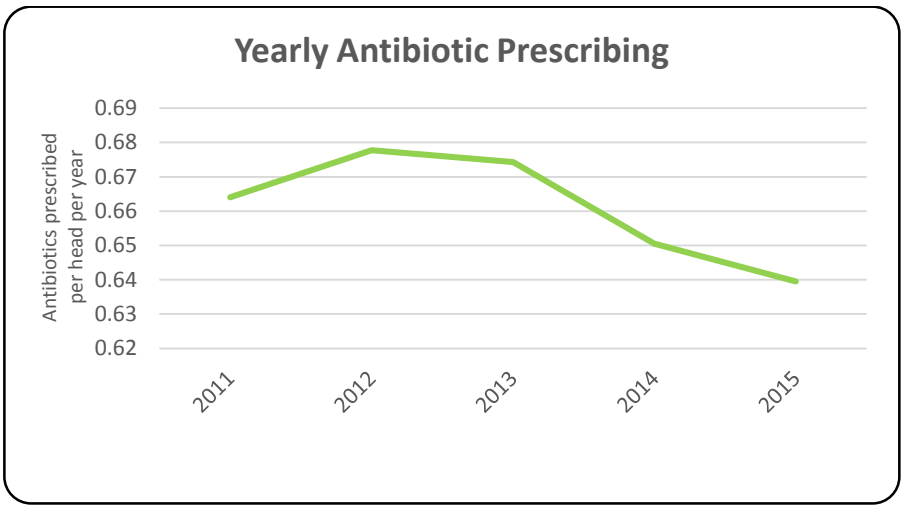
New research reveals that antibiotic prescriptions are rising in the most deprived areas of England

Antibiotic Research UK and EXASOL release antibiotic prescription data findings by number of items and heatmaps ahead of European Antibiotic Awareness Day on 18th November and The Great British Tea Party.

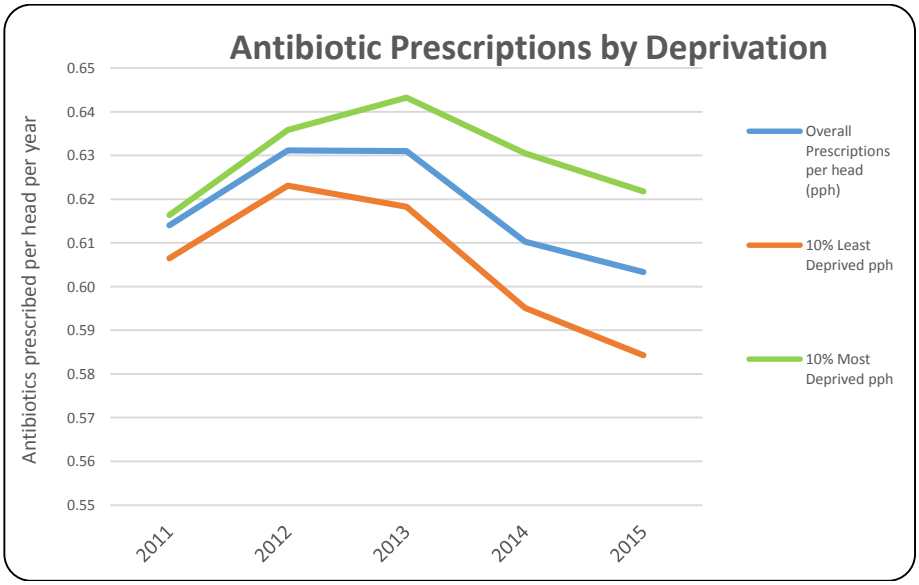
Key findings include:

- *There is a widening deprivation gap: The gap between prescriptions in the least and most deprived areas of England is widening and the difference in prescribing between the bottom and top 1% by deprivation is 20%*
- *Greater London doctors prescribe 21% fewer antibiotics than the North. The data also reveals that the most deprived coastal towns in Lincolnshire, Norfolk and Essex are prescribing the most antibiotics in the country, with Clacton-on-Sea, the UK's most deprived area, almost twice the national average.*
- *Doctors prescribe 59% more antibiotics in December than they do in August, despite the fact that many of the illnesses treated by antibiotics are not seasonal.*
- *Prescriptions per head peaked in 2012 with a total of 3.8 million prescriptions to English patients, but have dropped 5.6% since.*

12th November 2015: New research by Antibiotic Research UK, the world's first charity created to develop new antibiotics in the fight against superbugs, and high-performance analytic database company EXASOL has discovered that while the number of antibiotic prescriptions is coming down across England, GP practices in the most deprived parts of the country are prescribing 20% more and, worryingly, antibiotic prescriptions are on the increase in these deprived areas. For instance, in Clacton-on-Sea, the UK's most deprived area, we see antibiotic prescribing rates of almost twice the national average.



Source: EXASOL using Primary Care data

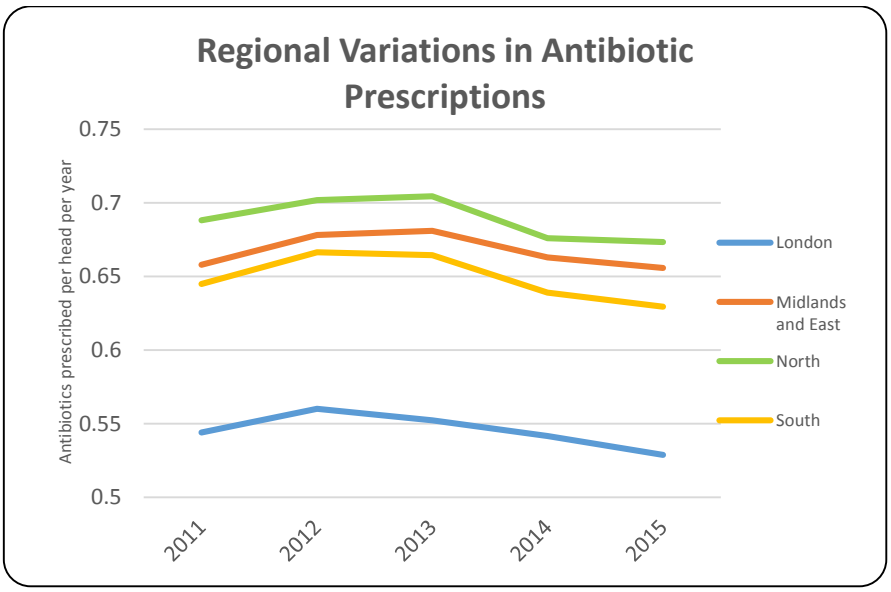


Source: EXASOL using Primary Health Care data

Antibiotic Research UK and EXASOL analysed data released by the Government's Health and Social Care Information Centre and sourced from the NHS Business Services Authority. The data runs over 5 years from August 2010 to July 2015 and contains 602 million rows of data. The data was analysed by a data scientist working for EXASOL, using its high performance in-memory analytic database. The data reveals antibiotic prescribing hotspots and interesting correlations against areas of deprivation. It also shows seasonal variation in antibiotic prescribing. The data is grouped by Lower Layer Super Output Areas (LSOA)*.

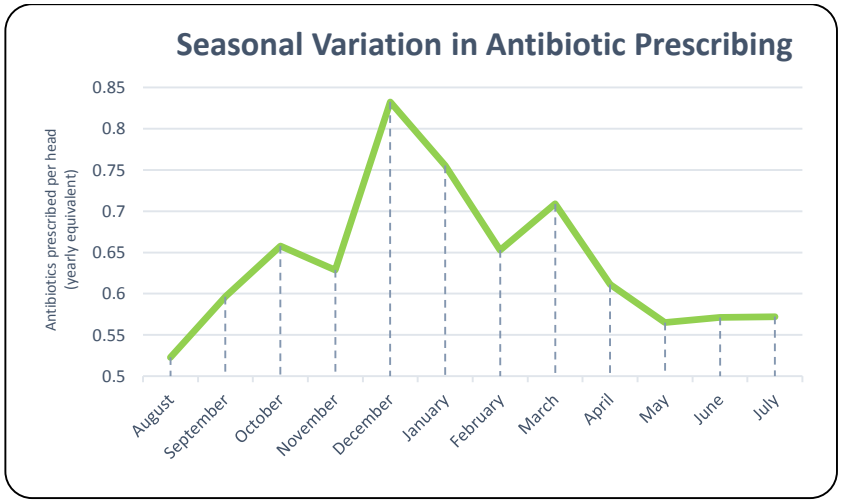
Sean Jackson, chief marketing officer (CMO), EXASOL says: *"When analysing the data we are seeing a widening deprivation gap in antibiotic prescriptions. The gap between prescriptions in the 1% least and most deprived areas of England is 20%. We also see significant regional differences, for example London prescriptions are 21% lower than areas in the North."*

Professor Colin Garner, chief executive of Antibiotic Research UK Says: "*Londoners and the Thames Valley region have the best access to healthcare and are also on average younger and healthier than the rest of the country. However, we would not expect to see such a large variation in prescriptions around the country. If we look at the detailed heat map it shows hotspots of antibiotic prescription, more generally around areas of deprivation."*



Regional Variations in Antibiotic Prescriptions (drilling down further). Source: EXASOL using Primary Health Care data

The data also highlighted seasonal variation in prescription levels with 59% more prescriptions in December than in August with no obvious reason. Professor Colin Garner of Antibiotic Research UK says: *"It is true that colds and flus sometimes lead to bacterial infections due to suppressed immune systems and so we would expect a minor increase in antibiotic prescription in the winter months, however the data shows us a 59% jump in four months and this is far too high. One explanation is that patients are requesting antibiotics from their GPs for simple coughs and colds and GPs are acceding to these requests despite the advice they have been given not to prescribe antibiotics for viral conditions such as these."*



Antibiotic prescribing, seasonal variations: August 2014 to July 2015. Source: EXASOL

An increased resistance by bacteria to antibiotics could change surgery as we know it today. As a consequence, new hips, knees, organ transplantation, open heart surgery and many cancer treatments will become high risk. It is estimated that

there are 400,000 cases of reported antibiotic resistant infections with 25,000 deaths each year in the European Union; in the UK the figure is close to 5,000 deaths per year.

Sean Jackson, CMO, EXASOL says: *"Awareness of antibiotics overuse is critical. As an analytic database provider, we firmly believe in the power of data analytics in helping unlock valuable insights that can address any problem or issue. With the right data and the right technology, you can turn any problem into a data problem and uncover information to help address it. We worked with Antibiotic Research UK to find information that is useful in their quest to address antibiotic use and find new antibiotics in the fight against the superbug. To analyse such enormous data-sets fast requires the right tool and we hope the findings help to further reduce this serious issue."*

Ends

Notes to editors:
*LSOA: Lower Layer Super Output Areas are built from groups of contiguous Output Areas and have been automatically generated to be as consistent in population size as possible, and typically contain from four to six Output Areas. The Minimum population is 1000 and the mean is 1500. There is a Lower Layer Super Output Area for each POSTCODE in England.

The Great British Tea Party, 18th November 2016
To fight antibiotic resistance, we need to raise £250,000 and we need your help to reach this target. To co-incide with European Antibiotic Awareness Day, Antibiotic Research UK has launched The Great British Tea Party which will be held on Wednesday 18 November 2015. By hosting a Great British Tea Party you can raise money to help us fund our programmes in education, research and patient support whilst having some fun. We would like you to organise or participate in The Great British Tea Party. To obtain a Fundraising Pack by post please fill in your name and address details on the email request form. The Pack will tell you how to organise an event as well as giving you more information about our Charity and ways in which it can be supported.

Lists of datasets used:
1.Prescribing data from http://www.hscic.gov.uk/gpprescribingdata - a list of all prescriptions given by GPs and subsequently dispensed in England (5 years – from August 2010 to July 2015). This is the largest dataset, amounts to about 602 million rows or 83 GB of uncompressed data. The data is grouped by month, roughly 1 million prescriptions per month.

2.Practice codes, names and addresses (June 2015) – http://www.hscic.gov.uk/article/2021/Website-Search?productid=18541 - a lookup for the addresses of the practices listed above. In total 9,897 practices are listed (England only).

3.Numbers of Patients Registered at a GP Practice (July 2015) http://www.hscic.gov.uk/catalogue/PUB17927 – gives a breakdown of the patients registered with each practice by age, sex, LSOA (lower level super output area – small geographic areas with a maximum population of 1000).

4.English Indices of Deprivation 2010 – a generated index of deprivation by LSOA (32,482 rows) https://data.gov.uk/dataset/index-of-multiple-deprivation/resource/7537209d-aea6-47d6-88db-ba0dcf1d58d4 – notes:
The IMD 2010 was constructed by combining the seven transformed domain scores, using the following weights:
•Income (22.5%)
•Employment (22.5%)
•Health and Disability (13.5%)
•Education, Skills and Training (13.5%)
•Barriers to Housing and Services (9.3%)
•Crime (9.3%)
•Living Environment (9.3%)

About EXASOL

EXASOL is passionate about helping companies to run their businesses smarter and drive profit by analysing data and information at unprecedented speeds.

The company develops the world's fastest database for analytics and data warehousing, and offers first-class know-how and expertise in data insight and analytics. The in-memory analytic database is the first database to combine in-memory, columnar compression and massively parallel processing, and is proven to be the world's FASTEST, topping the list in the TPC-H Benchmark tests for performance.

Companies that depend on EXASolution to analyse their data in real-time include Adidas Group, GfK, IMS Health, King, Olympus, myThings, Sony Music and Xing.

For more information visit us at www.exasol.com and follow us on twitter, facebook, xing, linkedin or on our Blog.

About Antibiotic Research UK

Antibiotic Research UK is the world's first charity to tackle the problem of antibiotic resistant infections. We aim to develop one new antibiotic therapy by the early 2020's with further antibiotics being introduced over the next decade. **To reach our goals we need to raise £30 million over the next 5-7 years.** Antibiotic Research UK has the support of some of the United Kingdom's leading scientific and clinical experts in antibiotic resistance, drawn from 14 of the country's top universities and 12 specialty pharmaceutical or support companies.

The problem of antibiotic resistance (superbugs) has been highlighted by the World Health Organisation, the UK Prime Minister, the President of the USA, the UK Chief Medical Officer Dame Sally Davies and Lord Jim O'Neill, chair of the Government's Review of Antimicrobial Resistance. David Cameron talked about medicine going back to the 'dark ages' if we didn't tackle this impending health disaster. Antibiotic Research UK is a registered charity (no 1157884) and is uniquely placed to develop new therapies which would be made available to all affected by antibiotic resistant infections throughout the world. It's first scientific programme has been developed by the charity's Scientific and Technical Advisory Committee, a a group of national antibiotic resistance experts and further details can be found here - http://www.antibioticresearch.org.uk/for-the-public/
The Great British Tea Party is a major national fundraising drive . More information can be found at http://www.antibioticresearch.org.uk/antruk-great-british-tea-party-18-nov-2015/

A charity registered in England and Wales; Number 1157884
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