitor	Acute wards (aggregate)
Standard NAUSP Report	Standard NAUSP Report (with Critical care)	N/A	**ALL ROUTES** *CritCare and non CritCare reported separately:* • 3rd/4th gen cephalosporins • glycopeptides • carbapenems • fluoroquinolones • aminoglycosides • IV penicillin/β-lactam inhibitor	Acute wards (Crit Care, non Crit-Care)
Standard NAUSP Report	Standard NAUSP Report (TOTAL sub-acute excl. HITH)	N/A	**VARIOUS ROUTES** • All antibacterials oral v IV • IV cefazolin, ceftriaxone, fluclox • IV amox-clav, pip-taz, benpen • ORAL amox, amox-clav, cefalexin • ORAL trimethoprim, cotrimox, nitrofurantoin • ORAL clinda, doxy, fluclox • ORAL fluoroquinolones • ORAL macrolides	Sub-acute wads (excl. HITH)
Standard NAUSP Report	Standard NAUSP Report (HITH, no comparator)	N/A	• All antibacterials oral v IV • IV flucloxacillin • IV cefazolin • IV ceftriaxone • IV amoxicillin-clavulanate • IV piperacillin-tazobactam • IV benzylpenicillin • IV vancomycin	Hospital in the Home (HITH)
Standard NAUSP Report	NAUSP Antifungals (acute-care)	N/A	**VARIOUS ROUTES** *CritCare and non CritCare reported separately:* • All antifungals • All antifungals oral v IV • Triazoles (all routes) • echinocandins • amphotericin (B & lipo) • flucytosine • ketoconazole • terbinafine	Acute wards (Crit Care, nonCrit-Care)

Table 2: Ward/Location NAUSP Report options and outputs

Dropdown selections			Output	Data
Report Template	**Report**	**Ward/Location**		
Ward/Location Report	NAUSP Location Report – Theatre/ Recovery	Theatre/ Recovery	• All antibacterials oral • All antibacterials IV • IV cefazolin • IV gentamicin • IV vancomycin • IV metronidazole • IV clindamycin • Topical chloramphenicol (4g oint)	Theatre/Recovery Day surgery
Ward/Location Report	NAUSP Location Report – Emergency Department	Emergency Department	**VARIOUS ROUTES** • All antibacterials oral • All antibacterials IV • IV cephalosporins • IV penicillin/β-lactam inhibitors • ORAL macrolides • ORAL fluoroquinolones • ORAL amox, amox-clav, cefalexin • ORAL cotrimox, cefuroxime, doxy	Emergency Department
Ward/Location Report	NAUSP Location Report – HaemOnc	Haematology/ Oncology	**VARIOUS ROUTES** • All antibacterials oral v IV • All antifungals oral v IV • 3rd/4th gen cephalosporins • glycopetides • carbapenems • fluoroquinolones • aminoglycosides • IV penicillin/β-lactam inhibitor • IV flu-, posa-, voriconazole • ORAL flu-, posa-, voriconazole • echinocandins • amphotericin • trimethoprim-sulfamethoxazole • ORAL doxycycline	Haematology/Oncology

*Sub-acute locations can be selected from the Ward/Location selection drop-down, however the agents/classes included in this report may not be relevant (or register any usage).

8.2 Generate report

1. Select the facility for which you wish to generate a report (you will only have sites that you are authorised to report for available for your selection)

2. Enter the desired date range. Note: Ward/location reporting options (except for Critical Care) are only available from January 2021 when granular reporting was first introduced

3. Select a report template from the drop-down menu

4. Select desired report from drop-down menu
    > Ward/Location reports will activate a second drop-down menu to select the data source/location.

5. Select the Benchmarking Group from the available options
    > If a comparator benchmarking group is not selected, the default comparator is All National contributors. Available comparators will depend on your individual hospital but can include national, state, AIHW peer and multi-state (e.g. NSW and ACT) comparators.
    > Intra-hospital reports do not require a benchmarking group.
    > Theatre and Recovery and HITH reports are not currently benchmarked due to variation in denominators between sites

6. A notification that your request has been added to the queue and an email notifying that a requested NAUSP report is pending will be displayed

7. Your report should be emailed to your registered email address as an attachment within 24 hours (most often within 15 minutes – contact the NAUSP helpdesk if it has been longer)

9 Data validation and QA

Contributing facilities are responsible for uploading accurate data. NAUSP has developed several checks and balances to promote robust data entry and extraction.

9.1 Data validation processes when loading data

To ensure the accuracy of data being loaded, NAUSP users must review their upload prior to submission. Please take the time to review the data warnings for **each** ward/location tab when uploading drug usage.

9.1.1 Usage warnings tab

These warnings are flagged when:

> quantities of antimicrobial formulations are less than 50% or greater than 200% of 12-month average

> the number of bottles of an antimicrobial oral liquid is greater than 20

> quantities are less than -10

> quantity is zero and average usage quantity is greater than 50

> denominator values are less than 50% or greater than 200% of 12-month average

9.1.2 Discarded antimicrobials tab

This tab is available for you to see antimicrobials that are automatically excluded by NAUSP at each submission. If you wish to include any of these items, you will need to discuss with the NAUSP team.

9.1.3 Submission summary tab

Prior to submission of data, you can review quantities of antimicrobial agents to be added to the NAUSP database.

9.2 Data validation processes when extracting data

There are two sequential steps built into the Portal designed to alert users to low or insufficient benchmark data when running rate calculations and reports. These warnings should be kept in mind when interpreting any output from the Portal.

Warning type	Meaning
Hover over comparator checkbox	The "hover" warning will appear when selecting comparator/s for a report or rate calculation. The percentage displayed indicates the volume of data loaded <u>across</u> the entire date range selected. Only comparators with a minimum of 80% of data for the date range entered can be selected – these will appear as blue checkboxes.
	Comparators that do not meet the 80% threshold will be greyed out, and unable to be selected when running reports, but will be able to be selected when running rate calculations. Adjusting the date range may result in changes to the percentage displayed.
Data Availability Warning pop-up*	The pop-up warning box will appear after the parameters for the report/rate calculation have been entered and set to run. <u>Any individual months </u>for the selected comparator group that do not meet the 80% threshold will be displayed at this screen. This will allow you to interpret the resultant report/rate calculation with data reliability in mind.
	For example, running a report at the beginning of a new month will likely result in the previous month flagging as having low data. Running the same report later in the month (as more data are loaded by other contributors) will produce a more reliable comparator for these months.

This feature is under review and not currently available

9.3 QA responsibilities

9.3.1 Responsibilities of contributor facilities

NAUSP relies on contributors regularly assessing their monthly dispensing extracts to ensure all antimicrobial usage is captured, including new drugs/formulations, and that only wards/locations and denominator data that meet NAUSP inclusion criteria are uploaded.

9.3.2 Responsibilities of NAUSP

NAUSP will request the denominator record sheet for each contributor twice a year and prior to preparation of any significant reports. This information will be used to confirm figures entered to the Portal, and to cross-check ward/location inclusions supplied for antimicrobial usage. NAUSP will inform contributors if QA processes result in any alterations to usage or denominator data.

10 Further information/Troubleshooting

Some frequently encountered technical errors/questions are answered in NAUSP Portal Frequently Asked Questions

Appendix 1 - How to concatenate cells

If each piece of required information is contained in separate cells, they must first be joined together (concatenated) prior to populating the NAUSP template. In this example, we need to concatenate columns D, E & F.

Select the column to the *right* of where you would like a new column inserted by clicking on the Column Letter (e.g. "B" below). Under the "Insert" menu, select "Insert Sheet Columns".

In the first row of the newly created column (or formula bar), we want to end up with the text.

=CONCATENATE (E3," ",F3," ",G3). Please note that there is a space between the inverted commas to allow a space between the content of the cells once joined.

This can be entered manually by typing in the cell reference (E3, F3, G3) or clicking on each cell in the correct order with a comma, inverted comma, space, inverted comma, comma between the cell references.

Select the newly populated cell and hover over the bottom right corner until the cursor/pointer changes to a small black **+** symbol. Click and hold the left mouse button and drag down the empty cells to copy the formula. They will populate when you release the mouse.

Book1 - Microsoft Excel

| | Home | Insert | Page Layout | Formulas | Data | Review | View | Developer |

B3 =CONCATENATE(E3," ",F3," ",G3)

	A	B	C	D	E	F	G	H
1	**NAUSP HQ - Jan 2015 - ICU**							
2			Qty		Drug	Strength	Form	Location
3	ACIC3	ACICLOVIR 250mg/10mL INJ	55	ACI15	ACICLOVIR	250mg/10mL	INJ	ICU
4	AMOX10		20	AMO14	AMOXYCILLIN	500mg	CP	ICU
5	AMOX25		10	AMO36	AMOXYCILLIN-CLAVULANIC ACID	875mg-125mg	TB	ICU
6	AMPH10		18	AMP59	AMPHOTERICIN (Liposomal)	50mg	INJ	ICU
7	ANID1		10	ANI3	ANIDULAFUNGIN	100mg	INJ	ICU

The result should look similar to the example below (with your data, of course).

Book1 - Microsoft Excel

| | Home | Insert | Page Layout | Formulas | Data | Review | View | Developer |

L17

	A	B	C	D	E	F	G	H
1	**NAUSP HQ - Jan 2015 - ICU**							
2		Product	Qty		Drug	Strength	Form	Location
3	ACIC3	ACICLOVIR 250mg/10mL INJ	55	ACI15	ACICLOVIR	250mg/10mL	INJ	ICU
4	AMOX10	AMOXYCILLIN 500mg CP	20	AMO14	AMOXYCILLIN	500mg	CP	ICU
5	AMOX25	AMOXYCILLIN-CLAVULANIC ACID 875n	10	AMO36	AMOXYCILLIN-CLAVULANIC ACID	875mg-125mg	TB	ICU
6	AMPH10	AMPHOTERICIN (Liposomal) 50mg INJ	18	AMP59	AMPHOTERICIN (Liposomal)	50mg	INJ	ICU
7	ANID1	ANIDULAFUNGIN 100mg INJ	10	ANI3	ANIDULAFUNGIN	100mg	INJ	ICU
8	AZIT4	AZITHROMYCIN 500mg INJ	10	AZI51	AZITHROMYCIN	500mg	INJ	ICU
9	BENZ67	BENZYLPENICILLIN 1.2g INJ	65	BEN40	BENZYLPENICILLIN	1.2g	INJ	ICU
10	BENZ70	BENZYLPENICILLIN 3g INJ	10	BEN24	BENZYLPENICILLIN	3g	INJ	ICU
11	BENZ72	BENZYLPENICILLIN 600mg INJ	60	BEN25	BENZYLPENICILLIN	600mg	INJ	ICU
12	CEFT2	CEFTRIAXONE 1g INJ	55	CEF11	CEFTRIAXONE	1g	INJ	ICU
13	CEPH6	CEPHALEXIN 500mg CP	20	CEP8	CEPHALEXIN	500mg	CP	ICU
14	CEPH8	CEPHAZOLIN 1g INJ	270	CEP12	CEPHAZOLIN	1g	INJ	ICU
15	CIPR11	CIPROFLOXACIN 400mg/200mL INF	10	CIP121	CIPROFLOXACIN	400mg/200mL	INF	ICU
16	DAPT1	DAPTOMYCIN 350mg INJ	3	DAP41	DAPTOMYCIN	350mg	INJ	ICU
17	DOXY5	DOXYCYCLINE 100mg TB	70	DOX7	DOXYCYCLINE	100mg	TB	ICU
18	ERYT8	ERYTHROMYCIN 1g INJ	30	ERY3	ERYTHROMYCIN	1g	INJ	ICU
19	FLUC17	FLUCONAZOLE 200mg/100mL INJ	46	FLU12	FLUCONAZOLE	200mg/100mL	INJ	ICU

You can then select the required information (Product & Qty) to transfer into the NAUSP template.

> If you do not put a space between the inverted commas in **=CONCATENATE(E3," ",F3," ",G3)** the end result will read **ACICLOVIR250mg/10mLINJ** and will not be recognised by the database as a known drug.

> The joining process occurs in the exact order the cells are entered into the formula. For example:

   =CONCATENATE(G3," ",E3," ",F3)

will return the result **INJ ACICLOVIR 250mg/10mL**. While this data should be accepted by the database, it is confusing and does not look neat.

Appendix 2 - OBD template

Demo Hospital - Denominator Record 2022

Accurate denominators are essential to the accurate calculation of antimicrobial usage rates - a small change in denominator can make a huge difference to the calculated rate.

Please ensure included wards are all those from which antimicrobial usage data is sourced, and that occupancy data are not provided for excluded wards. See NAUSP website for details on exclusions (eg paediatrics, outpat...

Please take care to ensure the correct wards are included! Ward usage and report terminology can change over time so regular checking of description is recommended

Legend:

Ward Code	Description
Ward A	Medical
Ward B	Surgical
Ward C	Paediatrics
Ward D	Obs/Gynaegology
Ward E	Coronary Care Unit
Ward F	Dialysis
ICU	Intensive Care Unit
Ward G	Aged Care
Ward H	Mixed subacute (aged, rehab)

Please complete this table and send this file to NAUSP when asked to supply occupancy data for Quality Assurance activities.

Denom. Type	Ward Code/Name	Jan	Feb	Mar	Jul	Aug
No. of cases/ presentations	**OPERATING THEATRE/S**	334	443			
	EMERGENCY DEPT	1264	1543			
Occupied Bed Days	**ACUTE WARDS**					
	Critical Care (HDU + ICU)	45	46			
	Ward A - Med	85	97			
	Ward B - Surg	154	140			
	Ward D - Maternity	88	101			
	Ward E - CCU	78	94			
Occupied Bed Days	**SUBACUTE WARDS**					
	Ward G - Aged Care	221	223			
	Ward H - mixed	124	133			
Occupied Bed Days	**EXCLUDED WARDS**					
	Ward C - Paeds	67	58			
	Ward F - Day dialysis	34	28			

	Jan	Feb	Mar					
Critical Care	45	46	0	0	0	0	0	0
ObsGynae	88	101	0	0	0	0	0	0
Other/Unspecified Acute	=C13+C14+C16	223	0	0	0	0	0	0
Aged Care	221	223	0	0	0	0	0	0
Other/Unspecified Subacute	124	133	0	0	0	0	0	0

Connor, Erin: Monthly count of surgical procedures (incl. day surgery)

Connor, Erin: Monthly count of ED presentations

Connor, Erin: Use formulae to identify and sum the wards that contribute to each NAUSP location

Appendix 3 - Example of how to extract NAUSP data from iPharmacy®

The following information has been kindly provided by one of the hospitals that contributes to NAUSP. It details how they extract their antimicrobial usage data and prepare it for submission to the NAUSP Portal (hospital and ward information have been de-identified). Please note that the steps below may differ from those required at your hospital (especially if you are using a different dispensing system). Please contact the NAUSP Helpdesk (Health.NAUSPhelp@sa.gov.au) if you have any questions about data extraction at your hospital.

1. Log into iPharmacy® and click on Crystal Reports
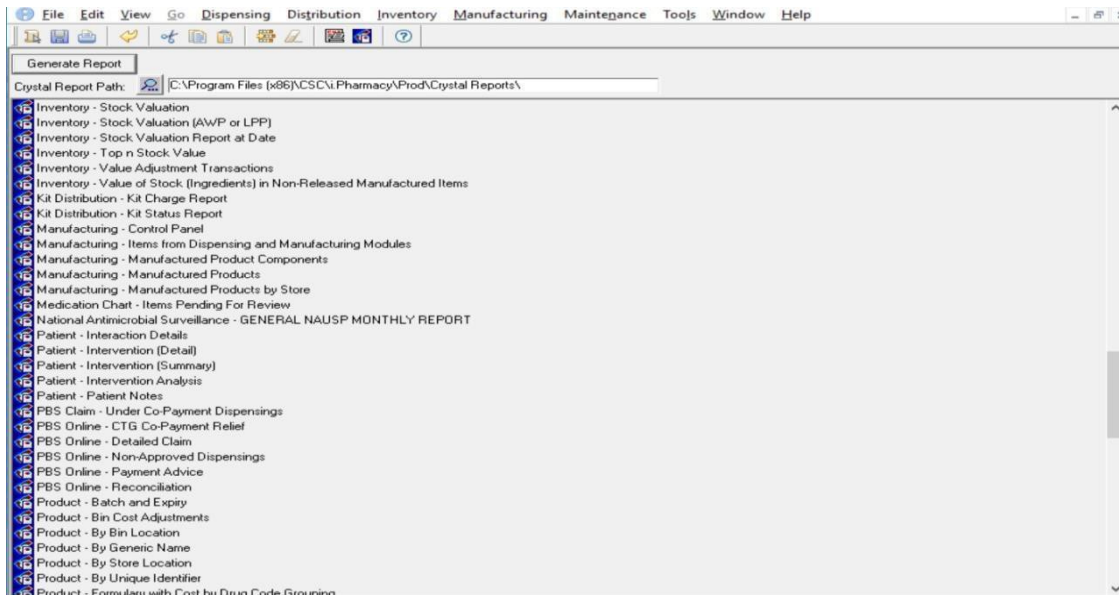
2. Click on Infrequently Used Reports folder and then OK

3. Locate the report that your hospital uses to provide data to NAUSP and click on it. This report should count inpatient dispensings and distributions. See example below to guide that the correct categories are included in your report.

Note: The screen grab above is illustrative only to show users the types of categories they may have in iPharmacy. Users should select those applicable for their NAUSP crystal report.

4. Enter the details for the report you want to generate – i.e. which facility location and what month

5. This report should come up:

6. Click on the export icon (2nd from the left) and save as excel file to wherever you like
7. Open the Excel file

8. Delete all columns except 'Ward', 'Drug' and 'Total', and delete the first rows up to 'Ward', 'Drug' and 'Total'. Make a note of which letter these columns are to speed up the process in the future.

9. Make a table and insert a blank column between ward and drug – this is to facilitate matching the format of the NAUSP template as the new blank column will become the Ward/Location column.

10. In the ward column – deselect all wards and then select the ones that are reported to NAUSP

11. Open the standard NAUSP Excel template from the previous month – change the month on the 3rd row and then save as the new month with the correct name format e.g. SEA_2022_01. If this is your first submission use the standard NAUSP Excel template from the NAUSP website.

12. Copy and paste the excel data from your original exported excel file into the formatted NAUSP Excel file

	Ward description	Ward/Location	Product description (name, strength, form, pack/liq qty/ml)	Quantity
	Hospital/Facility	Seattle Grace Test Hospital		
	Year (yyyy)	2022		
	Month	Jan		
	Ward description	**Ward/Location**	**Product description (name, strength, form, pack/liq qty/ml)**	**Quantity**
	ASC1	Haematology/Oncology	Aciclovir (Blistex Antiviral Cold Sore) 5 % Cream 5 g	1.00
	ASC1	Haematology/Oncology	Amoxicillin (Amoxycillin (Blister) (Apo)) 500 mg Capsule 20	40.00
	ASC1	Haematology/Oncology	Amoxicillin (Ibiamox) 1,000 mg Vial 10	60.00
	ASC1	Haematology/Oncology	Amoxicillin + Clavulanic Acid (Curam Duo Forte) 875 mg / 125 mg Tablet 10	60.00
	ASC1	Haematology/Oncology	valAciclovir (valAciclovir (Rbx)) 500 mg Tablet 30	60.00
	ASC1	Haematology/Oncology	valAciclovir (valAciclovir (Rbx)) 500 mg Tablet 42	168.00
	ASC1	Haematology/Oncology	Vancomycin (Vancomycin (ALP)) 1 g Vial 20 mL	20.00
	ASC1	Haematology/Oncology	Voriconazole (Voriconazole FCT (Blister) (Sz)) 50 mg Tablet 56	56.00
	ASE1	Haematology/Oncology	Dicloxacillin (Dicloxacillin (Mylan)) 500 mg Capsule 24	24.00
	ASI1	Critical Care (ICU/HDU)	Anidulafungin (Eraxis) 100 mg Vial 1	6.00
	ASI1	Critical Care (ICU/HDU)	ERYthromycin (E-Mycin) 200 mg/ 5 mL Suspension 100 mL	100.00
	ASI1	Critical Care (ICU/HDU)	ERYthromycin (Erythrocin IV) 1 g Vial 1	9.00
	ASICT	Emergency Department	Amoxicillin (Ibiamox) 1,000 mg Vial 10	30.00
	ASICT	Emergency Department	cefTRIAXONE (cefTRIAXONE (Aft)) 1 g Vial 5	10.00
	ASICT	Emergency Department	Flucloxacillin (Flubiclox) 1 g Vial 10	10.00
	ASICT	Emergency Department	linCOMYCIN (Lincocin) 600 mg Vial 2 mL x 5	5.00
	ASICT	Emergency Department	Teicoplanin (Teicoplanin (Sz)) 400 mg Vial 3 mL	32.00
	ASICT	Emergency Department	Vancomycin (Vancomycin (ALP)) 1 g Vial 20 mL	5.00
	ASIE1	Critical Care (ICU/HDU)	cefaZOLin (cefaZOLin (Aft)) 1 g Vial 5	50.00
	ASIE1	Critical Care (ICU/HDU)	Gentamicin (Gentamicin (Steriluer) (Pf)) 80 mg Injection 2 mL x 50	50.00
	ASIE1	Theatre and Recovery	Amoxicillin (Amoxycillin (Sz)) 500 mg Capsule 20	20.00
	ASIE1	Theatre and Recovery	Amoxicillin (Ibiamox) 1,000 mg Vial 10	10.00
	ASIE1	Theatre and Recovery	Amoxicillin + Clavulanic Acid (Curam Duo Forte) 875 mg / 125 mg Tablet 10	30.00
	ASIE1	Theatre and Recovery	azITHROMYCIN (azITHROMYCIN (ALP)) 500 mg Vial 1	2.00
	ASIE1	Theatre and Recovery	azITHROMYCIN (azITHROMYCIN (Sz)) 500 mg Tablet 3	15.00
	ASIE1	Theatre and Recovery	cefEPIME (cefEPIME Kabi) 2,000 mg Vial 10	10.00

13. Populate the Ward/Location column with appropriate NAUSP category relating to the ward from which the data is referring to.
14. Save and close the Excel file
15. It is suggested that files are saved in an appropriate location and kept for 2 years for future reference.
16. Go to the NAUSP Portal to begin the process of data upload.

See section 6. Uploading data to the portal for further information on data preparation and uploading to the NAUSP Portal.

Appendix 4 - Example of rate calculation output

Case study:

Seattle Grace Hospital (SA) wants to compare their total-hospital usage of aminoglycosides to an aggregate of usage in other SA hospitals. The criteria for the rate calculation will be likethis:

Note: to achieve an output that shows the rates of these three agents separately, the *Report Antimicrobials Separately* box must be checked. If it is not, you will extract an *aggregate* of the agents selected.

Rate calculation output

> **Sheet 1** of the spreadsheet outlines the rate calculation details for your reference.

For example, if trends in usage of aminoglycosides are required, the summary sheet may look like this:

	A	B	C
	Details	**Criteria**	**Data Value**
		Rate Name	SEA_Aminoglycosides
		Date Range	01 Jan 2016 - 01 Dec 2017
		Measure	DDD
		Denominator	OBD
		Specialty	Total
		Benchmarking	South Australia
		J01GB06	amikacin
		J01GB03	gentamicin
		J01GB01	tobramycin
		Contributors	Combined
		Antibiotics	Separate
		Moving Average	3 Periods
		Date Produced	12 Aug 2022
		Period Type	Monthly
		Daily Defined Doseage	Current DDD Settings

| Summary | Seattle Grace Test Hospital | South Australia | Missing Data |

> **Sheet 2** displays usage rates for Hospital X in both DDDs and grams. *RateMA* refers to the moving average and will differ from the rate if you selected 3 or 5 periods. A 3-month moving average (*RateMA*) is an average of the rate from the month preceding, the current month and the month following.

> **Sheets 3 (and beyond)** contain rate calculations for any comparator groups you selected. The data contained in these sheets represent the aggregate figures within the comparator group. In the example above, the benchmarking group includes all SA hospitals. The quantities, denominators and rates are the aggregate (sum) of use in approximately 20 hospitals.

Date	Antibiotic	Contributor Name	Code	Specialty Name	Quantity	Denom	DDD	Grams	Rate	Rate MA
01 Jan 2016	amikacin	South Australia		Total	7	74,325	3.500	3.500	0.047	0.202
01 Feb 2016	amikacin	South Australia		Total	79	79,729	39.500	39.500	0.495	0.365
01 Mar 2016	amikacin	South Australia		Total	93	84,119	46.500	46.500	0.553	0.528
01 Apr 2016	amikacin	South Australia		Total	94	87,447	47.000	47.000	0.537	0.572
01 May 2016	amikacin	South Australia		Total	103	82,229	51.500	51.500	0.626	0.595
01 Jun 2016	amikacin	South Australia		Total	108	87,004	54.000	54.000	0.621	0.540
01 Jul 2016	amikacin	South Australia		Total	57	76,467	28.500	28.500	0.373	0.505
01 Aug 2016	amikacin	South Australia		Total	84	80,661	42.000	42.000	0.521	0.405
01 Sep 2016	amikacin	South Australia		Total	51	79,319	25.500	25.500	0.321	0.578
01 Oct 2016	amikacin	South Australia		Total	141	79,003	70.500	70.500	0.892	0.876
01 Nov 2016	amikacin	South Australia		Total	125	72,411	102.500	62.500	1.416	0.857
01 Dec 2016	amikacin	South Australia		Total	38	72,171	19.000	19.000	0.263	0.627
01 Jan 2016	gentamicin	South Australia		Total	9,337	74,325	3,112.335	746.960	41.875	46.593
01 Feb 2016	gentamicin	South Australia		Total	11,931	79,729	3,977.001	954.480	49.881	48.561
01 Mar 2016	gentamicin	South Australia		Total	13,609	84,119	4,536.332	1,088.720	53.928	48.888
01 Apr 2016	gentamicin	South Australia		Total	11,243	87,447	3,747.667	899.440	42.856	46.321
01 May 2016	gentamicin	South Australia		Total	10,405	82,229	3,468.333	832.400	42.179	43.369
01 Jun 2016	gentamicin	South Australia		Total	11,769	87,004	3,921.542	941.170	45.073	43.068
01 Jul 2016	gentamicin	South Australia		Total	9,628	76,467	3,207.875	769.890	41.951	41.991
01 Aug 2016	gentamicin	South Australia		Total	9,438	80,661	3,141.625	753.990	38.949	43.632
01 Sep 2016	gentamicin	South Australia		Total	11,897	79,319	3,965.667	951.760	49.996	46.044
01 Oct 2016	gentamicin	South Australia		Total	11,662	79,003	3,885.874	932.610	49.186	49.424
01 Nov 2016	gentamicin	South Australia		Total	10,664	72,411	3,554.664	853.120	49.090	49.760
01 Dec 2016	gentamicin	South Australia		Total	11,043	72,171	3,681.001	883.440	51.004	47.912
01 Jan 2016	tobramycin	South Australia		Total	451	74,325	202.833	48.680	2.729	2.099
01 Feb 2016	tobramycin	South Australia		Total	240	79,729	80.001	19.200	1.003	2.098
01 Mar 2016	tobramycin	South Australia		Total	494	84,119	215.417	51.700	2.561	3.280
01 Apr 2016	tobramycin	South Australia		Total	1,324	87,447	548.834	136.040	6.276	4.015
01 May 2016	tobramycin	South Australia		Total	660	82,229	263.750	63.300	3.208	5.511
01 Jun 2016	tobramycin	South Australia		Total	1,554	87,004	613.250	151.500	7.049	3.739
01 Jul 2016	tobramycin	South Australia		Total	115	76,467	73.333	17.600	0.959	3.825
01 Aug 2016	tobramycin	South Australia		Total	676	80,661	279.583	67.100	3.466	2.230
01 Sep 2016	tobramycin	South Australia		Total	481	79,319	179.584	43.100	2.264	2.534
01 Oct 2016	tobramycin	South Australia		Total	365	79,003	147.917	35.500	1.872	1.944
01 Nov 2016	tobramycin	South Australia		Total	269	72,411	122.917	29.500	1.697	1.807
01 Dec 2016	tobramycin	South Australia		Total	396	72,171	133.750	32.100	1.853	1.988

Summary | Seattle Grace Test Hospital | **South Australia** | Missing Data | ⊕

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For more information