Antibiotic use in Scotland - update

William Malcolm
Clinical Lead for Scottish One Health Antimicrobial Use and Antimicrobial Resistance Team
Health Protection Scotland

w.malcolm@nhs.net
Contents

Our vision for antimicrobial resistance in 2040 ................................. 2
Antimicrobial resistance today ......................................................... 3
Ambitions for change ..................................................................... 8
Making change happen .................................................................... 13
Ready, willing and engaged .............................................................. 15
References ....................................................................................... 19
Executive summary

Antimicrobial resistance (AMR) is a global problem that impacts all countries and all people, regardless of their wealth or status. The scale of the AMR threat, and the need to contain and control it, is widely acknowledged by country governments, international agencies, researchers and private companies alike.

This document sets out the UK’s 2019–2024 national action plan to tackle AMR within and beyond our own borders. Developed in consultation with a broad range of stakeholders across different sectors, it builds on the achievements of our last strategy (2013–2018), and is aligned with global plans and frameworks for action.

The plan has ultimately been designed to ensure progress towards our 20-year vision on AMR, in which resistance is effectively contained and controlled. It focuses on three key ways of tackling AMR:

- reducing need for, and unintentional exposure to, antimicrobials;
- **optimising use of antimicrobials;** and
- investing in innovation, supply and access.
Contained and controlled
The UK’s 20-year vision for antimicrobial resistance

These are underpinned by actions across 15 ‘content areas’, ranging from reducing infection and strengthening stewardship to improving surveillance and boosting research. The plan also sets out four measures of success to ensure progress towards our 20-year vision. These include, among others, targets to:

- halve healthcare associated Gram-negative blood stream infections;
- reduce the number of specific drug-resistant infections in people by 10% by 2025;
- **reduce UK antimicrobial use in humans by 15% by 2024**;
- reduce UK antibiotic use in food-producing animals by 25% between 2016 and 2020 and define new objectives by 2021 for 2025; and
- be able to report on the percentage of prescriptions supported by a diagnostic test or decision support tool by 2024.
10 October 2019

Dear Colleagues

**Standards on Healthcare Associated Infections and Indicators on Antibiotic Use**

On 24 January 2019, the UK government published a 20-year vision for AMR and a 5-year national action plan for tackling AMR (2019-24). These documents were developed collaboratively by a UK High Level Steering Group which included officials from all four UK countries. The UK plan set ambitious targets to reduce inappropriate prescribing of antibiotics and to reduce healthcare associated Gram-negative bacteraemia. The Scottish Government agreed in principle to endorse reductions in prescribing and Gram-negative bacteraemia in line with the UK national action plan, but reserved the right to set standards at levels that were appropriate for Scotland.

The new Standards and Indicators have been approved by the Cabinet Secretary for Health and Sport, and are attached at Annex A. They build on work by expert groups such as Health Protection Scotland and the Scottish Antimicrobial Prescribing Group.

I trust these standards and indicators provide useful benchmarks to support a local quality improvement framework as we take forward our important work to prevent and control healthcare associated infections and to contain antimicrobial resistance. We recognise that Boards may need time to develop and test effective interventions to support implementation of these standards and indicators. I look forward to working with you in this process.

Kind regards

Fiona McQueen
Chief Nursing Officer

St Andrew's House, Regent Road, Edinburgh EH1 3DG
www.gov.scot
ANNEX A: Updated HCAI standards and antibiotic use indicators for Scotland

Antibiotic use indicators

1. A 10% reduction of antibiotic use in Primary Care (excluding dental) by 2022, using 2015/16 data as the baseline (items/1000/day).
2. Use of intravenous antibiotics in secondary care defined as DDD / 1000 population / day will be no higher in 2022 than it was in 2018.
3. Use of WHO Access antibiotics (NHSE list) ≥60% of total antibiotic use in Acute hospitals by 2022.
Will be published Tuesday 12 November 2019
SONAAR - key highlights

Total antibiotic use

There has been a **6.2%** decrease in antibiotic use between **2014** and **2018**

58.5% of antibiotics use in humans were **Access (first line) antibiotics**

Total breakdown of antibiotic use in humans in **2018**

- **73.5%** in Primary care
- **2.7%** in Secondary care
- **6.3%** in Dentists
- **0.5%** in Pharmacists
- **14.1%** in Non-acute hospital
- **2.9%** in Acute hospital
- **2.9%** in Medical
- **2.9%** in Nurses
SONAAR - key highlights

Antibiotic use in primary care

There has been a 10.2% decrease in antibiotic use in primary care between 2014 and 2018.

27.3% of the Scottish population had at least one course of antibiotics in 2018.

Nurses account for 1 in 10 antibiotic prescriptions.

Over 75% of antibiotic prescriptions were Access (first line) antibiotic items.
SONAAR - key highlights

Antibiotic use in acute hospitals

There has been a 16.0% increase in antibiotic use in acute hospitals in the last five years.

Intravenous antibiotics accounted for 30% of antibiotic use in acute hospitals.

59.7% of antibiotic use in acute hospitals were Access (first line) antibiotics.
NHS Scotland acute hospitals
Access antibiotics use Q1 2017 - Q2 2019

Access Antibiotics as a proportion of all antibiotic (Acute hospitals) DDD

<table>
<thead>
<tr>
<th>Year Q</th>
<th>2017 Q1</th>
<th>2017 Q2</th>
<th>2017 Q3</th>
<th>2017 Q4</th>
<th>2018 Q1</th>
<th>2018 Q2</th>
<th>2018 Q3</th>
<th>2018 Q4</th>
<th>2019 Q1</th>
<th>2019 Q2</th>
</tr>
</thead>
<tbody>
<tr>
<td>%</td>
<td>52.0</td>
<td>54.0</td>
<td>56.0</td>
<td>56.0</td>
<td>57.0</td>
<td>57.0</td>
<td>57.0</td>
<td>56.0</td>
<td>56.0</td>
<td>58.0</td>
</tr>
</tbody>
</table>
NHS Scotland acute hospitals
Access antibiotics use Q2 2019

Proportion access per board against national target (60%)
NHS Scotland all hospitals
IV antibiotic use (DDD/1000pop/day) Q1 2017 - Q2 2019

Rate of IV - DDD per 1000 population per day
NHS Scotland all hospitals
IV antibiotic use (DDD/1000pop/day) 2018

IV - DDD per 1000 population per day by board (2018 totals)
The Antimicrobial Resistance and Healthcare Associated Infection (ARHAI) dashboard presents a wide range of ARHAI information in a single dashboard, facilitating accessible views of comparative information for analysis by NHS Board. The dashboard provides a range of indicators and information on HAI Surveillance, Antimicrobial Resistance (AMR), Antimicrobial Use (AMU), Infection Prevention and Control (IPC), Flu vaccine uptake and Antimicrobial Stewardship, to identify areas of good practice or for potential improvement.

**Indicators Dashboards**

**Healthcare Association Infection (HAI) Surveillance**
- Clostridium difficile infection (CDI), Escherichia coli bacteriaemia (ECB) and Staphylococcus aureus bacteriaemia (SAB) quarterly Healthcare & Community rates, CDT Testing Rates, Surgical Site Infection (SSI) incidence, and Carbapenemase Producing Enterobacteriaceae (CPE) counts.

**Antimicrobial Resistance (AMR)**
- Escherichia coli, Klebsiella pneumoniae and Pseudomonas aeruginosa, antimicrobial resistance and testing percentages for selected antimicrobials.

**Antimicrobial Use (AMU)**
- Rate of Primary Care prescribing per 1000 time adjusted population. Rate of Acute Care prescribing per 1000 Acute Hospital Total Bed Days for selected antimicrobials, and percentages of each as a proportion of the total within Primary and Acute care respectively.

**Infection Prevention & Control (IPC)**
- Sales of Alcohol Based Hand Rub (ABHR) in litres to each healthboard, as a rate per 1000 Total Occupied Bed Days, and Counts of Healthcare Incidents & Outbreaks reported by NHS Health Boards to HPS.

**Flu Vaccine Uptake in Healthcare Workers**
- Seasonal data of the percentage of frontline, non-frontline and all staff who received a flu vaccination within each winter flu season.

**Antimicrobial Stewardship**
- Rates of newly registered Antimicrobial Guardians by NHS Board of Residence, rate per 100,000 Population.

**Enhanced Data Dashboards**

**Healthcare Associated Infections Quarterly Analysis**
- Supplementary dashboard to the Quarterly Epidemiological Report on CDI, ECE, SAB and SSI, with board comparisons, time seasonality, funnel plots and IPI charts.

**Enhanced S. aureus Bacteriaemia Surveillance**
- Enhanced surveillance data or SAB infections across Scotland NHS Board and Hospital rates, breakdown of entry point and risk factor data, by origin of infection.

**Enhanced E.coli Bacteriaemia Surveillance**
- Enhanced surveillance data on ECB Infections across Scotland NHS Board and Hospital rates, breakdown of sources and spp bacteriaemia, by origin of infection.

**C. difficile infection Surveillance Report**
- Surveillance data on CDI across Scotland: NHS Board and Hospital rates of CDI.

**Surgical Site Infection Surveillance Report**
- Surveillance data on SSI across Scotland: NHS Board and Hospital Incidence of SSI, with SSI types.

**Healthcare Infection Incidents, Outbreaks and Data Exceedance Reported by NHS Scotland**
- Breakdown of Incidents & Outbreaks by HIAI Status, Infection Category and Organism Group, as reported by NHS Scotland.

**Antimicrobial Use Scorecard - Cumulative Data**
- Antimicrobial Use Scorecard showing data for different antibiotics and their usage over time.

**Antimicrobial Use Timeline - All Scotland**
- Timeline graph showing the usage of antimicrobial drugs over different years and quarters.
The three ages of antimicrobial stewardship in Scotland

‘what to prescribe’
Reducing the use of certain broad-spectrum antibiotics due to their association with antimicrobial resistance and Clostridioides difficile infection

‘whether to prescribe’
Reducing the use of antibiotics for common self-limiting infections where antibiotics are seldom required in healthy individuals

‘for how long to prescribe’
Encouraging the use of short courses where indicated
Duration of treatment in primary care. What does the national data tell us?

Most prescriptions for antibiotics are for seven days.
Duration of treatment in primary care. What does the national data tell us?
Sales of antibiotics for use in food-producing animals, adjusted for animal population (mg/kg), 2014-2018

Source: p. 7
VARSS REPORT 2018
Trends of antibiotic sales by highest priority critically important antibiotic for use in food-producing animals and adjusted for animal population (mg/kg), 2014-2018

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Fluoroquinolones (mg/kg)</td>
<td>0.35</td>
<td>0.35</td>
<td>0.23</td>
<td>0.15</td>
<td>0.15</td>
<td>↓ 58%</td>
</tr>
<tr>
<td>3&lt;sup&gt;rd&lt;/sup&gt;/4&lt;sup&gt;th&lt;/sup&gt; generation cephalosporins (mg/kg)</td>
<td>0.19</td>
<td>0.17</td>
<td>0.14</td>
<td>0.11</td>
<td>0.06</td>
<td>↓ 66%</td>
</tr>
<tr>
<td>Colistin (mg/kg)</td>
<td>0.12</td>
<td>0.12</td>
<td>0.02</td>
<td>0.0006</td>
<td>0.0007</td>
<td>↓ 99%</td>
</tr>
<tr>
<td>Total HP-CIAs (mg/kg)</td>
<td>0.67</td>
<td>0.64</td>
<td>0.38</td>
<td>0.26</td>
<td>0.21</td>
<td>↓ 68%</td>
</tr>
</tbody>
</table>

Source: p. 7
VARSS REPORT 2018
Antibiotic resistance is one of the biggest threats facing us today.

**Why it is relevant to you:** without effective antibiotics, many routine treatments will become increasingly dangerous. Setting broken bones, basic operations, even chemotherapy and animal health all rely on access to antibiotics that work.

**What we want you to do:** To slow resistance we need to cut the unnecessary use of antibiotics. We invite the public, students and educators, farmers, the veterinary and medical communities and professional organisations, to become Antibiotic Guardians.

**Call to action:** Choose one simple pledge about how you'll make better use of antibiotics and help save

https://antibioticguardian.com/

**Acknowledgments**

Scottish One Health Antimicrobial Use and Antimicrobial Resistance Team