

1 **AMR data at your Fingertips: revolutionising feedback of surveillance of**  
2 **antimicrobial consumption and resistance in England**

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19 Short running title: AMR data on Fingertips

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21 Abstract

22 The provision of better access to and use of surveillance data is a key  
23 component of the UK five-year antimicrobial resistance (AMR) strategy. Since  
24 April 2016, PHE has presented data on process (infection prevention and  
25 control; and antimicrobial stewardship) and outcome (AMR; antibiotic use; and  
26 healthcare-associated infection) indicators related to the AMR strategy  
27 through Fingertips, a publicly accessible web tool. Fingertips provides access  
28 to a wide range of public health data presented as thematic profiles, with the  
29 above data at the level of National Health Service acute trusts, Clinical  
30 Commissioning Groups or general practitioner practices being available  
31 through the “AMR local indicators” profile. Commissioner and Provider  
32 organisations can be compared to the corresponding aggregate values for  
33 England to allow benchmarking, using a number of different visualisations  
34 including, counts and rates, interactive maps, spine charts and graphs that  
35 show temporal trends over a range of time to measure the impact of quality  
36 improvement programmes. The aim of the AMR local indicators profile on  
37 Fingertips is to support local action by healthcare organisations to reduce  
38 inappropriate prescribing, AMR and healthcare-associated infections by  
39 ensuring that relevant data are made readily available in an easy to use  
40 format. By sharing these data transparently and openly, PHE aims to  
41 stimulate cross-organisational working and learning that may assist local and  
42 national efforts to tackle the major public health threat posed by antibiotic  
43 resistance.

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45 **Background**

46 The UK five year antimicrobial resistance (AMR) strategy, published in 2013,  
47 lists seven key areas for action, one of which is “better access to and use of  
48 surveillance data”.<sup>1</sup> PHE operationalized this through formation of a cross-  
49 organisation working group, the English Surveillance Programme for  
50 Antimicrobial Use and Resistance (ESPAUR). Initial work focussed on  
51 improving the quality and quantity of data on antimicrobial use and resistance  
52 and publishing annual reports.<sup>2</sup> Since April 2016, these data together with  
53 additional relevant healthcare-associated infection and infection prevention  
54 and control data have been made available through Fingertips, a publicly  
55 accessible web tool maintained by PHE. Fingertips provides access to a wide  
56 range of public health data presented as thematic profiles, with the above  
57 data being available through the “AMR local indicators” profile.<sup>3</sup> Each dataset  
58 is available in a range of visualisations including an overview showing counts  
59 and rates, interactive maps, spine charts demonstrating how one area  
60 compares with –the national or subnational benchmark across a range of  
61 health indicators and graphs that show temporal trends or allow correlations  
62 between pairs of indicators.<sup>3</sup> The data are variably presented over a range of  
63 time scales including financial year, quarter or month. A user guide is  
64 available for download and a “Definitions” tab in the system provides  
65 comprehensive information about each indicator and the rationale for  
66 inclusion. For advanced users wishing to manipulate and perform their own  
67 analysis on the data behind the fingertips visualisations, a download function  
68 is provided.

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71 **AMR local indicators**

72 The Fingertips AMR local indicators profile comprises five domains (displayed  
73 to the user as tabs): AMR, antibiotic prescribing, healthcare-associated  
74 infection, infection prevention and control and antimicrobial stewardship. A  
75 further domain is included designed to bring together data from the five  
76 domains relevant to NHS England Initiatives aimed at tackling AMR. Data on  
77 a range of indicators can be viewed at the level of National Health Service  
78 (NHS) acute trusts (groups of hospitals under the same management),  
79 Clinical Commissioning Groups (CCGs; clinically-led statutory NHS bodies  
80 responsible for the planning and commissioning of healthcare services for  
81 their local area) or general practitioner (GP) practices (primary care delivered  
82 by GPs and other healthcare workers), all of which can be compared to the  
83 corresponding aggregate values for England. In addition to being visible on  
84 screen, all data may be downloaded as Excel files to allow further analysis,  
85 including comparing against peer groups of an organisation's choice. The  
86 data presented are derived from available sources including NHS Digital,<sup>4</sup> the  
87 national mandatory surveillance schemes for *Clostridium difficile* infection  
88 (CDI) and *Escherichia coli* and staphylococcal bacteraemia,<sup>5</sup> surgical site  
89 infection surveillance schemes,<sup>6</sup> PHE curated microbiology laboratory  
90 information management systems,<sup>7</sup> healthcare worker influenza surveillance,<sup>8</sup>  
91 NHS Business Service Authority and acute trust data submitted as part of  
92 NHS England's AMR Commissioning for Quality and Innovation (CQUIN).<sup>9</sup>

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94 As of October 2016, data for a total of 70 quality indicators were available,  
95 with the breakdown of data by trust, CCG or GP practice shown in Table 1.  
96 The data items in each domain are outlined below:

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98 *AMR domain*

99 AMR indicators include rates of MRSA bacteraemia (by trust and CCG), the  
100 proportions of *E. coli* from blood tested for susceptibility to a range of key  
101 antibiotics (by CCG) and the proportion of *E. coli* and non-speciated coliforms  
102 isolated from urinary specimens taken in the community that are tested and  
103 found resistant to trimethoprim and nitrofurantoin.

104 *Antibiotic prescribing domain*

105 Prescribing indicators include: (a) DDDs of all antibiotics,  
106 piperacillin/tazobactam and carbapenems dispensed by acute trusts per 1000  
107 admissions and per 1000 occupied bed-days; (b) quarterly and 12-month  
108 rolling CCG data for total number of prescribed antibiotic items in all primary  
109 care settings per 1000 residents and per STAR-PU (age and sex adjusted  
110 denominators) and the proportion that are broad-spectrum; (c) quarterly GP  
111 practice data on numbers of prescribed antibiotic items per 1000 registered  
112 patients and per STAR-PU and the proportion that are broad-spectrum.

113 *Healthcare-associated infection domain*

114 This domain includes rates and counts for CDI and bacteraemia caused by *E.*  
115 *coli*, MRSA and MSSA by CCG or trust as well as hospital-onset *E. coli*  
116 bacteraemia and orthopaedic (hip and knee) surgical site infections by trust.

117 *Infection prevention and control domain*

118 The Indicators for the IPC domain include the proportion of single rooms (both  
119 with and without en-suite facilities) in acute trusts, the trust PLACE (patient-  
120 led assessments of the care environment) cleanliness scores and the % of  
121 frontline healthcare workers in each acute trust vaccinated against seasonal  
122 influenza.

123 *Antimicrobial stewardship domain*

124 These Indicators include the outcomes of trust reviews of the Start Smart  
125 Then Focus antimicrobial stewardship toolkit and implementation of  
126 antimicrobial stewardship action plans in NHS Trusts and the numbers of  
127 Antibiotic Guardians per 100,000 CCG population.

128 **Making use of the data**

129 *Sustainability and Transformation Plans (STPs)*

130 In December 2015, the NHS outlined a new approach to ensuring healthcare  
131 delivery was centered on the needs of local populations, based around local  
132 development of STPs that cover a range of healthcare issues including local  
133 actions to AMR through improved antibiotic stewardship and reducing rates of  
134 infection.<sup>10</sup> The provision of data relating to AMR local indicators via  
135 Fingertips will be a valuable tool for facilitating development, implementation  
136 and monitoring of local action plans for tackling AMR.

137 *Supporting NHS England commissioning initiatives*

138 To support the national AMR strategy, NHS England has introduced Quality  
139 Premiums (2015/16) and the CQUIN (Commissioning for Quality and  
140 Innovation (2016/17) payments framework to reduce total and broad-spectrum  
141 prescribing in primary and secondary care. From 2017 to 2019 the Quality  
142 Premium will also include ambitions to reduce Gram-negative bloodstream  
143 infections across the healthcare economy, while focussing on improving  
144 compliance with PHEs evidence based urinary tract infection treatment  
145 guidelines to reduce empiric trimethoprim and increase nitrofurantoin  
146 prescribing. During the same period the CQUIN will continue to focus on  
147 reducing total prescribing and broad-spectrum (carbapenems and piperacillin-  
148 tazobactam) antibiotics in acute trusts while focussing stewardship teams on  
149 reviewing antibiotic prescriptions - usually empiric broad-spectrum - for  
150 potential sepsis within the organisation.

## 151 **Conclusion**

152 The aim of the AMR local indicators profile on Fingertips is to support action  
153 by organisations to reduce inappropriate prescribing, AMR and healthcare-  
154 associated infections by ensuring that relevant data are made available in an  
155 easy to understand format. By sharing these data transparently and openly,  
156 PHE aims to stimulate cross-organisational working and learning that may  
157 assist in our aim of preserving antibiotics for future generations.

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195 **Table 1.** Number of AMR local indicators available on the PHE Fingertips web  
196 portal as of October 2016

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Domain	No of indicators available at indicated geographies		
	Acute Trust	CCG	GP
Antimicrobial Resistance	1	10	-
Antibiotic prescribing	6	7	4
Healthcare-associated infections	21	14	-
Infection prevention and control	4	-	-
Antimicrobial stewardship	2	1	-

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