A casemix classification for ambulance services

PCSI Conference 2022

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1 Health Policy Analysis; 2 Activity Based Management, NSW Health; 3 NSW Ambulance
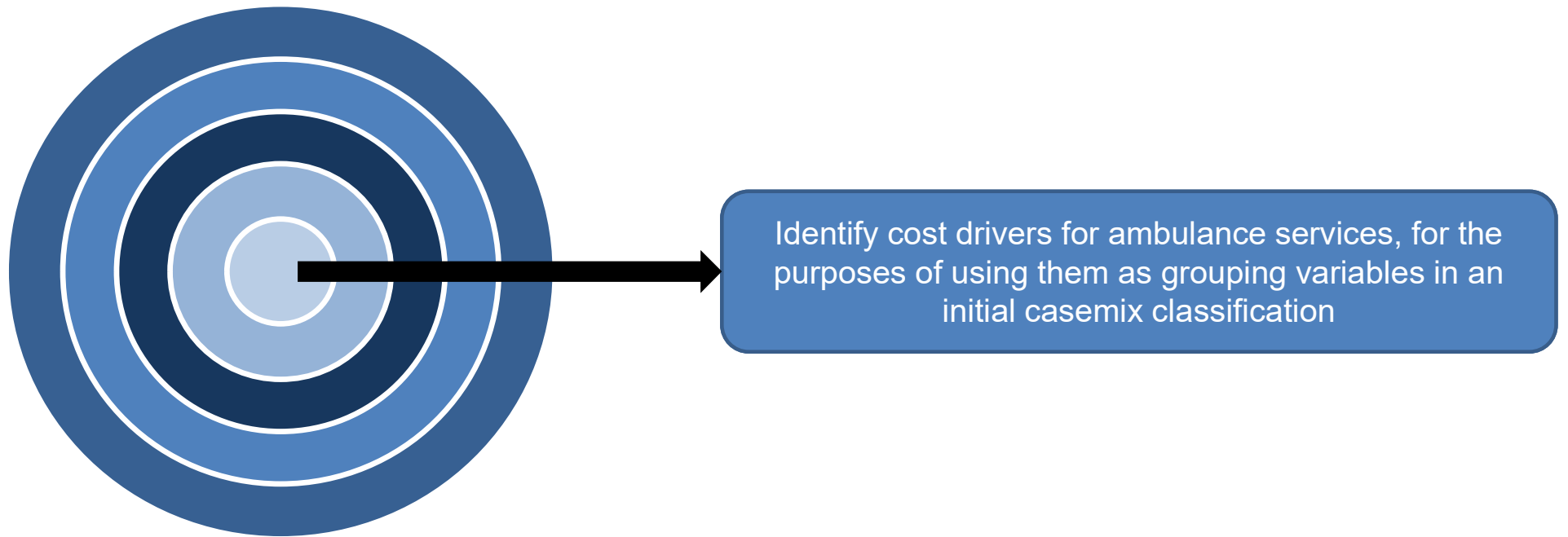
Background

Block funded

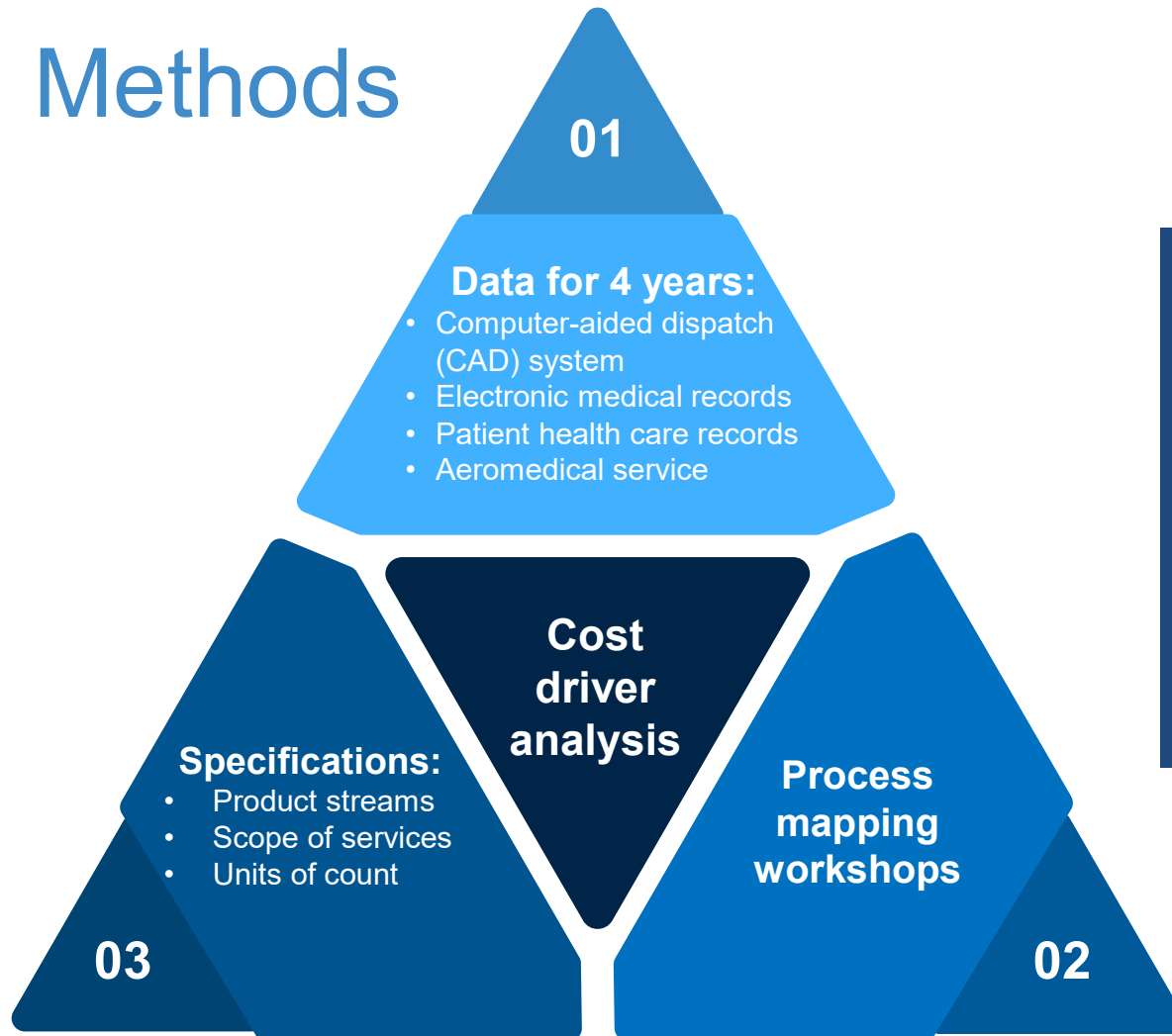Service agreement with NSW Ministry of Health

NSW Ambulance costing project

Develop casemix classification

Objective

Identify cost drivers for ambulance services, for the purposes of using them as grouping variables in an initial casemix classification

Methods

01

Data for 4 years:
- Computer-aided dispatch (CAD) system
- Electronic medical records
- Patient health care records
- Aeromedical service

Cost driver analysis

Specifications:
- Product streams
- Scope of services
- Units of count

03

Process mapping workshops

02

Units of counts

- Episode
- Event
- Journey

Methods

Product streams

1. Emergency episodes, road ambulance
2. Other episodes, road ambulance
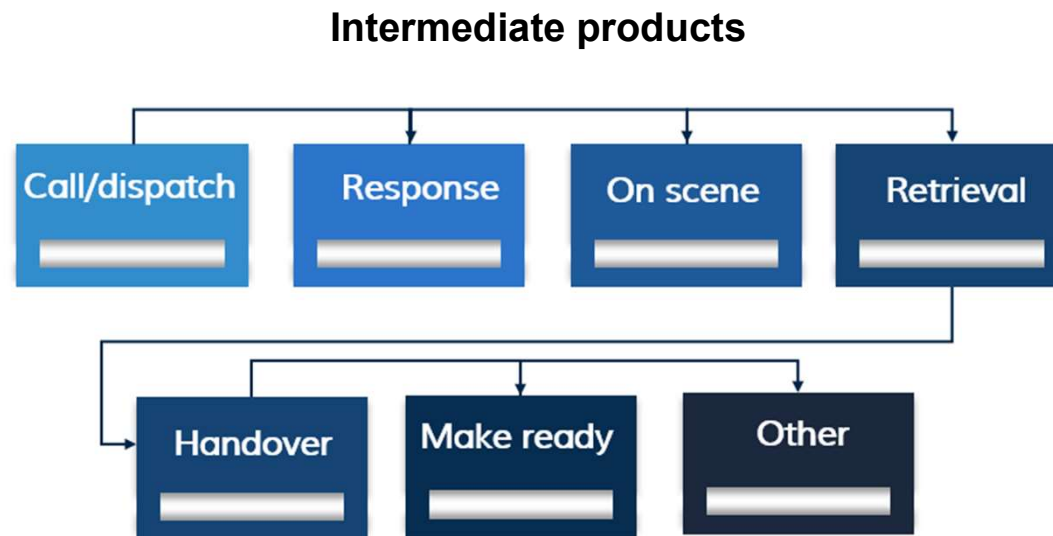3. Aeromedical
4. Events
5. Other services

Products for emergency episodes

1. Call only
2. Dispatch but no treatment
3. Dispatch and treat
4. Dispatch, treat, retrieve

Products for aeromedical

1. Fixed wing retrieval
2. Rotary wing retrieval
3. Aeromedical road retrieval

Methods

Intermediate products

Methods

Variables explored for creating classes (road)
- Dispatch priority level
- Nature of the problem
- Clinical protocol/s implemented
- Extended care paramedics

Variables explored for creating classes (aeromedical)
- Fixed wing aircraft
- Rotary wing aircraft
- Aeromedical road ambulance
- Priority level

Markers of resource use (road)
- Episode duration (from 000 call to completion)
- Mean number of **vehicles** per episode
- Mean number of **intensive care paramedics** per episode

Markers of resource use (aeromedical)
- Duration of service
- Number of bookings (patients)
- Number of "legs" (stops)

Results

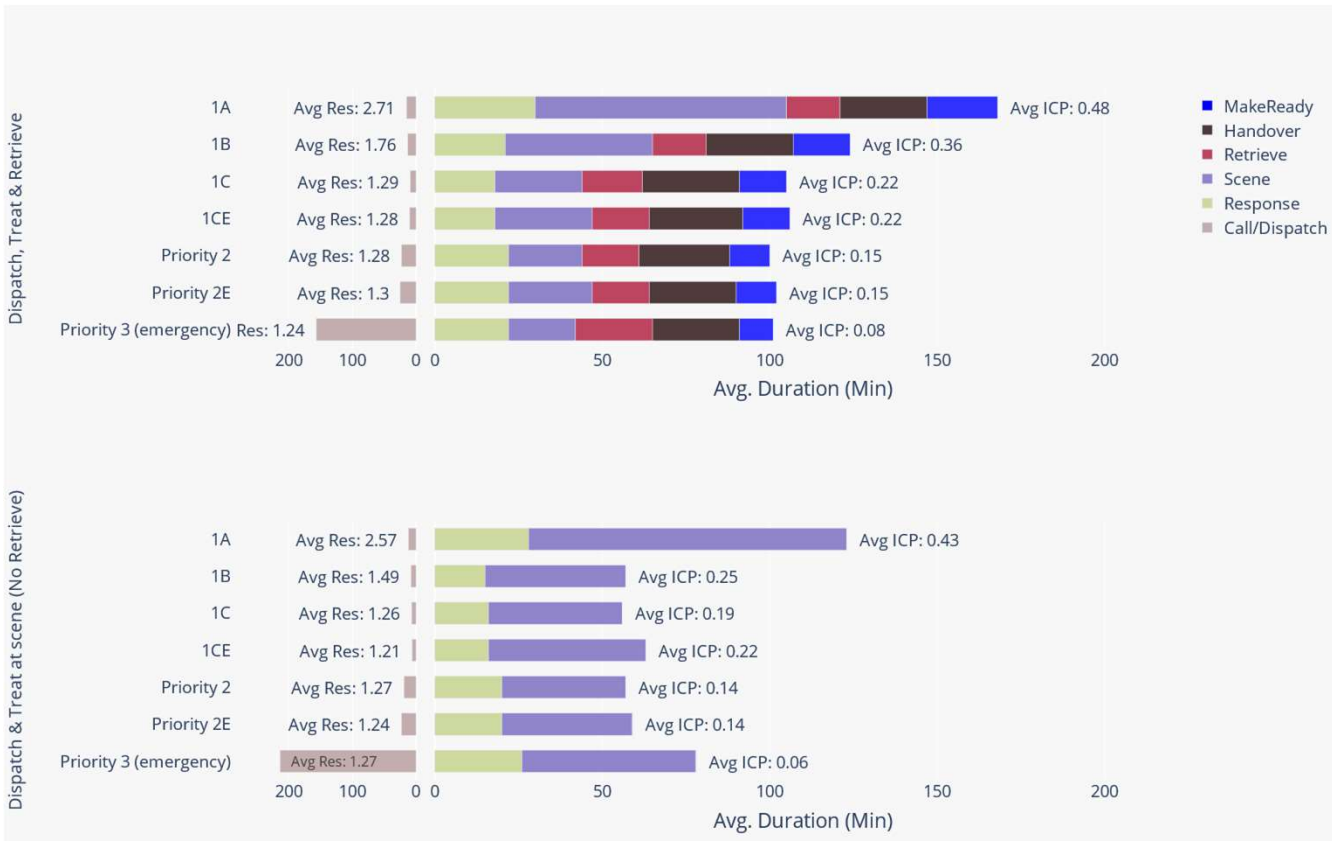Product stream 1 (Emergency episodes, road ambulance)

> 11. Call only
> 12. Dispatch but no treatment
> **13. Dispatch and treat**
> **14. Dispatch, treat, retrieve**

- No further breakdown of products into classes for **Call only** and **Dispatch but no treatment**.

- Further analysis for **Dispatch and treat** and **Dispatch, treat and retrieve.**

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Results

Dispatch priority

Most urgent

Least urgent

Most urgent

Least urgent

Results

Nature of the problem identified by the call taker

Final products 13 and 14
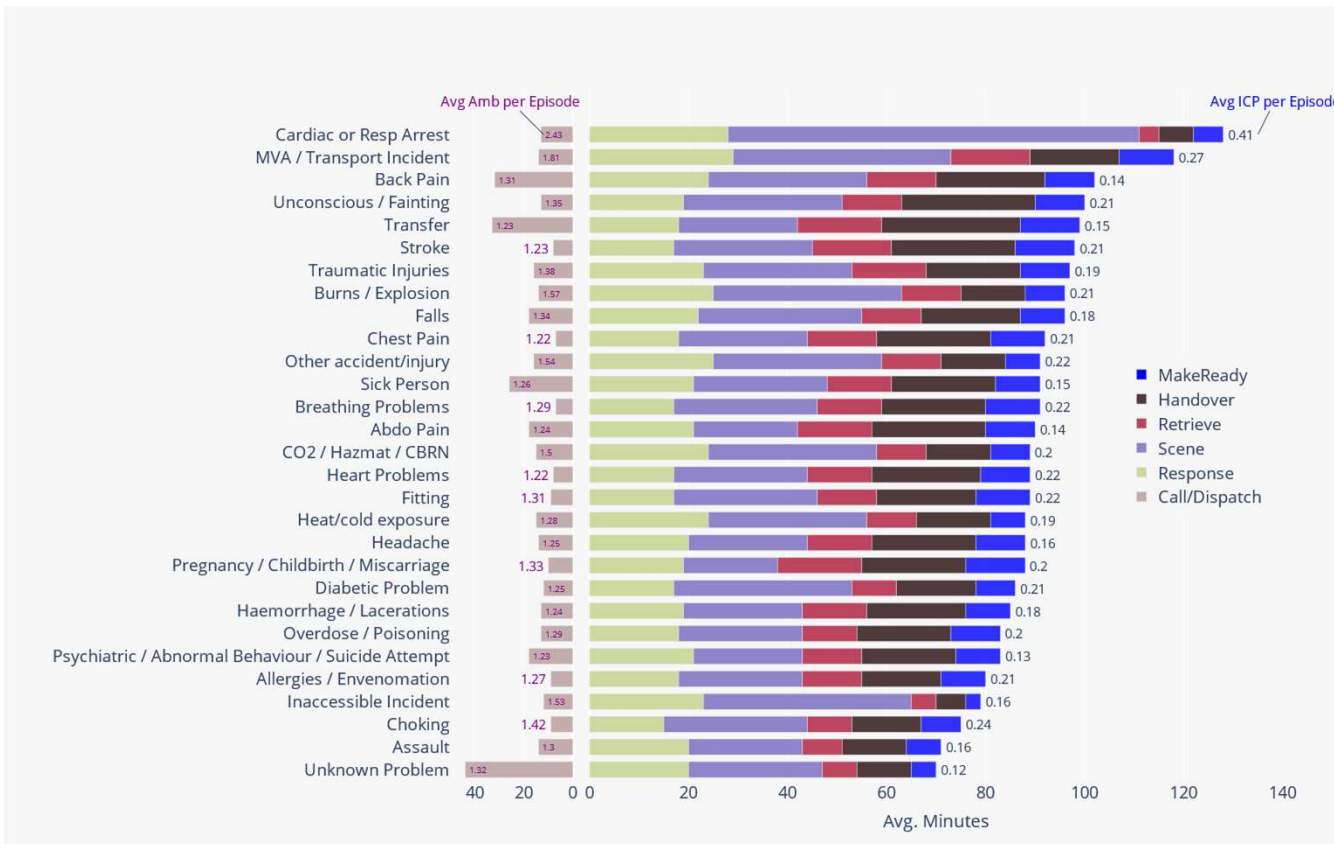
Results
Clinical protocol implemented by the on-scene clinician

Final products 13 and 14
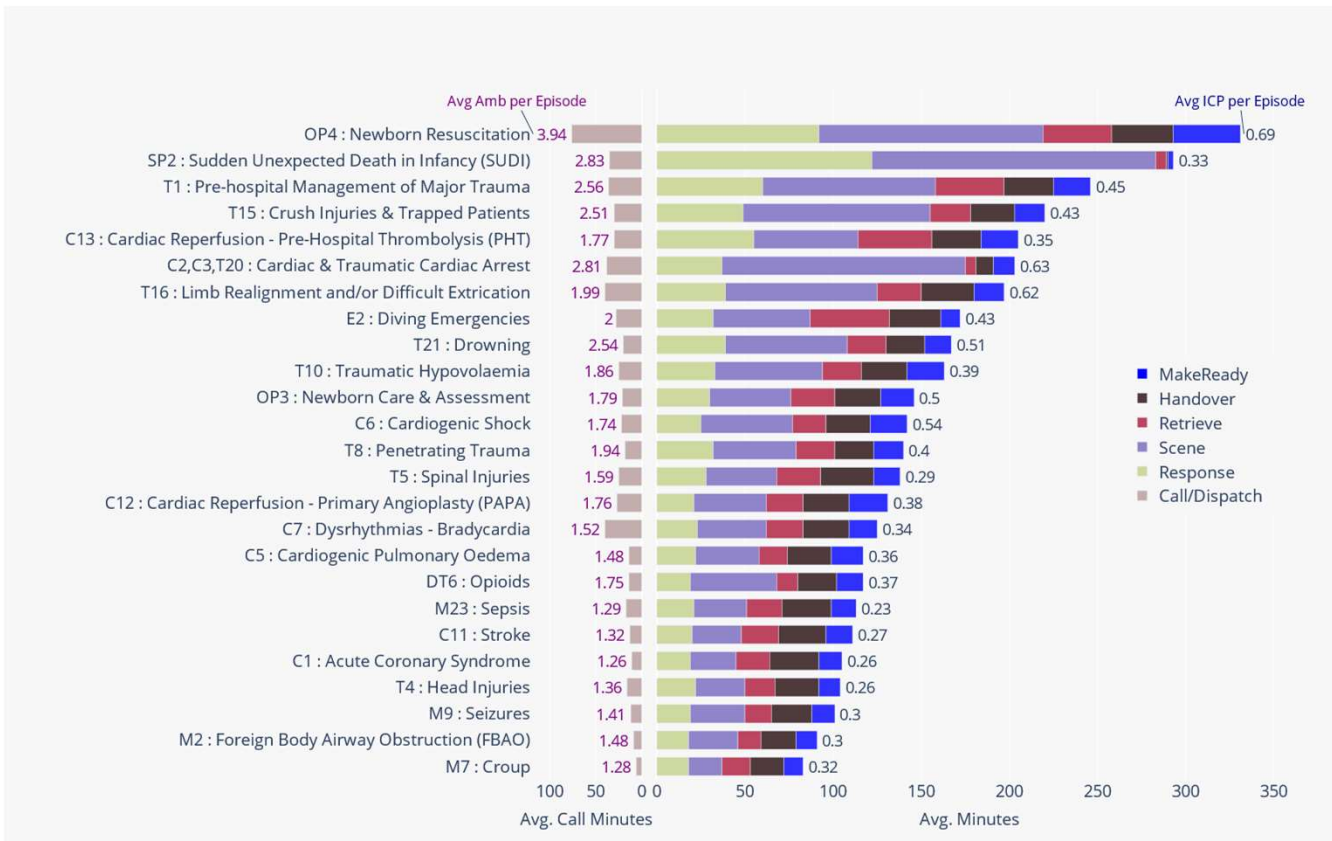
Results

Summary of products and classes for Product stream 1 (Emergency episodes, road ambulance)

1. Call only
2. Dispatch but no treatment
3. Dispatch and treat →
4. Dispatch, treat, retrieve →

Priority 1A
Priority 1B
Priority 1C
Priority 1CE
Priority 2E
Priority 2 All other
Priority 3 (emergency)

Product stream, final product & class	Unit of count
1.Emergency episodes, road ambulance	
11 Call only	Episode
12 Dispatch but no treatment	Episode
13 Dispatch and treat	Episode
131A Priority 1A	
131B Priority 1B	
131C Priority 1C	
131CE Priority 1CE	
132E Priority 2E	
132 Priority 2 All other	
133 Priority 3 (emergency)	
14 Dispatch, treat, retrieve	Episode
141A Priority 1A	
141B Priority 1B	
141C Priority 1C	
141CE Priority 1CE	
142E Priority 2E	
142 Priority 2 All other	
143 Priority 3 (emergency)	

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Results

Product stream 2 (Other episodes, road ambulance)

- There were no relevant indicators of resource available in the data for developing classes for products within this product stream.

| 2. Other episodes, road ambulance	
21 Inter-facility transfers	Non-emergency retrieval of a patient to or from treatment.
22 Clinician in-reach	Emergency response within health facilities that may not have the necessary emergency management equipment.
23 Routine patient transport	Non-emergency transport of a patient following treatment at hospital. Typically involves discharge from hospital to a private residence or residential care facility.
24 Road ambulance component of aeromedical retrieval	Priority 4: Retrieval to or from NSW Ambulance fixed wing resources or to or from domestic or international flights.

Product stream 3 (Aeromedical)

- Not possible to join aeromedical data with road ambulance data.

- Unit of count different to road operations.

- Additional product created in Product stream 2 (Other episodes, road ambulance): **24 Road ambulance component of aeromedical retrieval**.

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Results

Product stream 3 (Aeromedical)

Fixed wing

Rotary wing

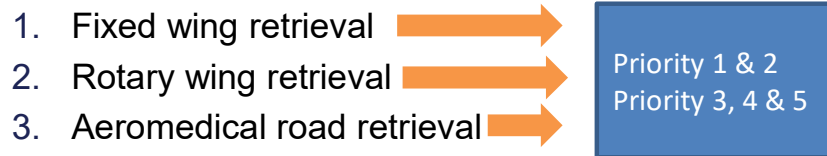**Aeromedical road retrieval**
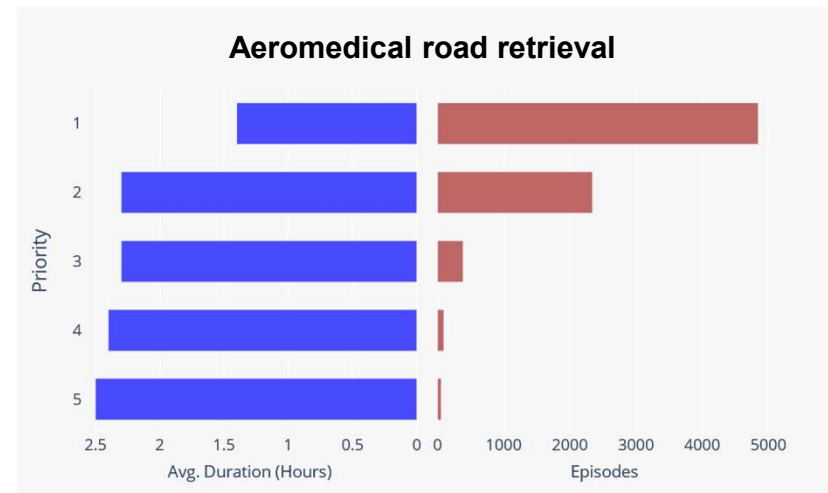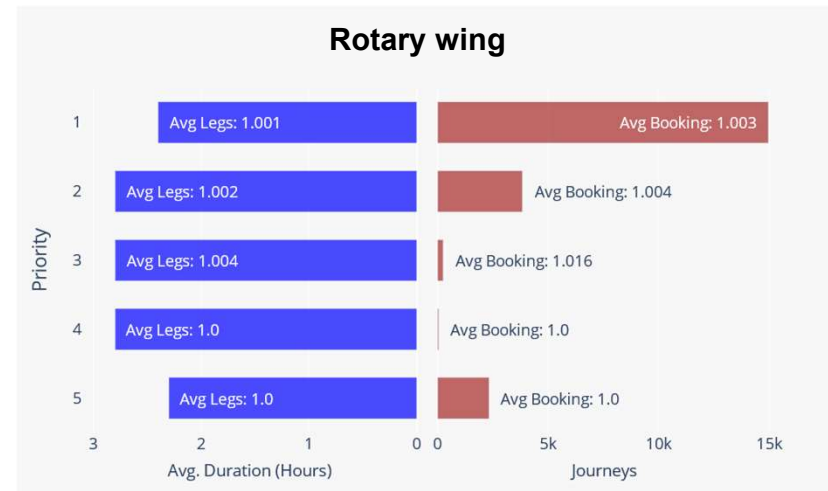
From these analyses, two classes were created by grouping priorities 1 and 2 together, and priorities 3, 4 and 5 together for **fixed wing**, **rotary wing** and **aeromedical road retrieval**.

Results

Summary of Product stream 3 (Aeromedical) products and classes

1. Fixed wing retrieval
2. Rotary wing retrieval
3. Aeromedical road retrieval

Priority 1 & 2
Priority 3, 4 & 5

Product stream, final product & class	Unit of count
3. Aeromedical	
31 Fixed wing retrieval	Journey
311 Priority 1 & 2	
312 Priority 3, 4 & 5	
32 Rotary retrieval	Journey
321 Priority 1 & 2	
322 Priority 3, 4 & 5	
33 Aeromedical road retrieval	Episode
331 Priority 1 & 2	
332 Priority 3, 4 & 5	

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Results

Product streams 4 (Events) and 5 (Other)

- There were no relevant indicators of resource available in the data for developing classes for products within these product streams.

4. Events	
41 Operational stand by	When an ambulance resource or multiple ambulance resources are allocated to an event, either planned or unplanned, to stand by for the safety of a high concentration of citizens or in mass-casualty situations.
42 Event planning	Planning and management processes related to an event.
5. Other	
51 Frequent user management program	Aims to provide frequent triple zero callers with support and advice to manage their conditions and make appropriate referrals before an emergency exacerbation.
52 Virtual care program	Aims to divert non-emergency calls from emergency responses by delivering specialised clinical secondary triage and referral at the point of call.
53 Building resilient communities	Partnering with communities and others to help communities better withstand natural disasters and other emergencies when they occur.
54 External training	First responder training to Fire and Rescue NSW.

Implications for the future

- Possible to apply ABF principles to ambulance services.

- Initial classification.

- Improved efficiency and better use of resources.