Scottish Hospitals Inquiry
Post Oral Evidence Statement
Kathleen Harvey-wood

1. The Inquiry Team has previously obtained a witness statement from you, and you gave evidence to the Inquiry on 18 September 2024.

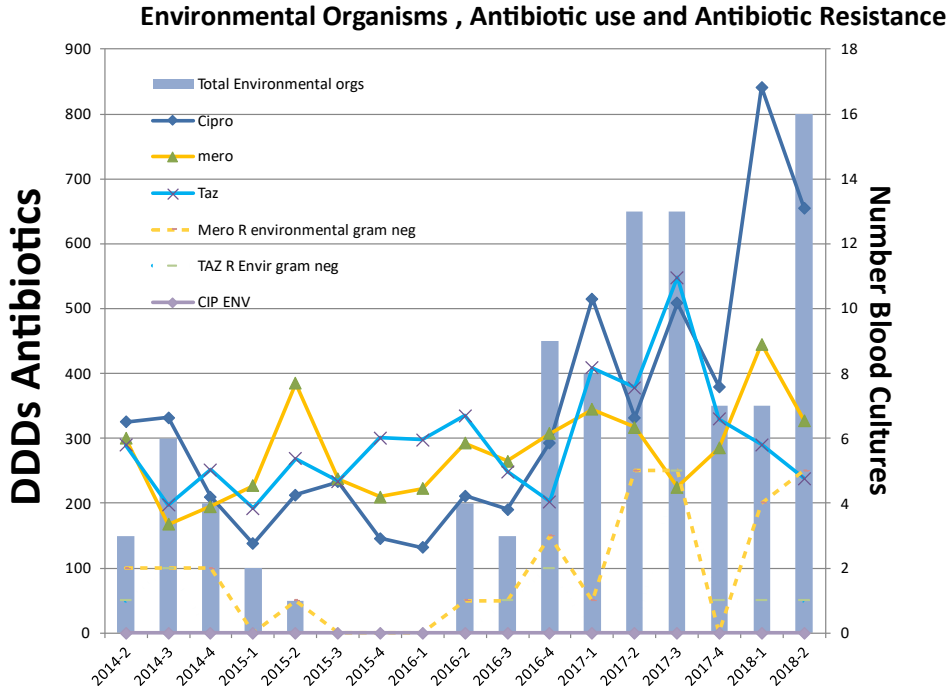
2. After you gave evidence to the Inquiry, the Inquiry took evidence from Professor Alistair Leanord on 9 October 2024. During the course of his evidence, Professor Leanord discussed the use of the antibiotic, Meropenem. Reference was made to a presentation entitled '*Bacteraemia rates and Resistance Paediatric Haemat-oncology 2014-2018*' which you gave along with Dr Christine Peters to haemato-oncology clinicians in 2018. Specifically, Professor Leanord referred to graph 12, which can be found at Bundle 27, Volume 6, page 121.

3. The Inquiry Team would be obliged if you would answer the questions in this supplementary questionnaire by 5pm Tuesday 22 October 2024 at the latest.

4. Those responses will be issued to Core Participants.

Supplementary Questions for Kathleen Harvey-Wood

1. In 2018, you were a joint presenter of a PowerPoint presentation to haemato-oncology clinicians entitled 'Bacteraemia rates and Resistance Paediatric Haemato-oncology 2014-2018' (Bundle 27, Volume 6, page 107). At Bundle 27, Volume 6, page 121 there is a graph entitled 'Environmental Organisms, Antibiotic use and Antibiotic Resistance'. In that regard: Please briefly explain the purpose of preparing this graph.



A. This graph titled "Environmental Organisms, Antibiotic Use and Antibiotic Resistance" in the power point presentation was prepared by Dr Christine Peters, Consultant Microbiologist.

I provided the data for the blood culture results and antibiotic resistance which was obtained from the laboratory telepath system. The DDD data was obtained from Isobel Gourley, Lead Antimicrobial Pharmacist, QEUH.

The graph covers a 4 year period from 2014 Q2 to 2018 Q2. It is prented as quarterly data. The period of 2014 Q2 to 2015 Q2 shows the results for a

year from Yorkhill Hospital before the move to RHC in June 2015.

The left hand axis shows the DDD's (Daily Defined Dose) this is the average standard dose of a drug (antibiotic) to treat an infection. The dotted yellow and blue lines show Meropenem and Tazocin resistant environmental gram negative organisms respectfully.

Right axis shows the number of environmental positive blood cultures which are represented as bar columns.

The aim of this graph was to examine trends of the usage of the antibiotics Meropenem, Tazocin and Ciprofloxacin and the development of antibiotic resistance.

The Meropenem data is for all Haem/Oncol patients and the positive blood cultures are only environmental organisms.

2. With reference to the graph, please provide a brief explanation of what it shows

A. I did not prepare this graph and do not have access to the "raw "data used to produce the graph. However, in answering the question, I have provided my interpretation with information that I have available and an explanation of what the graph shows.

The graph shows that there was a small spike of 6 environmental positive blood cultures in 2014 Q3. This coincided with a low level of Tazocin resistance and a switch to Ciprofloxacin seen as an increase in the DDD's. Of note this increase in environmental blood cultures was a spike which was controlled.

Meropenem and Ciprofloxacin usage was lowest when no infections as seen during the period 2015 Q3 (post move to RHC in June 2015) to 2016 Q1 as there were no environmental positive blood cultures.

During the period 2016 Q2 to 2017 Q2 &3 shows when infections started to rise, note this is an upward trend as noted in my witness statement (Paragraphs 112 and 113).
Tazocin resistance increased in 2017Q3 at the same time as the rise in the number of environmental positive blood cultures, so this meant a move to using Meropenem to treat the bacteraemia's.
The Haemo/Oncology antibiotic policy to treat infection first line antibiotics are Tazocin +/- Gentamicin (1).
If there is no clinical response, patient allergic to Tazocin, antibiogram of infecting organism/s are resistant to Tazocin, then Tazocin is switched to second line therapy antibiotic Meropenem. In some cases where patient is allergic to Tazocin then Meropenem is started as first line therapy.
Tazocin resistance is seen to fall 2017 Q4 and remains static at a low level.

Ciprofloxacin is used to treat environmental infections resistant to both Tazocin and Meropenem and also as a prophylactic antibiotic. Ciprofloxacin DDD increased due to prophylaxis usage related to the 2017 infections peak with a further increase in Ciprofloxacin DDD in 2018 Q1. However, there was no Ciprofloxacin resistance seen in the environmental organisms as shown in the flat line on the graph.

Meropenem DDD related to environmental infection decreased after the move to RHC and remained static, with a peak in 2018 Q1.
Meropenem resistant gram negative (yellow dotted line) highest during the period 2017 Q2 & Q3 and 2018 Q2.
The graph shows that in the period 2018 Q1 = 7 environmental positive blood cultures, 2018 Q2 = 16 environmental positive blood cultures.

In a previous graph from the PowerPoint presentation on page 120: "Total Blood Cultures, total resistant, total antibiotic use" shows the total number of positive blood cultures (Bundle 27, Volume 6, page 120, see also ref 2).
This graph shows that in 2018-Q2 there was a fall in resistance to all the antibiotics and total antibiotic DDD and the total number of positive blood

cultures were also reduced**.**
2018 Q1 = 42 which includes the March 2018 water incident correlating with the increase DDD use of Meropenem during 2018 Q1 (Jan - March 2018). The total number of positive blood cultures then falls in 2018 Q2 = 32.

3. Please explain whether the graph supports the proposition that the prescription of Meropenem is a cause of the spikes in infections?

A. My interpretation of the graph is that the prescription of Meropenem does not support the proposition that it is a cause of the spikes in infections.

Meropenem usage increased as a second line antibiotic in response to infections. Meropenem DDD use did fluctuate and was not on a continuous upward trend.

Meropenem was prescribed on a case by case basis and following antibiotic policy (1). If you look at Meropenem use 2018 Q1 DDD is 420, which falls during 2018 Q2 to 320.

Of interest in period 2018 Q1- 3 patients isolated Stenotrophomonas (all in March) from blood cultures and in period 2018 Q2 there was 3 patients isolated Stenotrophomonas maltophilia from blood cultures.
So, there is no increase in the incidence of Stenotophononas maltophilia infections due to Meropenem in 2018 Q2.

The spikes in infections were due to diverse environmental organisms and the infections were mixed ie polymicrobial which cannot be attributed to Meropenem alone.

Not all the environmental infections were Meropenem resistant organisms. Resistance can be influenced by other factors eg bacteria acquiring plasmids eg genetic – resistance genes, mutations. The high burden of environmental organisms increases the risk of infection and there was an

overall increase in environmental infections independent of the use of Meropenem.

2018 Q1 shows a peak of both Cipro DDD and Mero DDD so the usage of both antibiotics increased. This shows that the spike in infections is not due to the over prescribing of one antibiotic.

4. Are you aware of any published material which discusses this issue? If so, please identify it and if possible, attach copies or links to your reply.

A.

i. Management of Neutropenia and fever: antibiotic policy. (HAEM-ONC-003) **(Bundle 8, supplementary documents Hearing commencing 12th June 2023 document 4)**

ii. Bacteraemia rates and Resistance, Paediatric Haemat-Oncology, 2014- 2018 Report. Dr Christine Peters, Kathleen Harvey-Wood. (**Bundle 27 Volume 6 page 107)**

iii. Audit of Meropenem usage Haematology/Oncology patients RHC produced by Dr Alison Balfour, Consultant Microbiologist.

Declaration

5. I believe that the facts stated in this witness statement are true. I understand that proceedings for contempt of court may be brought against anyone who makes, or causes to be made, a false statement in a document verified by a statement of truth without an honest belief in its truth.

Appendix A

6. The witness was provided access to the following Scottish Hospital Inquiry bundles/documents for reference when they completed their questionnaire/ statement (Appendix A)

A43808275 – Management of Neutropenia and Fever ; antibiotic policy Bundle 8 Document 4

A50071192 - Bacteraemia rates and Resistance Paediatric Haemato-oncology 2014-2018 - Bundle 27, Volume 6, page 107

A50071192 - Environmental Organisms, Antibiotic use and Antibiotic Resistance - Bundle 27, Volume 6, page 121