

Webinar
gratuito

Antimicrobico-resistenza, cure e ambiente #4

L'Antimicrobico-resistenza nel primo anno della pandemia

MARTEDÌ 8 GIUGNO 2021
ORE 14:30 - 18:30

crediti ECM n. 4



Antimicrobial stewardship e Covid-19

Mario Tumbarello

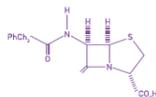
UOC Malattie Infettive e Tropicali



UNIVERSITÀ DI SIENA 1240

ANTIMICROBIAL RESISTANCE

Global Report on surveillance 2014



What you need to know

WHO's first global report on antimicrobial resistance, with a focus on antibiotic resistance, reveals that it is no longer a prediction for the future. Antibiotic resistance - when bacteria change and antibiotics fail - is happening **right now**, across the world



The report is the most comprehensive picture to date, with data provided by 114 countries



Looking at 7 common bacteria that cause serious diseases from bloodstream infections to gonorrhoea



High levels of resistance found in all regions of the world

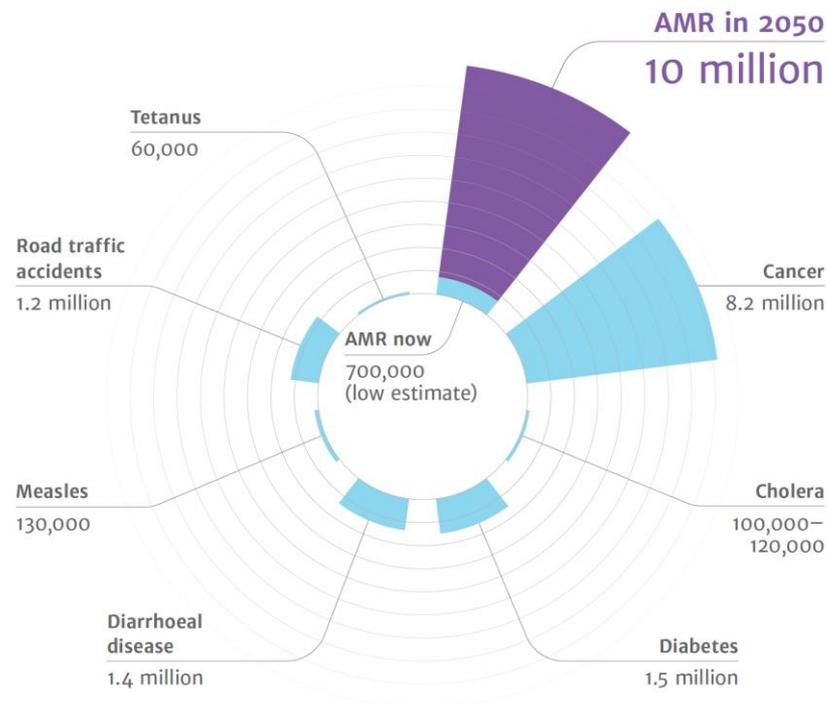


Significant gaps exist in tracking of antibiotic resistance

Over the last 30 years, no major new types of antibiotics have been developed



DEATHS ATTRIBUTABLE TO AMR EVERY YEAR



TACKLING DRUG-RESISTANT INFECTIONS GLOBALLY: FINAL REPORT AND RECOMMENDATIONS

THE REVIEW ON ANTIMICROBIAL RESISTANCE

CHAIRER BY JIM O'NEILL

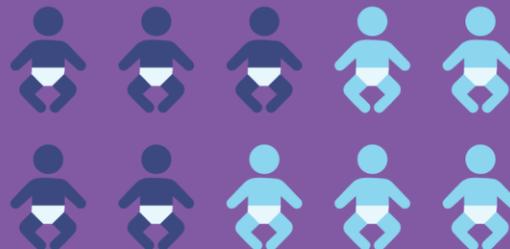
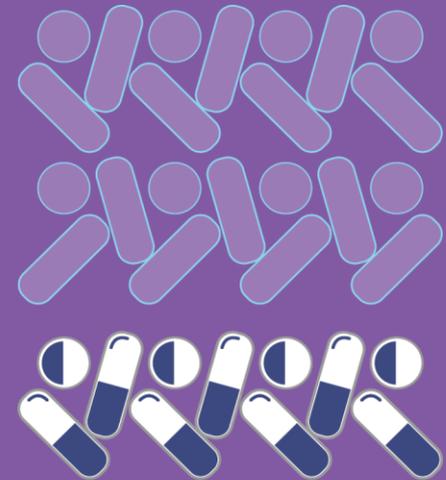
MAY 2016

WE NEED TO USE EXISTING ANTIMICROBIALS BETTER

Improving availability of existing antimicrobials and using better dosing strategies would go a long way in helping current antimicrobials last longer.

2/3rd

A study in 2012 found that 2/3rds of selected antibiotics were not available in more than half the included countries.



1/2

A study in 2015 found that nearly half the children and newborns in the sample were treated with sub-optimal doses of commonly used antifungals.

TACKLING DRUG-RESISTANT INFECTIONS GLOBALLY: FINAL REPORT AND RECOMMENDATIONS

THE REVIEW ON ANTIMICROBIAL RESISTANCE

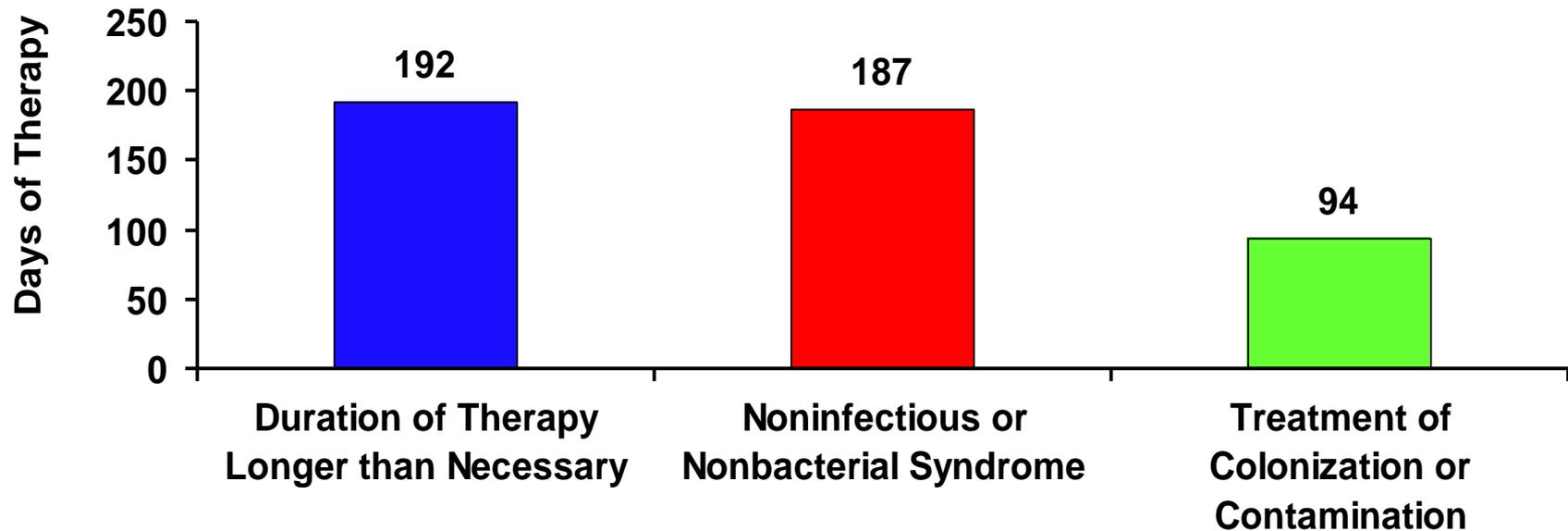
CHAired BY JIM O'NEILL

MAY 2016

Unnecessary Use of Antimicrobials in Hospitalized Patients

- Prospective observational study in ICU
- 576 (30%) of 1941 antimicrobial days of therapy deemed unnecessary

Most Common Reasons for Unnecessary Days of Therapy

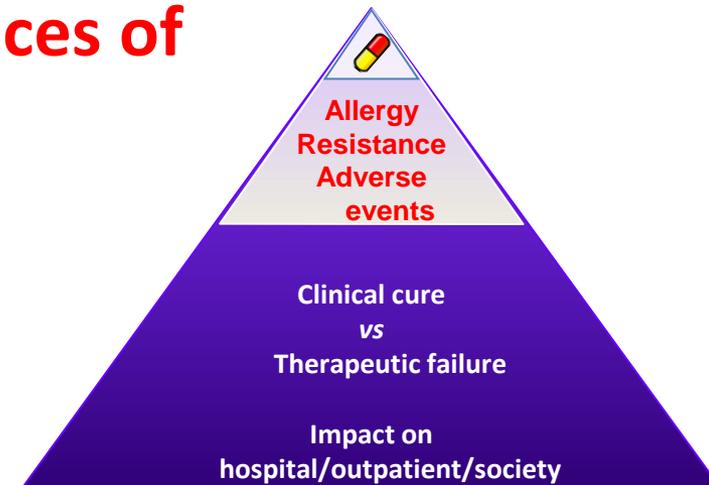


Antimicrobial stewardship is a package of measures to obtain...

- **Primary Goal: to optimize clinical outcomes while minimizing unintended consequences of antimicrobial use**

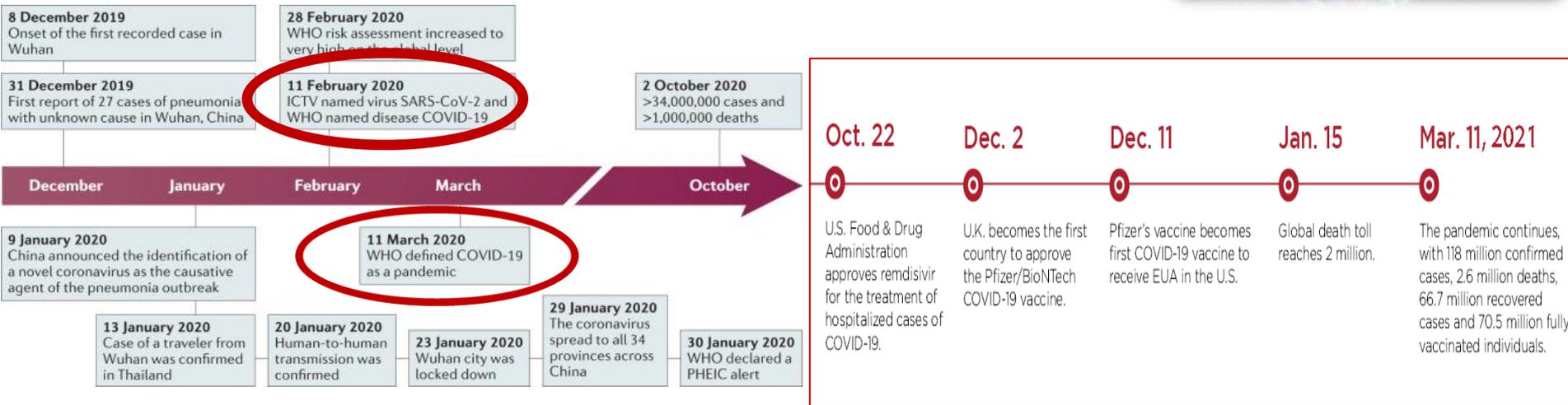
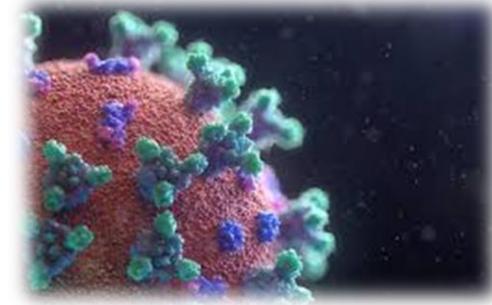
– Consequences

- Toxicity
- Selection of pathogenic organisms
- Emergence of resistant pathogens



- **Secondary goal: to reduce health care costs without adversely affecting the quality of care**

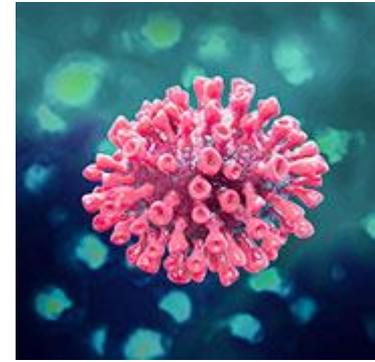
SARS-CoV-2 timeline



American Society for Microbiology. <https://asm.org/Resource-Pages/COVID-19-Resources>

Hu B et al. Nat Rev Microbiol 2020

First studies from China..



- *50% of non-survivors patients with COVID-19 had secondary bacterial infections.. (Zhou et al. Lancet 2020)*
- *The most common of expired patients complication were sepsis.. (Chen et a. BMJ 2020)*
- *The most common complications were bacterial infections.. (Wang et al J. Infect 2020)*

Article

Evolution of Antimicrobial Consumption During the First Wave of COVID-19 Pandemic

Santiago Grau ^{1,2,*} , Daniel Echeverría-Esnal ¹, Silvia Gómez-Zorrilla ³, María Eugenia Navarrete-Rouco ¹ , Joan Ramon Masclans ^{2,4}, Merce Espona ¹, María Pilar Gracia-Arnillas ⁴, Xavier Duran ⁵, Merce Comas ⁶, Juan Pablo Horcajada ³ and Olivia Ferrández ¹

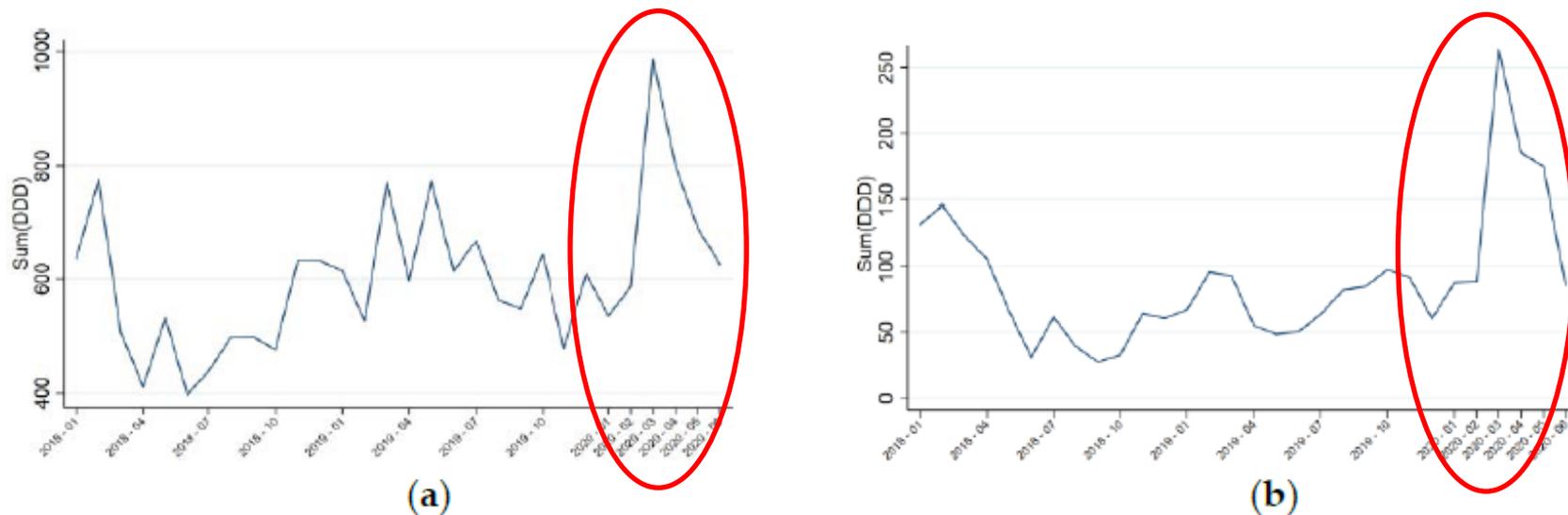


Figure 3. Evolution of global antimicrobial consumption expressed in defined daily doses (DDD)/100 bed-days. (a) Hospital: β -change 124.242, $p = 0.106$; (b) extended-intensive care unit (ICU): β -change 97.960, $p = 0.001$.

Antibiotic prescribing in patients with COVID-19: rapid review and meta-analysis

Bradley J. Langford^{1,2,*}, Miranda So^{3,4,5}, Sumit Raybardhan⁶, Valerie Leung^{1,7}, Jean-Paul R. Soucy⁸, Duncan Westwood⁹, Nick Daneman^{1,4,9,10}, Derek R. MacFadden¹¹



B.J. Langford et al. / *Clinical Microbiology and Infection* 27 (2021) 520–531

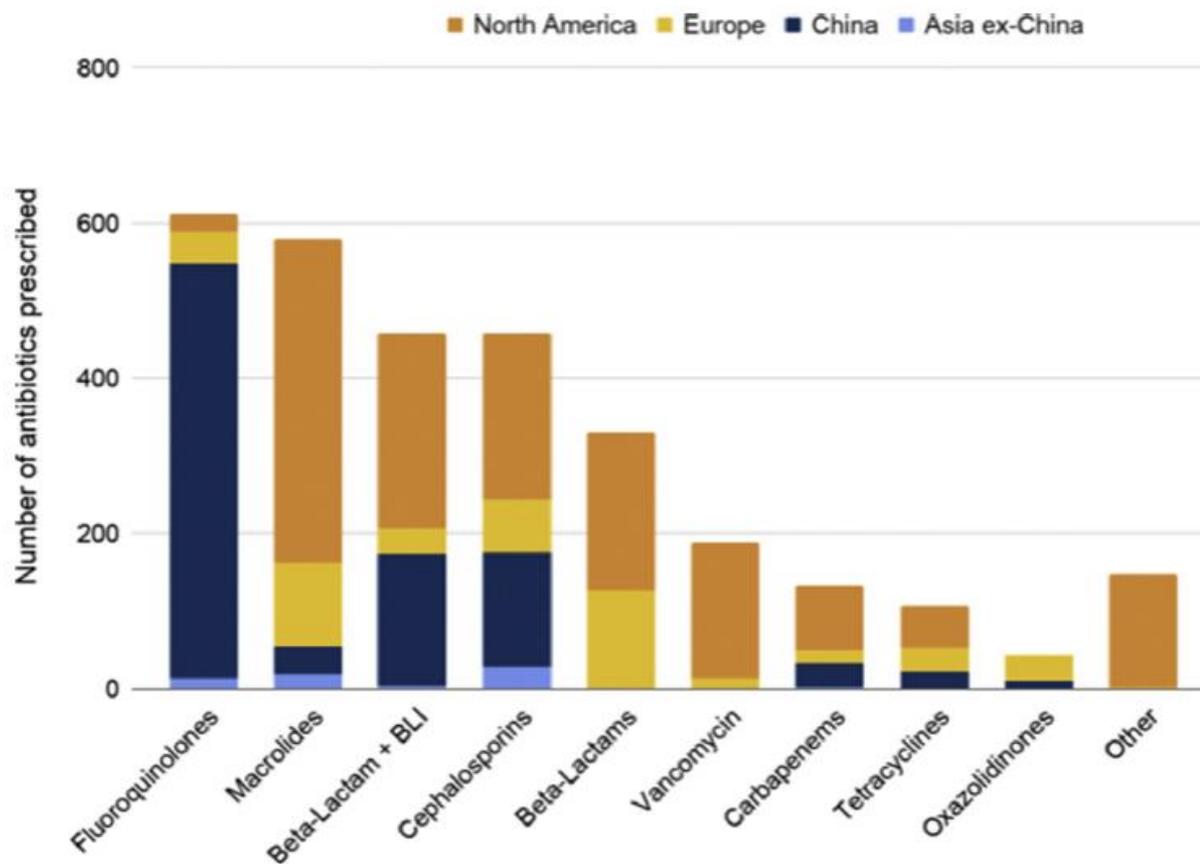


Fig. 2. Classes of antibiotic prescribing in patients with COVID-19 by region. BLI, β -lactamase inhibitor. One course of polymyxins was prescribed in China.

Antibiotic prescribing in patients with COVID-19: rapid review and meta-analysis

Bradley J. Langford^{1,2,*}, Miranda So^{3,4,5}, Sumit Raybardhan⁶, Valerie Leung^{1,7}, Jean-Paul R. Soucy⁸, Duncan Westwood⁹, Nick Daneman^{1,4,9,10}, Derek R. MacFadden¹¹

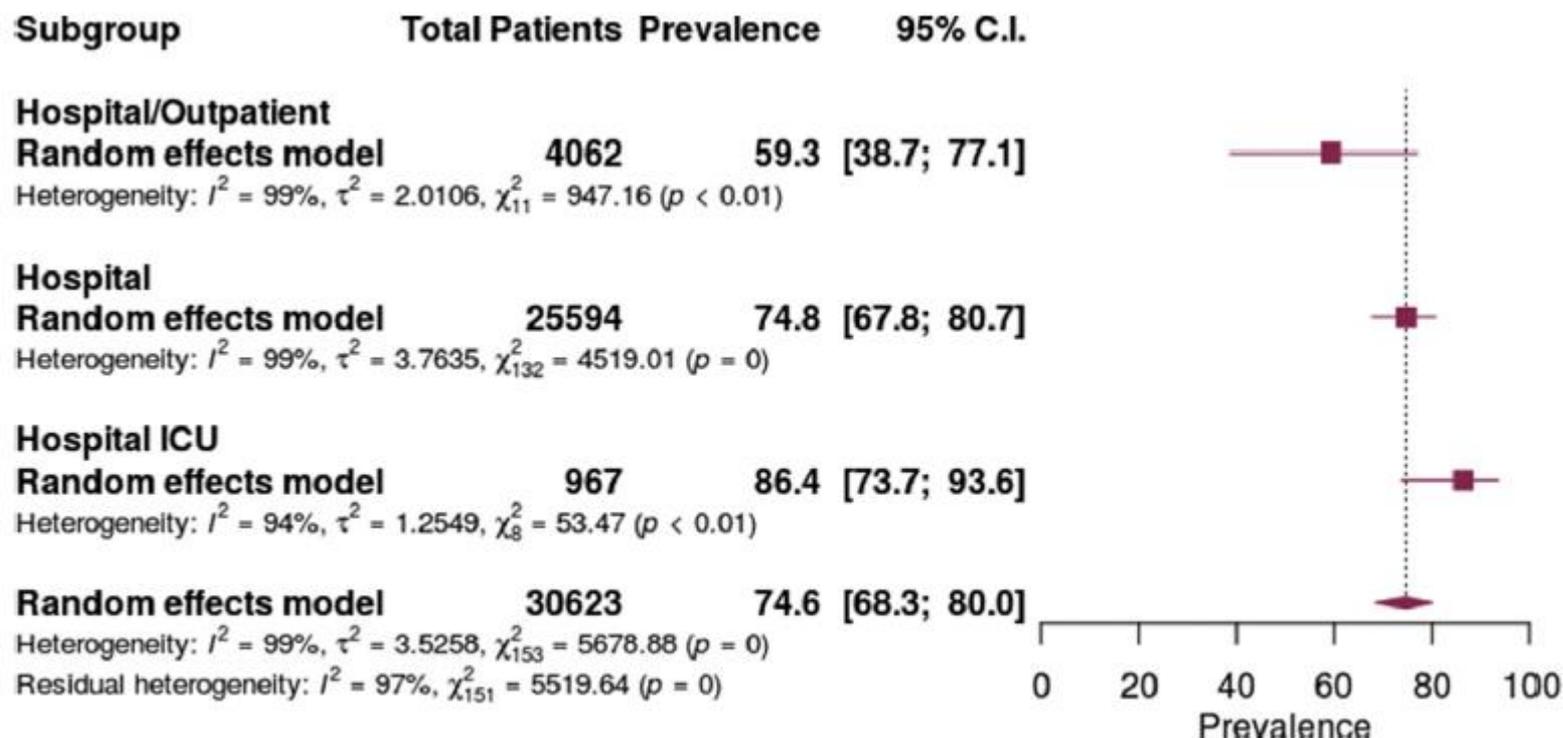
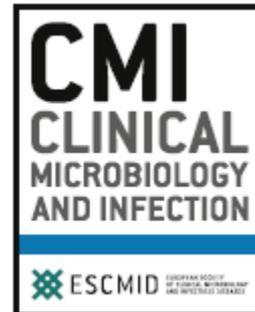


Fig. 5. Antibiotic prescribing in patients with COVID-19 by healthcare setting.

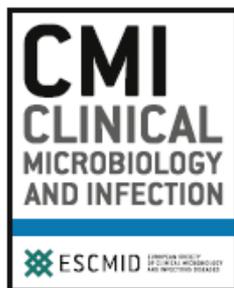
Antibiotic prescribing in patients with COVID-19: rapid review and meta-analysis

Bradley J. Langford^{1,2,*}, Miranda So^{3,4,5}, Sumit Raybardhan⁶, Valerie Leung^{1,7},
Jean-Paul R. Soucy⁸, Duncan Westwood⁹, Nick Daneman^{1,4,9,10}, Derek R. MacFadden¹¹



- The prevalence of antibiotic prescribing was **74.6%**.
- On univariable meta-regression, antibiotic prescribing was lower in children compared with adults.
- Antibiotic prescribing was higher with increasing patient age and higher with increasing proportion of patients requiring mechanical ventilation
- Estimated bacterial co-infection was **8.6%**.

Bacterial and fungal coinfection among hospitalized patients with COVID-19: a retrospective cohort study in a UK secondary-care setting

S. Hughes^{1,*}, O. Troise¹, H. Donaldson^{1,2,3}, N. Mughal^{1,2,3}, L.S.P. Moore^{1,2,3}

A total of 836 patients with confirmed SARS-CoV-2 were included; 27 (3.2%) of 836 had early confirmed bacterial isolates identified (5 days after admission), rising to 51 (6.1%) of 836 throughout admission.

We found a low frequency of bacterial coinfection in early COVID-19 hospital presentation, and no evidence of concomitant fungal infection, at least in the early phase of COVID-19.

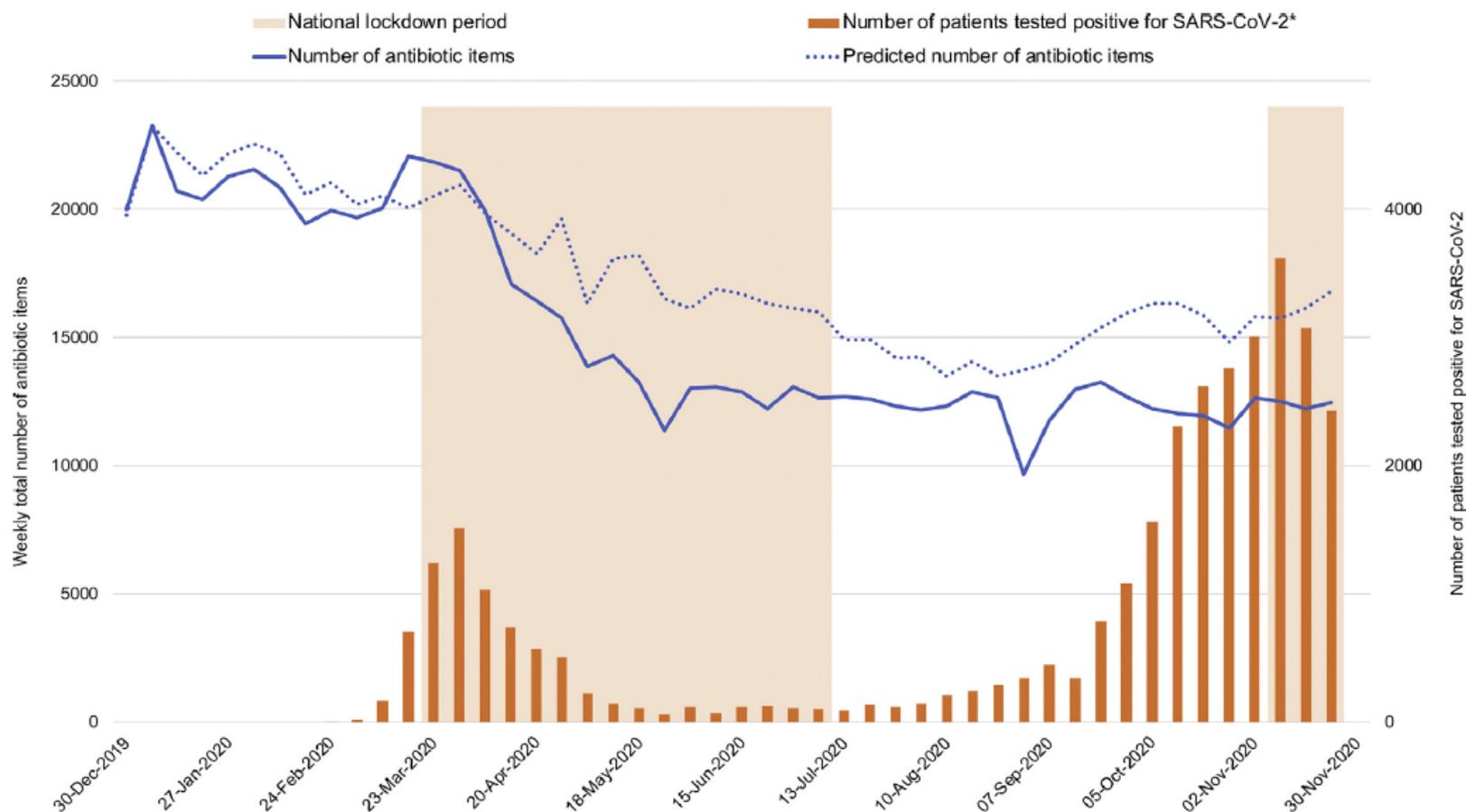
Table 2

Microbiologic culture results from SARS-CoV-2 cohort and comparator influenza A/B cohort, London, 2020

Characteristic	SARS-CoV-2 (n = 836)	Influenza A/B (n = 216)
Blood culture results, respiratory source		
<i>Enterobacteriales</i> (CA/HCAI)	1/1	—
<i>Streptococcus</i> spp. ^a	—	1
<i>Staphylococcus aureus</i> (CA/HCAI)	—	1/0
Blood culture results, nonrespiratory source		
Coagulase-negative staphylococci	36	6
<i>Enterobacteriales</i> (CA/HCAI)	5/1	—
<i>Streptococcus</i> spp. ^a	4/0	—
<i>Staphylococcus aureus</i> (CA/HCAI)	1/0	—
<i>Enterococcus</i> spp. (CA/HCAI)	1/3	—
<i>Candida albicans</i> (CA/HCAI)	0/3	—
<i>Pseudomonas aeruginosa</i>	0/1	—
Other	5 ^b	—
Blood cultures, no growth	583	133
Respiratory culture results		
No growth	64	22
<i>S. aureus</i> (CA/HCAI)	4/2	—
<i>Pseudomonas</i> spp. (CA/HCAI)	3/9	0/4
<i>Enterobacter</i> spp. (CA/HCAI)	2/3	—
<i>Klebsiella</i> spp. (CA/HCAI)	2/4	—
<i>Serratia</i> spp. (CA/HCAI)	1/1	1/0
<i>Candida</i> spp./yeast (CA/HCAI)	10/14	0/7
<i>Aspergillus</i> spp. (CA/HCAI)	1/2	0/1
Other pathogens		
CA (n)	<i>Haemophilus influenzae</i> (1)	<i>Moraxella</i> spp. (1), <i>Streptococcus pneumoniae</i> (2)
HCAI (n)	<i>Hafnia</i> spp. (1), <i>Morganella</i> spp. (1), <i>Providencia</i> spp. (1), <i>Stenotrophomonas maltophilia</i> (2)	—
Pneumococcal antigen (detected/tested)	0/249	1/19
<i>Legionella</i> antigen (detected/tested)	0/246	0/21
Influenza A/B, RSV (detected/tested)	0/250	—

Investigating the impact of COVID-19 on primary care antibiotic prescribing in North West London across two epidemic waves

Nina Zhu ¹, Paul Aylin ^{1,2}, Timothy Rawson ^{1,3,4,5}, Mark Gilchrist ^{1,3,4,5}, Azeem Majeed ², Alison Holmes ^{1,3,4,5,*}



*The number of patients tested positive for SARS-CoV-2 in the study population in North West London decreased during the last two weeks in November. This does not represent the decline of the second wave or the end of the pandemic in the UK.

Fig. 1. Weekly GP antibiotic prescriptions and positive SARS-CoV-2 cases, January 2020 – November 2020, north west London.

Investigating the impact of COVID-19 on primary care antibiotic prescribing in North West London across two epidemic waves

Nina Zhu ¹, Paul Aylin ^{1,2}, Timothy Rawson ^{1,3,4,5}, Mark Gilchrist ^{1,3,4,5}, Azeem Majeed ², Alison Holmes ^{1,3,4,5,*}

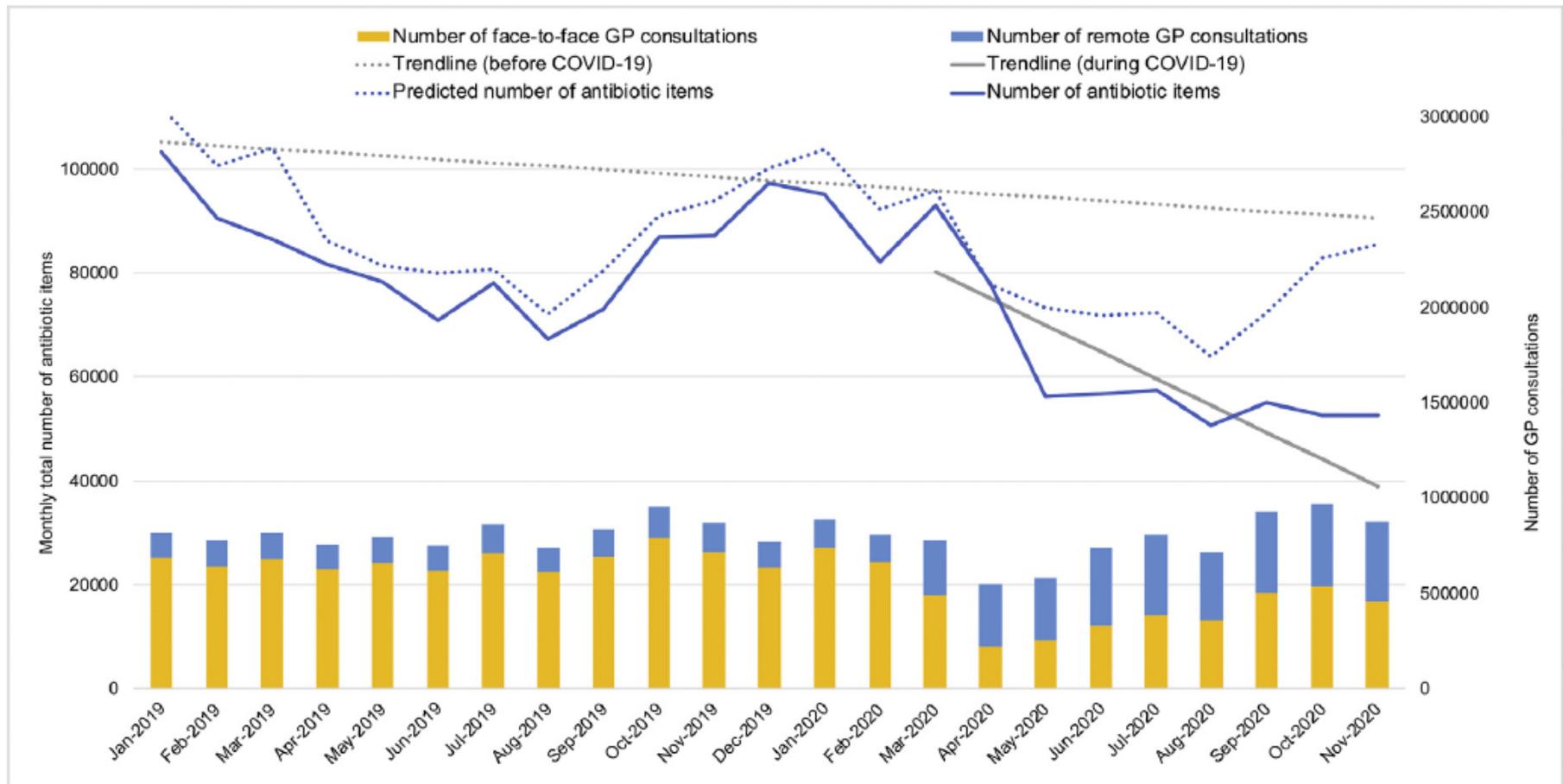
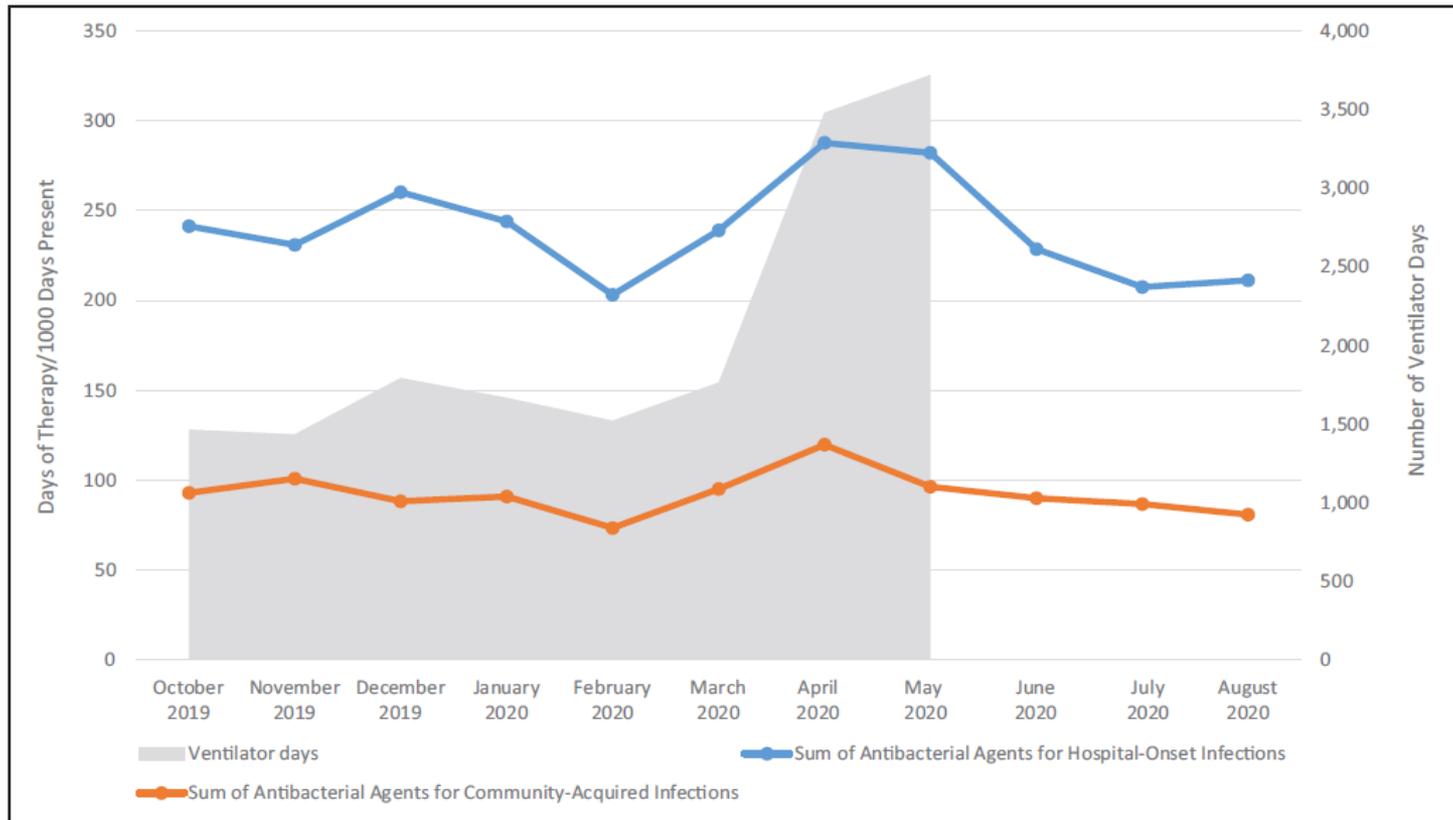


Fig. 2. Monthly GP antibiotic prescriptions and consultations with historical trend, January 2019 – November 2020, north west London.

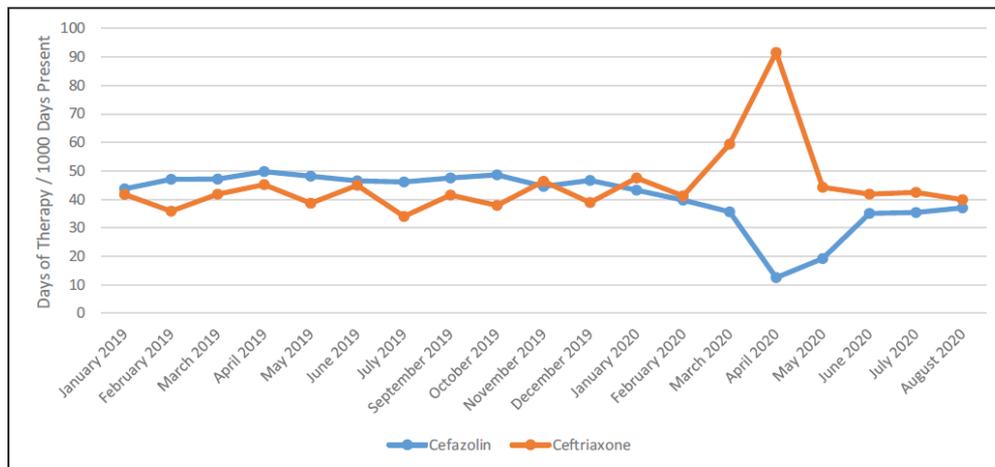
Antimicrobial stewardship perspectives from a New York City hospital during the COVID-19 pandemic: Challenges and opportunities



With the lack of effective antivirals, antibiotic use in critically ill patients was difficult to avoid. Uncertainty drove antimicrobial use and thus antimicrobial stewardship principles were paramount. The dramatic influx of patients, drug and equipment shortages, and the need for prescribers to practice in alternative roles only compounded the situation

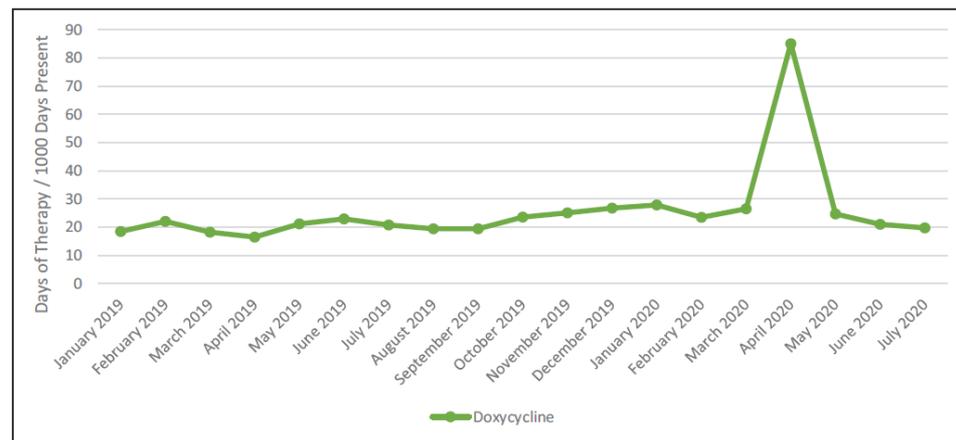
Antimicrobial stewardship perspectives from a New York City hospital during the COVID-19 pandemic: Challenges and opportunities

Figure 2. Trends in cefazolin and ceftriaxone days of therapy at NewYork-Presbyterian Hospital.



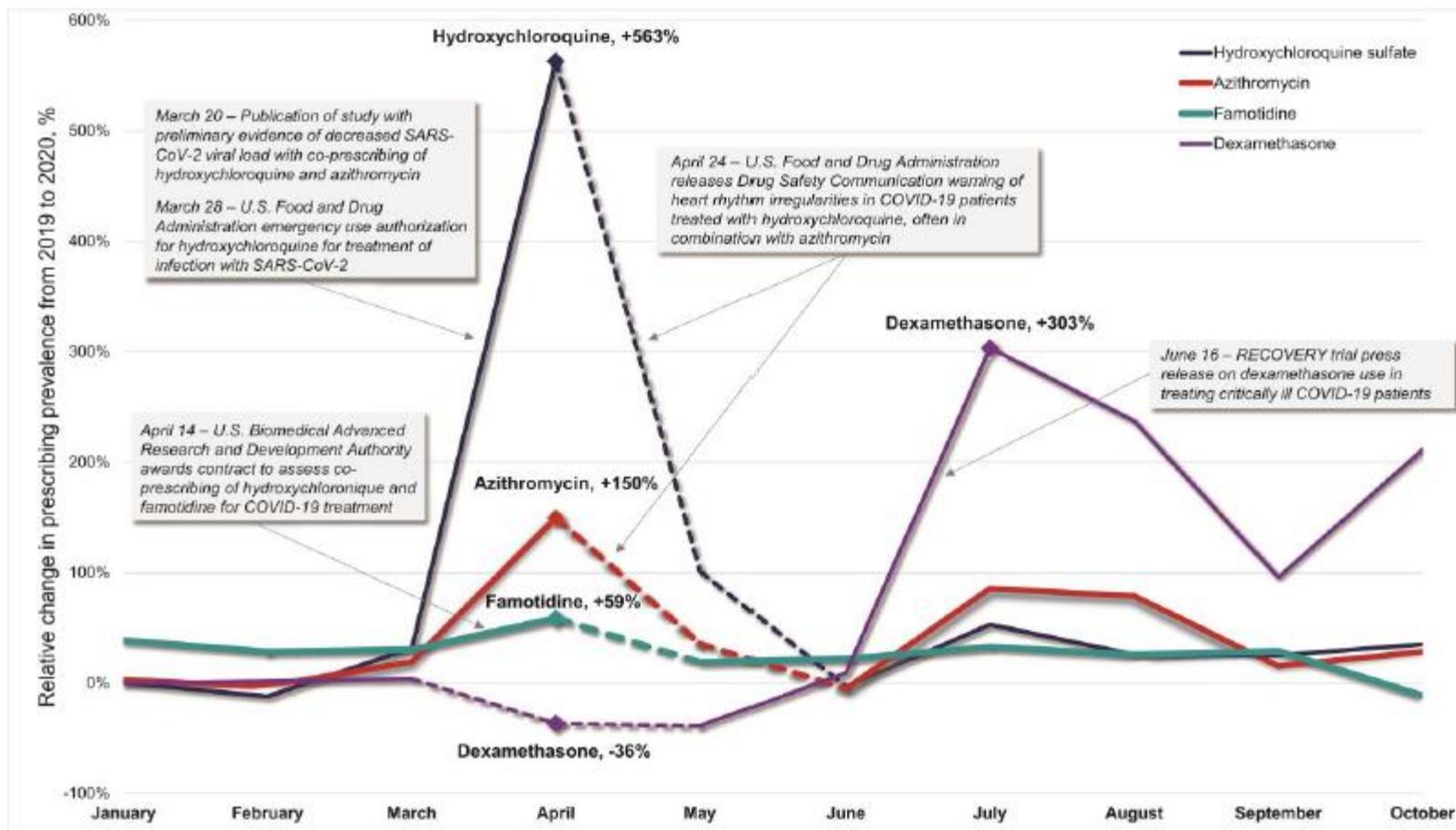
Establishing enhanced communication, education, and inventory control while leveraging the capabilities of the electronic medical record were some of the tools used to optimize existing resources.

Figure 3. Trend in doxycycline days of therapy at NewYork-Presbyterian Hospital.



Trends in Prescribing of Antibiotics and Drugs Investigated for COVID-19 Treatment in U.S.

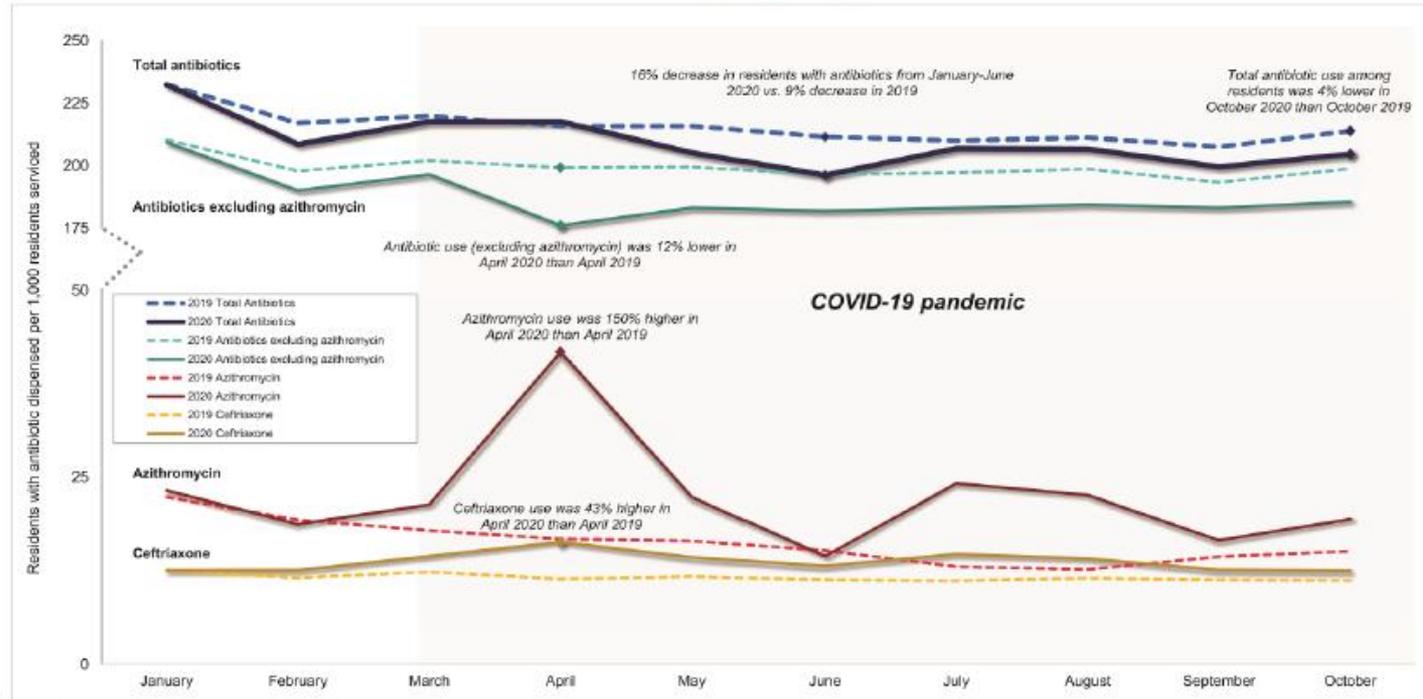
Nursing Home Residents During the COVID-19 Pandemic



Trends in Prescribing of Antibiotics and Drugs Investigated for COVID-19 Treatment in U.S.

Nursing Home Residents During the COVID-19 Pandemic

Figure 2



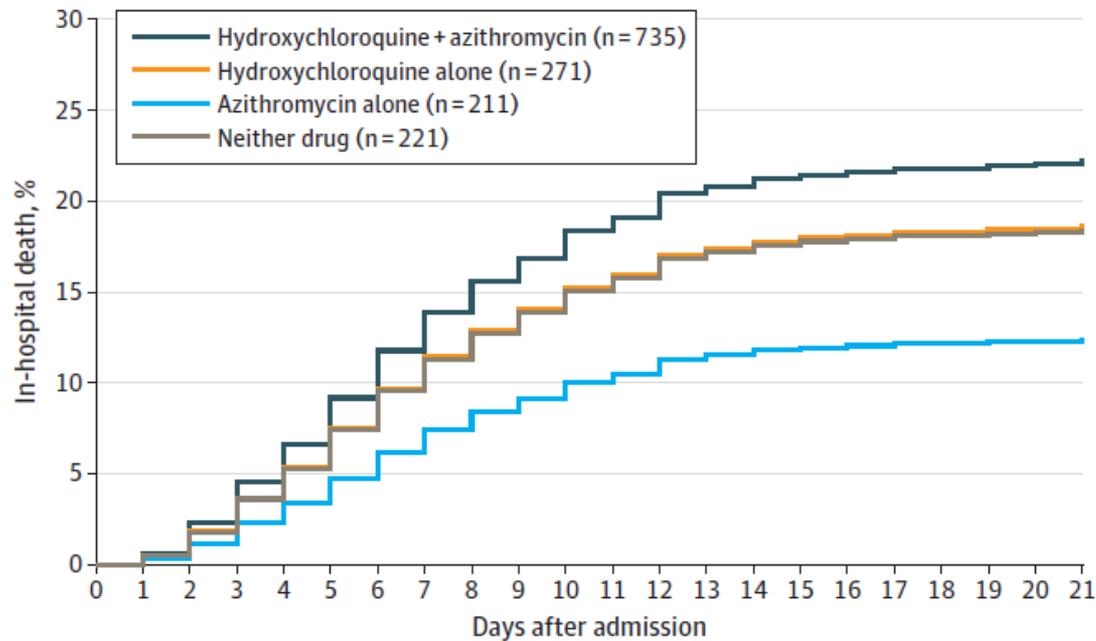
During the pandemic, large numbers of residents were prescribed drugs investigated for COVID-19 treatment, and an **increase in prescribing of antibiotics commonly used for respiratory infections** was observed.

Prescribing of these drugs may increase the risk of adverse events, without providing clear benefits.

Association of Treatment With Hydroxychloroquine or Azithromycin With In-Hospital Mortality in Patients With COVID-19 in New York State

Eli S. Rosenberg, PhD; Elizabeth M. Dufort, MD; Tomoko Udo, PhD; Larissa A. Wilberschied, MS;
 Jessica Kumar, DO; James Tesoriero, PhD; Patti Weinberg, PA; James Kirkwood, MPH; Alison Muse, MPH;
 Jack DeHovitz, MD; Debra S. Blog, MD; Brad Hutton, MPH; David R. Holtgrave, PhD; Howard A. Zucker, MD

Figure 2. Model-Adjusted Estimated In-Hospital Mortality, by Treatment Group



No. at risk (in hospital)

	Admission	Day 7	Day 14	Day 21
Hydroxychloroquine + azithromycin	735	653 (384)	568 (106)	557 (47)
Hydroxychloroquine alone	271	245 (136)	226 (59)	220 (28)
Azithromycin alone	211	191 (33)	190 (4)	190 (2)
Neither drug	221	206 (63)	197 (19)	195 (13)

Compared with the neither-drug group, none of the 3 treatment groups had statistically different rates of death

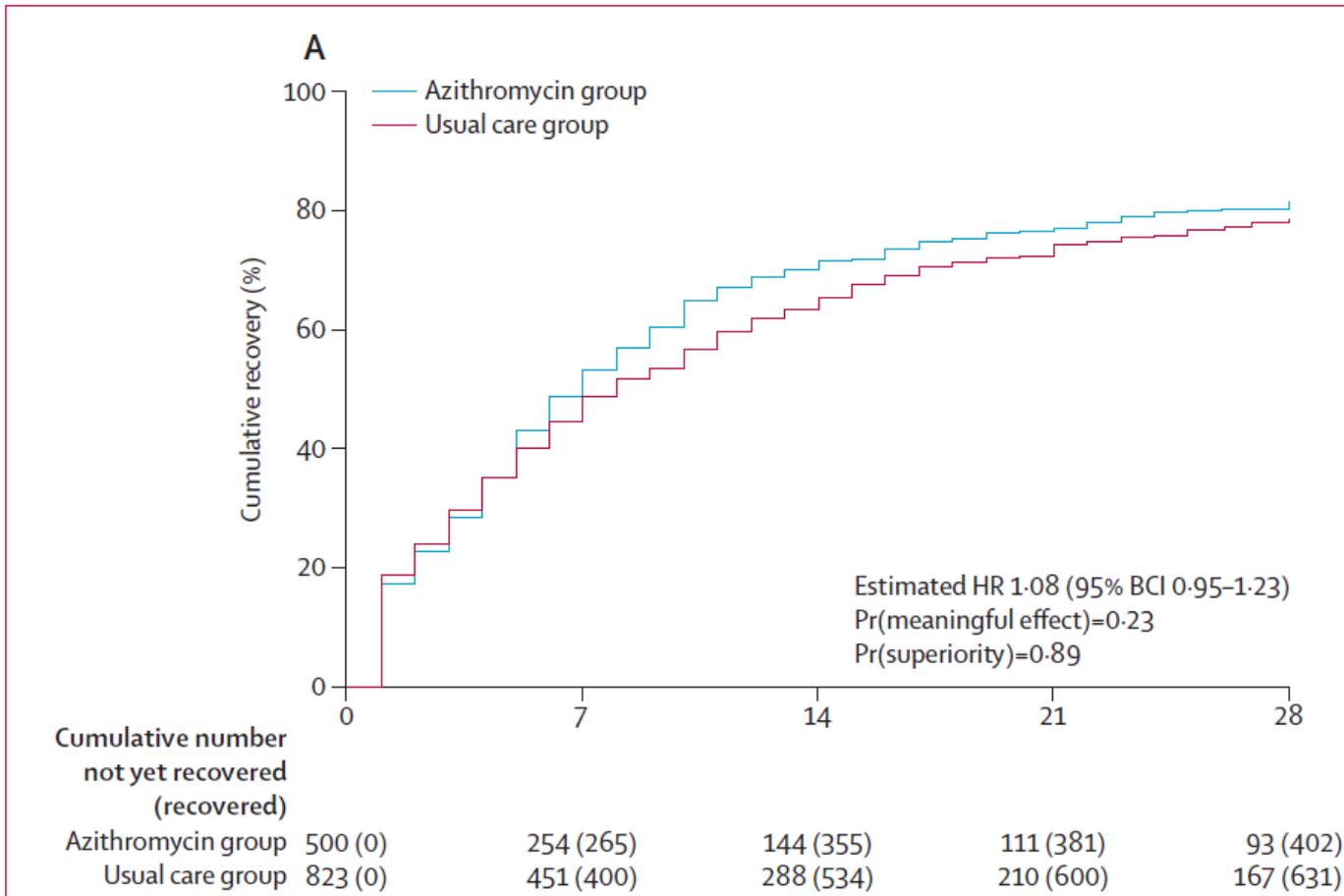
Azithromycin for community treatment of suspected COVID-19 in people at increased risk of an adverse clinical course in the UK (PRINCIPLE): a randomised, controlled, open-label, adaptive platform trial



PRINCIPLE Trial Collaborative Group*



Lancet 2021; 397: 1063-74





Read about [our approach to COVID-19](#)

Home > NICE Guidance > Conditions and diseases > Infections > COVID-19

We are reviewing these guidelines as new evidence, policy and practice emerges: [give us your feedback](#).

COVID-19 rapid guideline: managing COVID-19

NICE guideline [NG191] Published: 23 March 2021 Last updated: 03 June 2021

7 Therapeutics for COVID-19

7.1 Antibiotics

Info box

Antibiotics should not be used for preventing or treating COVID-19 unless there is clinical suspicion of additional bacterial co-infection. See the [section on suspected or confirmed co-infection](#).

See also the [recommendation on azithromycin](#) in the section on therapeutics for COVID-19.

7.2 Azithromycin

Strong recommendation against

Do not use azithromycin to treat COVID-19.

Antimicrobial Resistance Threats in the emerging COVID-19 pandemic: Where do we stand?

Soumya Ghosh^a, Charné Bornman^a, Mai M. Zafer^{b,*}

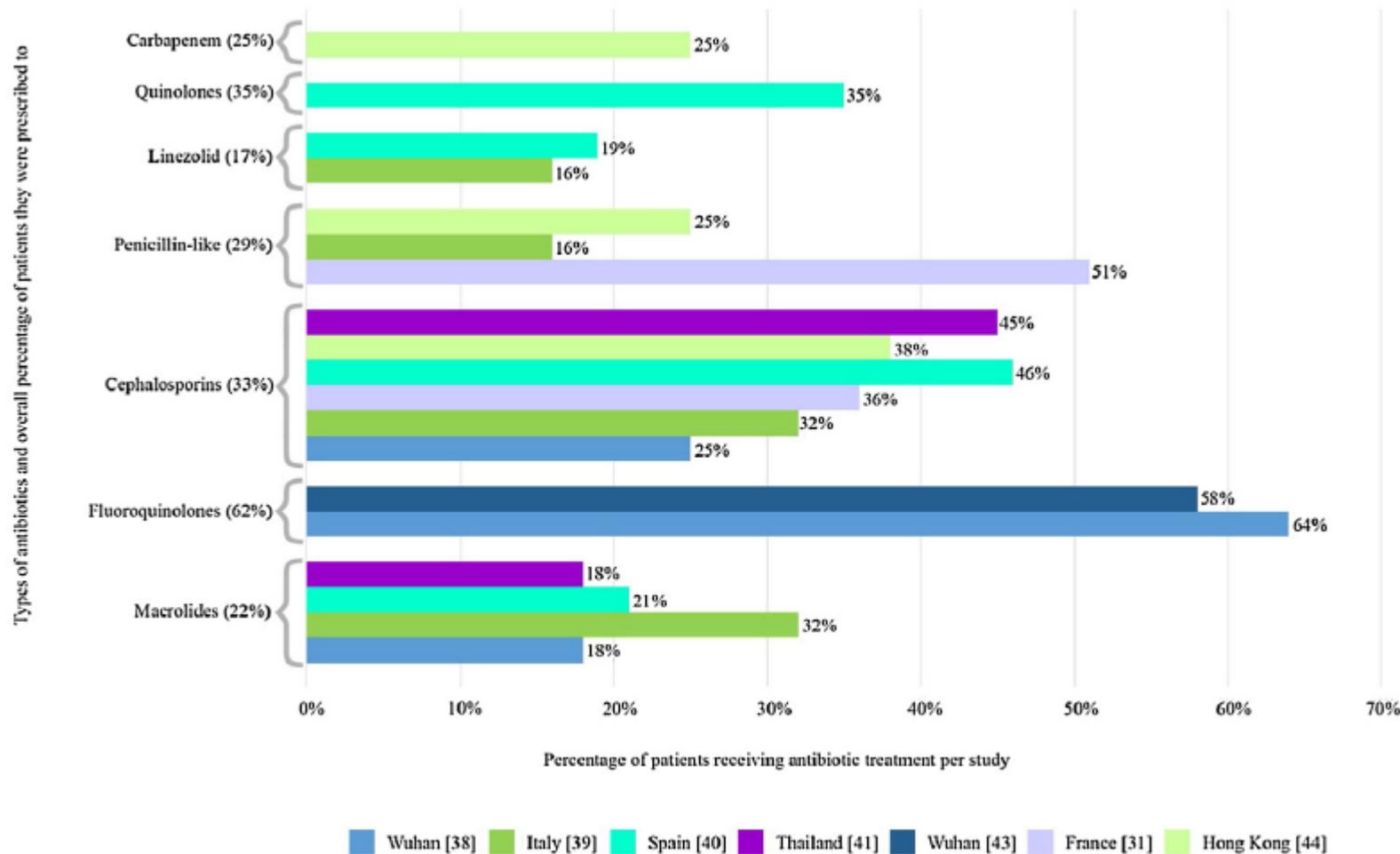


fig. 1. Percentage (per study) of patients receiving specific antibiotics and total percentage of patients they were prescribed to.

RESEARCH

Open Access



Effects of coronavirus disease 2019 (COVID-19) pandemic on antimicrobial prevalence and prescribing in a tertiary hospital in Singapore

Tat Ming Ng^{1*}, Sock Hoon Tan¹, Shi Thong Heng¹, Hui Lin Tay¹, Min Yi Yap¹, Boon Hou Chua¹, Christine B. Teng^{1,2}, David C. Lye^{3,4,5,6} and Tau Hong Lee^{3,4,5,6}

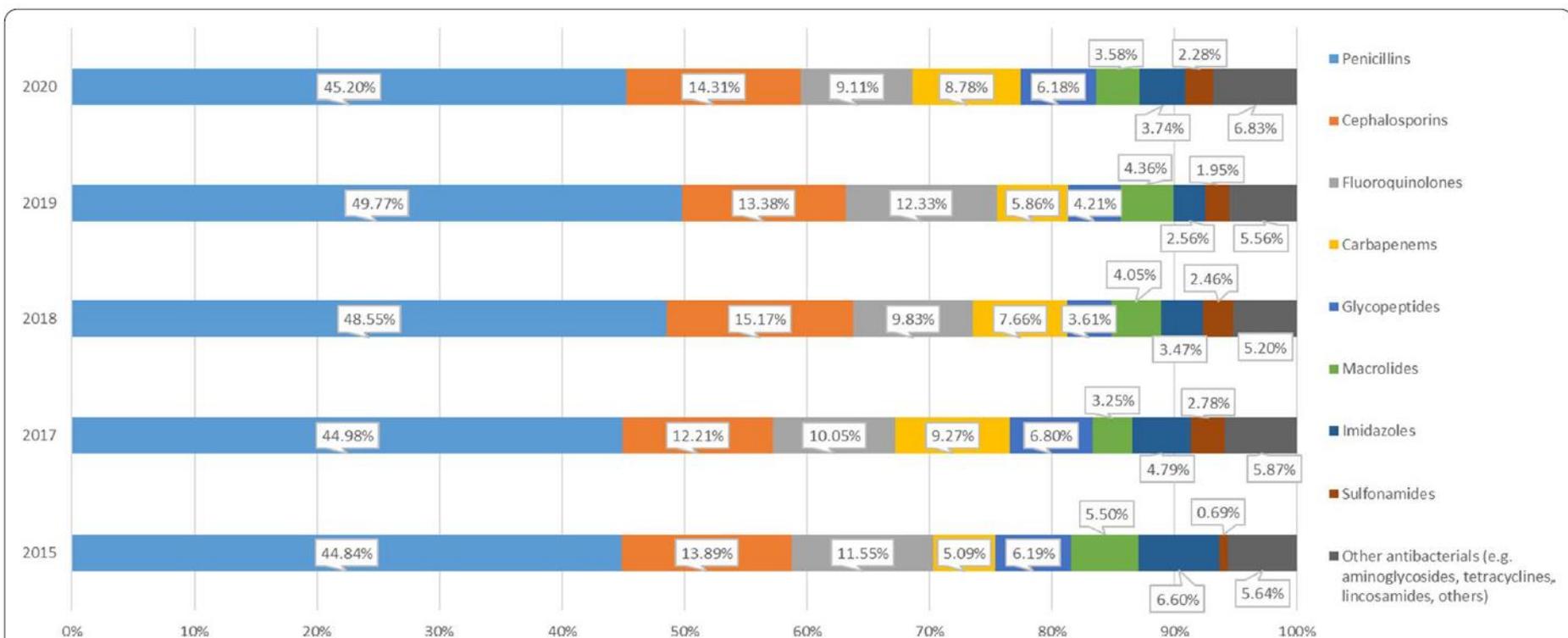


Fig. 2 Anti-bacterial use from 2015 to 2020

During the COVID-19 pandemic, there was no increase in antimicrobial prescribing and no significant differences in antimicrobial prescribing quality indicators.

Bacterial and fungal co-infection in individuals with coronavirus: A rapid review to support COVID-19 antimicrobial prescribing

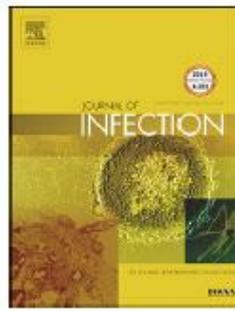


Timothy M Rawson^{1,2,3}, Luke SP Moore^{1,4,5}, Nina Zhu,¹ Nishanthy Ranganathan^{3,4}, Keira Skolimowska^{3,4}, Mark Gilchrist^{3,4}, Giovanni Satta^{3,4}, Graham Cooke^{3,4}, Alison Holmes^{1,2,3,4}

- For COVID-19, 62/806 (8%) patients were reported as experiencing bacterial/fungal co-infection during hospital admission.
- Secondary analysis demonstrated wide use of broad-spectrum antibacterials, despite a paucity of evidence for bacterial coinfection.
- No antimicrobial stewardship interventions were described.

Survey of antibiotic and antifungal prescribing in patients with suspected and confirmed COVID-19 in Scottish hospitals

Ronald A. Seaton^{a,b,*}, Cheryl L. Gibbons^c, Lesley Cooper^b, William Malcolm^c, Rachel McKinney^d, Stephanie Dundas^e, David Griffith^f, Danielle Jeffreys^g, Kayleigh Hamilton^h, Brian Choo-Kangⁱ, Suzanne Brittain^j, Debbie Guthrie^k, Jacqueline Sneddon^b



820 patients were included, 64.8% were SARS-CoV-2 positive and 14.9% were managed in critical care, and **22.1% of SARS-CoV-2 infections were considered probable or definite nosocomial infections.**

On the **survey day**, antibiotic prevalence was 45.0% and 73.9% were prescribed for suspected respiratory tract infection.

Amoxicillin, doxycycline and co-amoxiclav accounted for over half of all antibiotics in non-critical care wards and meropenem, piperacillin-tazobactam and co-amoxiclav accounted for approximately half prescribed in critical care.

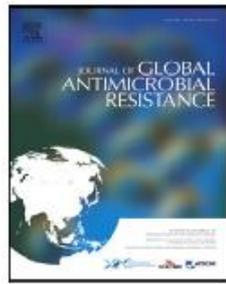
Of all SARS-CoV-2 patients, 38.3% were prescribed antibiotics.

In a multivariable logistic regression analysis, COPD/chronic lung disease and CRP ≥ 100 mg/l were associated with higher odds and probable or confirmed nosocomial COVID-19, diabetes and management on an elderly care ward had lower odds of an antibiotic prescription.

Systemic antifungals were prescribed in 9.8% of critical care patients and commenced a median of 18 days after critical care admission.

A point prevalence survey to assess antibiotic prescribing in patients hospitalized with confirmed and suspected coronavirus disease 2019 (COVID-19)

Sock Hoon Tan^a, Tat Ming Ng^{a,*}, Hui Lin Tay^a, Min Yi Yap^a, Shi Thong Heng^a,
Audrey Yong Xin Loo^a, Christine B. Teng^{a,b}, Tau Hong Lee^{c,d,e,f}



- Point prevalence survey was conducted in COVID-19 wards on 22 April 2020 at 0800h.
- Patients on systemic antibiotics were included and evaluated for antibiotic appropriateness.
- Thirty-one out of 51 (60.8%) antibiotic prescriptions were appropriate
- Despite low prevalence of antibiotic use among confirmed and suspected COVID-19, there was **significant proportion of inappropriate antibiotics use where bacterial infections were unlikely.**



COVID-19 and the potential long-term impact on antimicrobial resistance

Timothy M. Rawson ¹⁻³, Luke S. P. Moore^{1,3,4}, Enrique Castro-Sanchez ¹, Esmita Charani ^{1,5},
Frances Davies^{1,3}, Giovanni Satta^{1,3}, Matthew J. Ellington⁵ and Alison H. Holmes^{1-3*}

- Whilst the pandemic has focused society on the threat of emerging infections and hand hygiene, certain infection control and antimicrobial stewardship policies may have to be relaxed.
- Whilst the urgent focus must be on controlling this pandemic, sustained efforts to address the longer-term global threat of antimicrobial resistance should not be overlooked.

RAPID DIAGNOSTICS WOULD REDUCE UNNECESSARY PRESCRIPTION

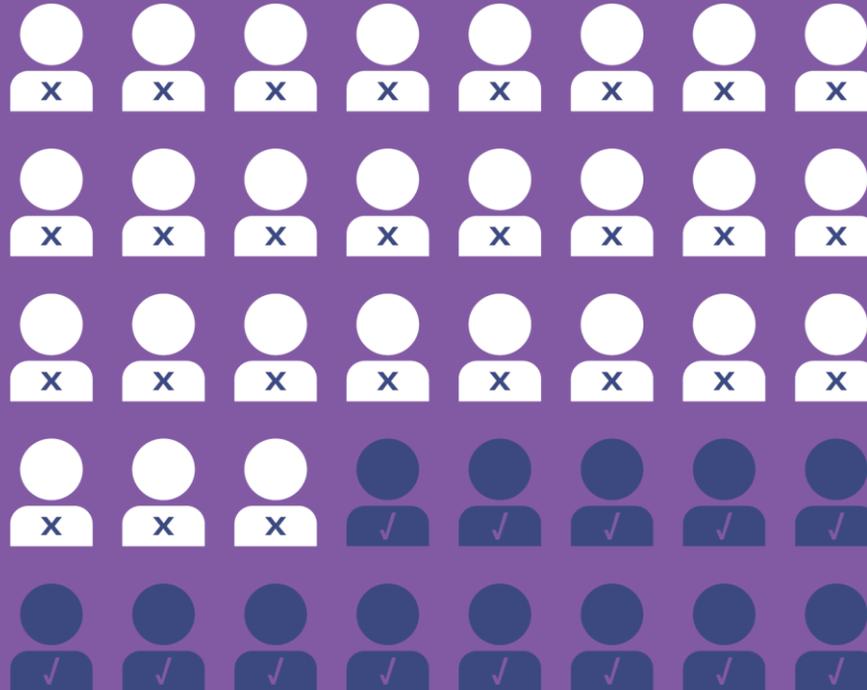
Out of 40m people who are given antibiotics for respiratory issues, annually in the U.K.

27m

get antibiotics unnecessarily

13m

who need antibiotics get them



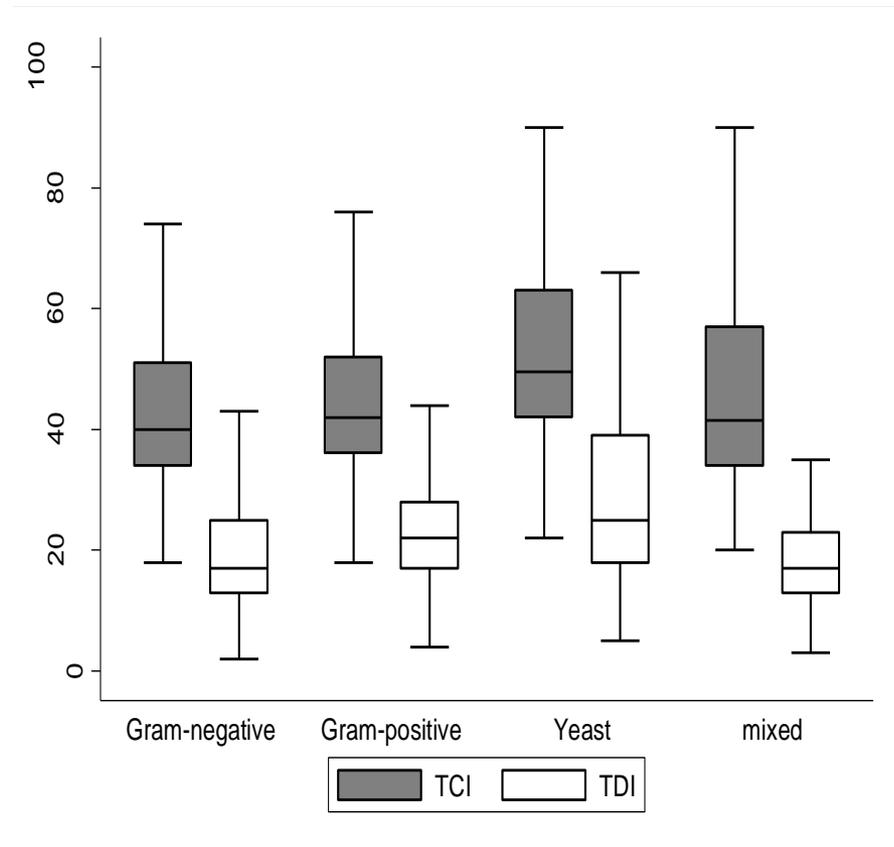
Optimized Use of the MALDI BioTyper System and the FilmArray BCID Panel for Direct Identification of Microbial Pathogens from Positive Blood Cultures

B. Fiori,^a T. D'Inzeo,^a A. Giaquinto,^a G. Menchinelli,^a F. M. Liotti,^a F. de Maio,^a G. De Angelis,^a G. Quaranta,^a D. Nagel,^a M. Tumbarello,^b B. Posteraro,^c M. Sanguinetti,^a T. Spanu^a

Institute of Microbiology,^a Institute of Infectious Diseases,^b and Institute of Public Health (Section of Hygiene),^c Università Cattolica del Sacro Cuore, Rome, Italy

Time to identification

- The median time to positivity was 12.2 hours (IQR: 8.2-17.5), ranging from 10.4 h (IQR: 7-15.1) for Gram-negative bacteria, to 15.2 h (IQR: 10.3-18.5) for Gram-positive isolates. It was 16.4 h (IQR: 10.3-28) for yeasts and 10.5 h (IQR: 6-16) for polymicrobial cultures.
- The median time to identification for the direct method was 19.5 hours (IQRs: 14.3-26.5 h) (range: 17.2 h for Gram-negatives to 21.5 h for gram-positives and yeasts) and that for the comparison culture-based method was 41.7 h (IQRs, 35.5-53 h)



TCI, time to culture-based identification results ; TDI, time to direct identification results.



Impact of rapid multiplex PCR on management of antibiotic therapy in COVID-19-positive patients hospitalized in intensive care unit

Naouale Maataoui^{1,2} • Lotfi Chemali² • Juliette Patrier³ • Alexy Tran Dinh^{4,5} • Lucie Le Fèvre³ • Brice Lortat-Jacob⁴ • Mehdi Marzouk³ • Camille d'Humières^{1,2} • Emilie Rondinaud^{1,2} • Etienne Ruppé^{1,2} • Philippe Montravers^{4,5} • Jean-François Timsit^{1,3} • Laurence Armand-Lefèvre^{1,2}

- Because the diagnosis of co/superinfection in COVID-19 patients is challenging, empirical antibiotic therapy is frequently initiated until microbiological analysis results.
- We evaluated the performance and the impact of the BioFire® FilmArray® Pneumonia plus Panel on 112 respiratory samples from 67 COVID-19 ICU patients suspected of co/superinfections.
- Globally, the sensitivity and specificity of the test were 89.3% and 99.1%, respectively.
- Positive tests led to antibiotic initiation or adaptation in 15% of episodes and de-escalation in 4%.
- When negative, 28% of episodes remained antibiotic-free (14% no initiation, 14% withdrawal).
- Rapid multiplex PCRs can help to improve antibiotic stewardship by administering appropriate antibiotics earlier and avoiding unnecessary prescriptions.

automated multiplex PCR test allowing direct detection of 15 bacteria, 3 atypical bacteria, 9 viruses, and 7 antimicrobial resistance genes within 1 h and 15 min

RESEARCH LETTER

Open Access



Co-infections in COVID-19 critically ill and antibiotic management: a prospective cohort analysis

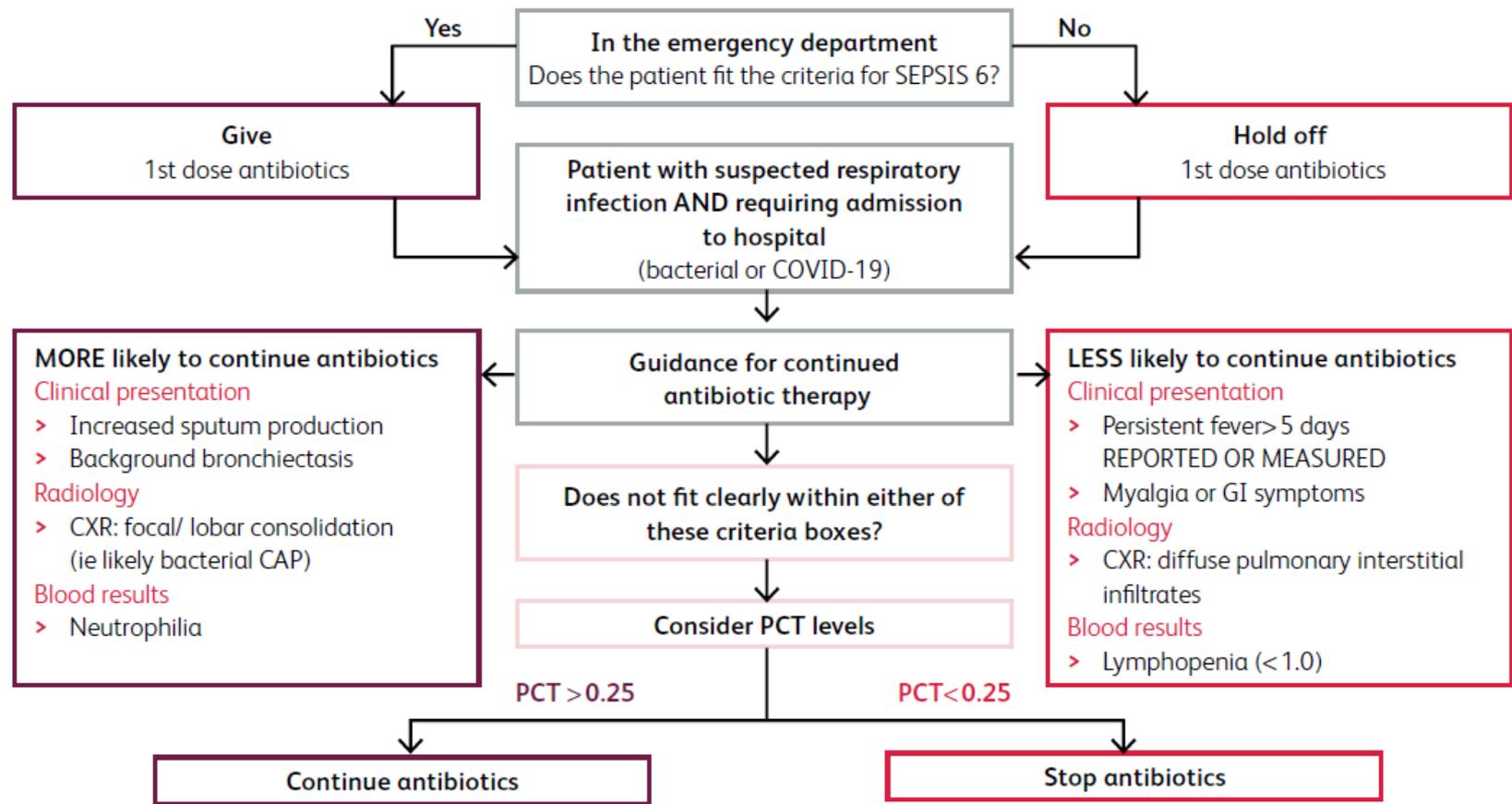
Alexia Verroken^{1*} , Anaïs Scohy¹, Ludovic Gérard², Xavier Wittebole², Christine Collienne² and Pierre-François Laterre²

- FA-PNEU was performed within a mean of 10 days following symptoms' onset and a **mean of 1 day following ICU admission**.
- FA-PNEU results identified 13/32 (**40.6%**) patients with a bacterial co-infection.
- *Staphylococcus aureus*, *Haemophilus influenzae*, and *Moraxella catarrhalis* were the principal bacteria identified with significant genome copies.
- None of the 32 FA-PNEU tests identified atypical bacteria neither other respiratory viruses.
- Direct communication of FA-PNEU results led to speeded-up antibiotic modifications in 15/32 (**46.9%**) patients.

Use of procalcitonin for antibiotic stewardship in patients with COVID-19: A quality improvement project in a district general hospital

Authors: Christina Peters,^A Kelly Williams,^A Elena A Un,^A Louisa Little,^B Abeer Saad,^C Katherine Lendrum,^D Naomi Thompson,^E Nicholas D Weatherley^F and Amanda Pegden^G

Procalcitonin <0.1 µg/L	Antibiotics strongly discouraged
Procalcitonin 0.1–0.24 µg/L	Antibiotics discouraged
Procalcitonin 0.25–0.49 µg/L	Antibiotics encouraged
Procalcitonin ≥0.5 µg/L	Antibiotics strongly encouraged



Procalcitonin testing, when used in combination with thorough clinical assessment, is a safe, simple and sustainable way of reducing antibiotic use in COVID-19.

DE-ESCALATION THERAPY



Stage 1

- Administering the broadest-spectrum antibiotic therapy to improve outcomes (decrease mortality, prevent organ dysfunction, and decrease length of stay)

Stage 2

- Focusing on de-escalating as a means to minimize resistance and improve cost-effectiveness

Antimicrobial Stewardship

Goals

- Improve patient outcomes
- Optimize selection, dose and duration of Rx
- Reduce adverse drug events including secondary infection (e.g. *C. difficile* infection)
- Reduce morbidity and mortality
- Limit emergence of antimicrobial resistance
- Reduce length of stay
- Reduce health care expenditures

Disclaimer: Early release articles are not considered as final versions. Any changes will be reflected in the online version in the month the article is officially released.

Volume 26, Number 9—September 2020

Research Letter

Clostridioides difficile in COVID-19 Patients, Detroit, Michigan, USA, March–April 2020

Avnish Sandhu, Glenn Tillotson, Jordan Polistico, Hossein Salimnia, Mara Cranis, Judy Moshos, Lori Cullen, Lavina Jabbo, Lawrence Diebel, and Teena Chopra✉

Author affiliations: Detroit Medical Center, Detroit, Michigan, USA (A. Sandhu, J. Polistico, H. Salimnia, M. Cranis, J. Moshos, L. Cullen, L. Jabbo, T. Chopra); Wayne State University School of Medicine, Detroit (A. Sandhu, J. Polistico, H. Salimnia, L. Diebel, T. Chopra); GST Micro LLC, Henrico, Virginia, USA (G. Tillotson)

[Suggested citation for this article](#)

Abstract

We describe 9 patients at a medical center in Detroit, Michigan, USA, with severe acute respiratory syndrome coronavirus 2 and *Clostridioides difficile*. Both infections can manifest as digestive symptoms and merit screening when assessing patients with diarrhea during the coronavirus disease pandemic. These co-infections also highlight the continued importance of antimicrobial stewardship.

Coronavirus disease (COVID-19), which is caused by infection with severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), predominantly includes pulmonary symptoms; however, <10% of cases also include gastrointestinal events, including abdominal pain, diarrhea, and vomiting ([1–4](#)). During the COVID-19 pandemic, clinicians must be vigilant of co-infections in patients with COVID-19.

Several studies have collected data on concomitant antibiotic use in patients with COVID-19. A single-center study of 52 critically ill patients cited hospital-acquired infection in only 7 (13.5%) patients, yet 49 (94%) patients received antibiotic therapy ([5](#)). Another study, which analyzed 113 deceased patients from a cohort of 799 moderate-to-severely ill COVID-19 patients during January 13–February 12, 2020, reported that 105 (93%) deceased patients and 144 (89%) survivors had received empiric antibacterial therapy with either moxifloxacin, cefoperazone, or azithromycin ([6](#)). These antibiotics are strongly associated with *C. difficile* infection (CDI) ([7](#)). We report an observation of CDI as a co-occurrence or sequelae of overuse of antibiotics in COVID-19 patients.

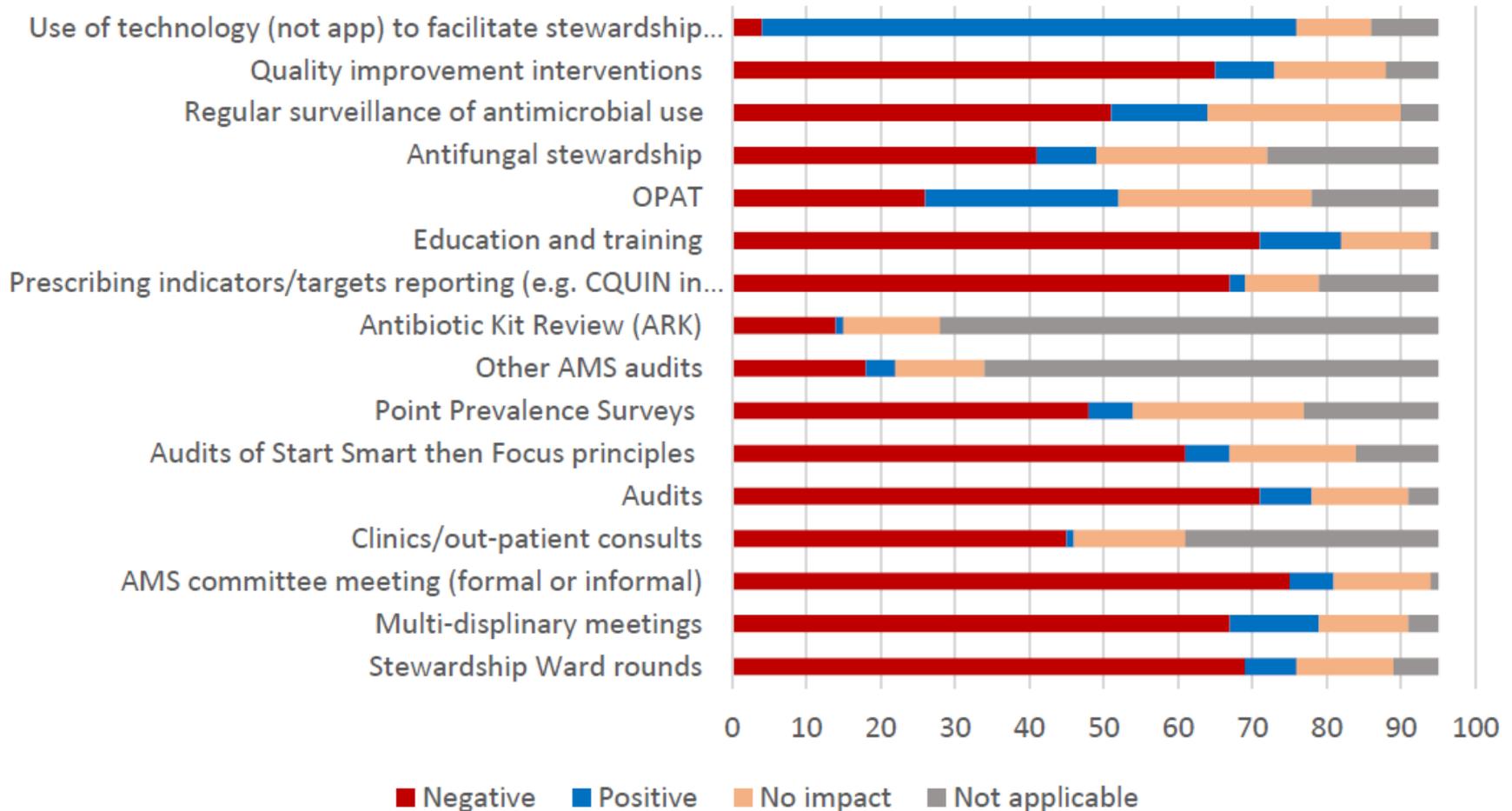
Article

Assessing the Impact of COVID-19 on Antimicrobial Stewardship Activities/Programs in the United Kingdom

Diane Ashiru-Oredope ^{1,*}, Frances Kerr ², Stephen Hughes ¹, Jonathan Urch ¹, Marisa Lanzman ¹, Ting Yau ¹, Alison Cockburn ², Rakhee Patel ¹, Adel Sheikh ¹, Cairine Gormley ³, Aneeka Chavda ¹, Tejal Vaghela ¹, Ceri Phillips ⁴, Nicholas Reid ⁴ and Aaron Brady ³

A questionnaire was disseminated to AMS leads in the UK

Impact of COVID-19 on AMS activities



Article

Assessing the Impact of COVID-19 on Antimicrobial Stewardship Activities/Programs in the United Kingdom

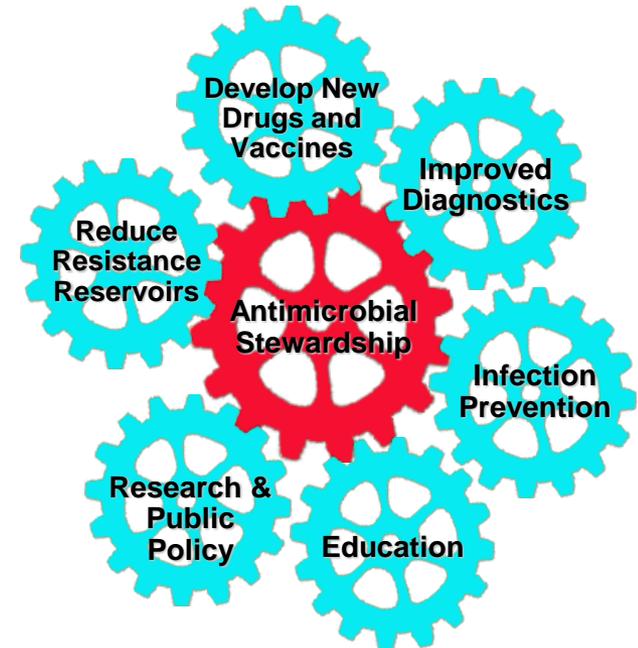
Diane Ashiru-Oredope ^{1,*}, Frances Kerr ², Stephen Hughes ¹, Jonathan Urch ¹, Marisa Lanzman ¹, Ting Yau ¹, Alison Cockburn ², Rakhee Patel ¹, Adel Sheikh ¹, Cairine Gormley ³, Aneeka Chavda ¹, Tejal Vaghela ¹, Ceri Phillips ⁴, Nicholas Reid ⁴ and Aaron Brady ³

- Most respondents reported a reduction in AMS activity with **64%** (61/95) reporting that COVID-19 had a negative impact on routine AMS activities.
- **Activities reported to have been negatively affected by the pandemic include audit, quality improvement initiatives, education, AMS meetings, and multidisciplinary working including ward rounds.**
- However, positive outcomes were also identified, with technology being increasingly used as a tool to facilitate stewardship, e.g., virtual meetings and ward rounds and increased the acceptance of using procalcitonin tests to distinguish between viral and bacterial infections

Who is involved in an AS Program?

- Antimicrobial Stewardship Team - **multidisciplinary**
- ID physician
- Clinical microbiologist
- ID pharmacist
- IT support
- IC/epidemiology support

- Antimicrobial Stewardship Committee
- Members of the AS team
- Director for Infection Prevention & Control for organisation
- Other clinical members
 - Intensivists, physicians, surgeons, paediatricians



HOW SURVEILLANCE CAN IMPROVE HEALTH OUTCOMES

Globally

Provide early warnings of emerging threats and data to identify and act on long-term trends

Nationally

Guide policy and ensure appropriate and timely public health interventions

Locally

Allow healthcare professionals to make better informed clinical decisions to ensure better patient outcomes

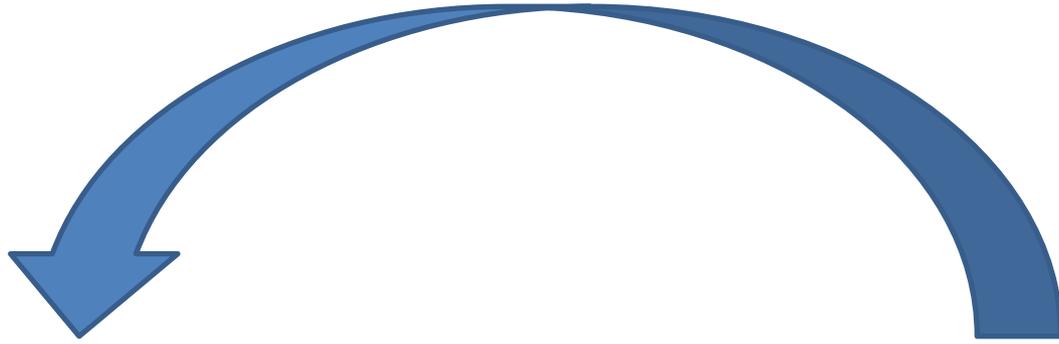
Antibiogramma cumulativo-Materiali Invasivi

Periodo 01/07/2019 - 30/09/2019

Percentuali di sensibilità

Batteri Gram Negativi	N° isolati	Ampicillina	Amoxicillina-clavulanico	Piperacillina/tazobactam	Cefotaxime	Ceftazidime	Cefepime	Ertapenem	Meropenem	Imipenem	Amikacina	Gentamicina	Ciprofloxacina	Cotrimoxazolo	Colistina	Tigeciclina
<i>Acinetobacter baumannii</i>	23	R						R	0%	0%	4%	0%	0%	0%	96%	
<i>Citrobacter freundii</i>	1	R	R	0%	0%	0%	0%	100%	100%	100%	100%	100%	0%	0%		
<i>Enterobacter aerogenes</i>	4	R	R	50%	50%	50%	100%	100%	100%	100%	100%	100%	100%	100%		
<i>Enterobacter cloacae</i>	14	R	R	93%	93%	93%	93%	100%	100%	100%	100%	100%	93%	93%		
<i>Escherichia coli</i>	134		44%	90%	71%	76%	82%	100%	100%	100%	100%	81%	60%	60%		
<i>Klebsiella pneumoniae</i>	84	R	63%	64%	70%	56%	60%	73%	73%	73%	86%	86%	60%	60%		
<i>Morganella morganii</i>	3	R	R	100%	100%	100%	100%	100%	100%	R	100%	100%	67%	100%	R	R
<i>Proteus mirabilis</i>	23		65%	100%	57%	61%	91%	100%	100%	R	96%	70%	48%	57%	R	R
<i>Pseudomonas aeruginosa</i>	41	R	R	83%			83%	90%	R	86%	86%	93%	95%	71%	R	
<i>Serratia marcescens</i>	13	R	R	100%	100%	100%	100%	100%	100%	100%	R	100%	100%	100%	R	
<i>Stenotrophomonas maltophilia</i>	4													100%		

>=90% Sensibili
 70-89 % Sensibili
 < 70% Sensibili
 Intrinsecamente resistenti



colonization

infection

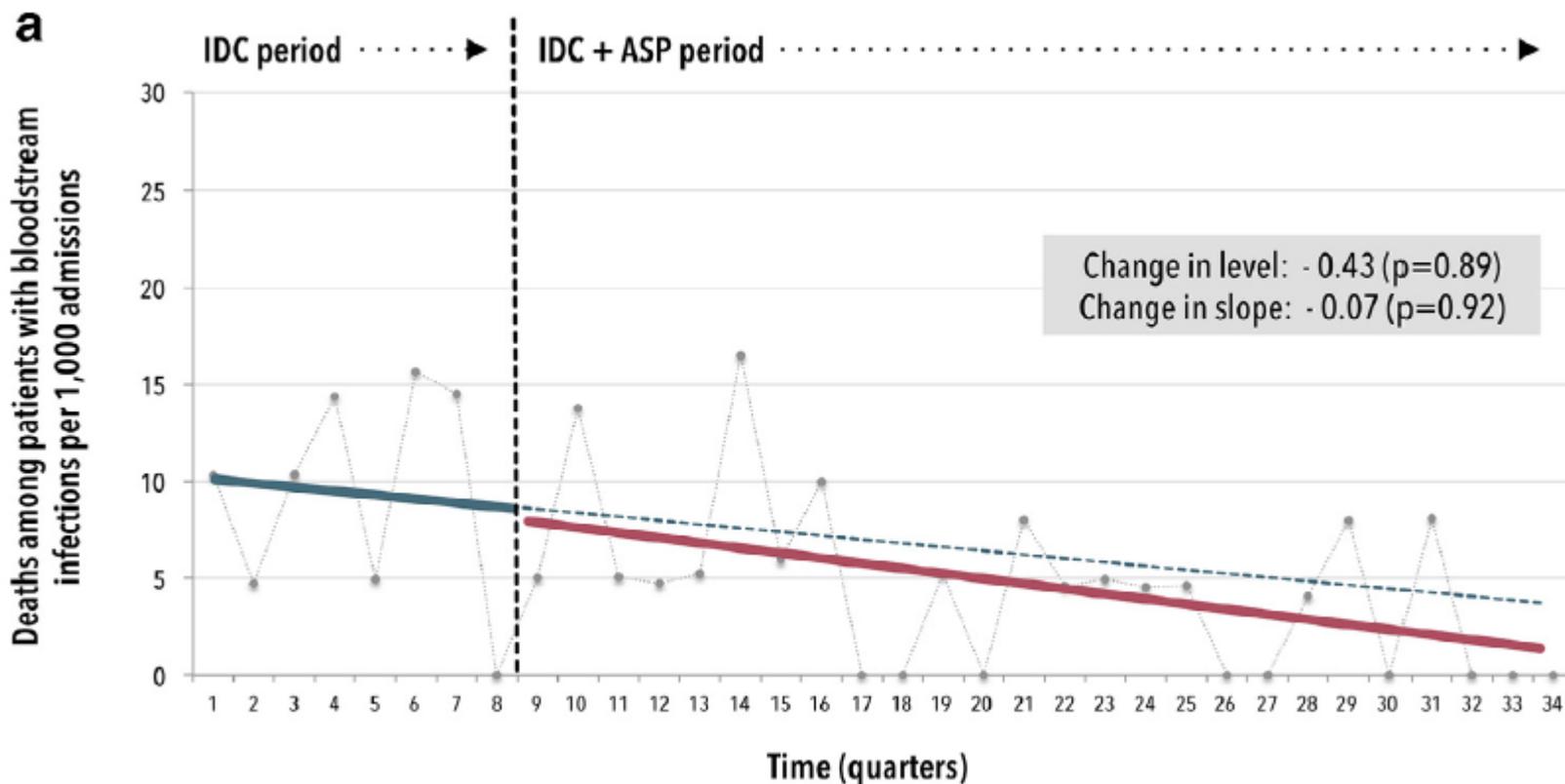


Why ID consultation?



Clinical impact of an educational antimicrobial stewardship program associated with infectious diseases consultation targeting patients with cancer: Results of a 9-year quasi-experimental study with an interrupted time-series analysis

José Molina^a, Manuel Noguer^b, José Antonio Lepe^a, María Antonia Pérez-Moreno^c, Manuela Aguilar-Guisado^a, Roberto Lasso de la Vega^b, Germán Peñalva^a, Juan Carlos Crespo-Rivas^a, María Victoria Gil-Navarro^c, Javier Salvador^b, José Miguel Cisneros^{a,*}



The combination of an ASP with IDC improved antibiotic use among patients with cancer, and was accompanied by a reduction of mortality of bacteraemic infections.

Impact of Infectious Disease Consultation on Quality of Care, Mortality, and Length of Stay in *Staphylococcus aureus* Bacteremia: Results From a Large Multicenter Cohort Study

Anthony D. Bai,¹ Adrienne Showler,² Lisa Burry,^{3,4} Marilyn Steinberg,³ Daniel R. Ricciuto,^{2,5} Tania Fernandes,⁶ Anna Chiu,⁶ Sumit Raybardhan,⁷ Michelle Science,⁸ Eshan Fernando,² George Tomlinson,^{2,9} Chaim M. Bell,^{2,3,10} and Andrew M. Morris^{2,3,9}

847 SAB patients, 506 (60%) patients received an ID consultation

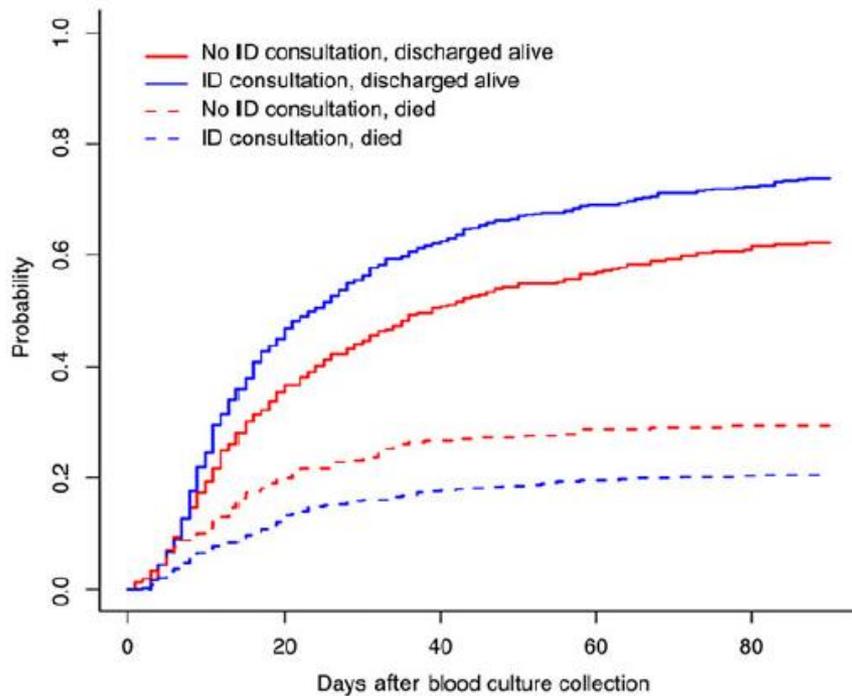


Table 2. Infectious Disease Consultation Recommendations

Recommendations	No. (%) of 506 ID Consultation Cases
Removal of infectious foci	
Removal of intravascular device	96 (19)
Surgical/interventional source control drainage	115 (23)
Cardiovascular surgery consultation	24 (5)
Repeat blood culture in 2–4 d	204 (40)
Antibiotic therapy	
Use of β -lactam in MSSA bacteremia	324 (64)
≥ 14 d of antibiotic therapy in uncomplicated SAB	146 (29)
≥ 28 d of antibiotic therapy in complicated SAB	272 (54)
Echocardiography	
Transthoracic echocardiography	222 (44)
Transesophageal echocardiography	114 (23)
Imaging	
Head CT	14 (3)
Head MRI	7 (1)
Chest CT	43 (9)
Abdominal ultrasound	23 (5)
Abdominal CT	28 (6)



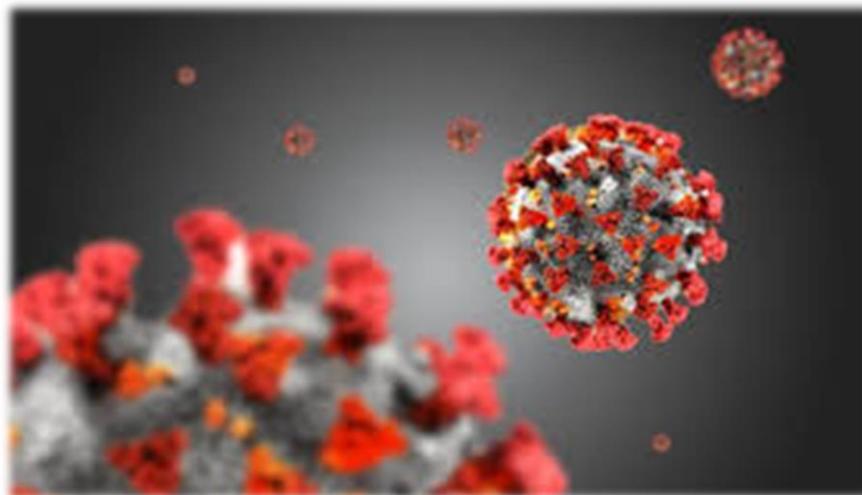
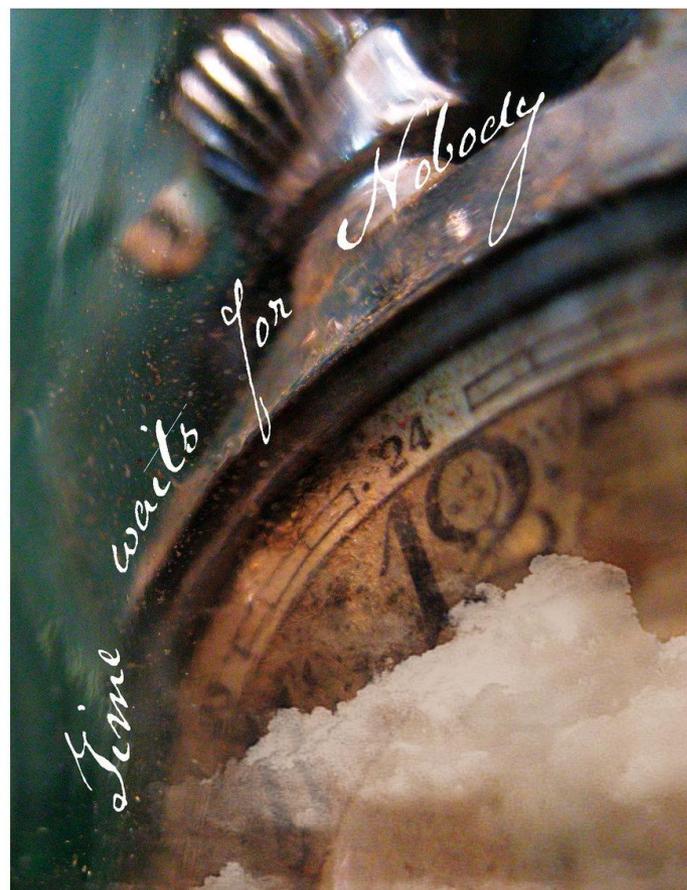
Automatic notification and infectious diseases consultation for patients with *Staphylococcus aureus* bacteremia[☆]

Lucas Djelic^a, Nisha Andany^{a,b}, Jeffrey Craig^a, Nick Daneman^{a,b}, Andrew Simor^{a,b,c}, Jerome A. Leis^{a,b,d,*}

- 3-year quasi-experimental evaluation on patients with SAB
- standardize timely ID consultation **through automatic notification by the Microbiology laboratory.**
- increased ID consultation for SAB (70% versus 100%, $P=0.001$) and decreased time to consultation (14.5 versus 4 h, $P<0.001$).
- Adherence to Quality of Care Indicators (QCIs) increased (45% versus 87%, $P<0.001$), transfer to intensive care unit decreased (38% versus 16%, $P =0.03$),

Automatic ID Consultation for Inpatients With COVID-19: Point, Counterpoint, and a Single-Center Experience

Cynthia T. Nguyen,¹ Gregory Olson,² Mai T. Pho,² Alison K. Lew,¹ David Pitrak,² Jina Saltzman,² Aniruddha Hazra,² Kenneth Pursell,² and
Natasha N. Pettit¹; on behalf of the University of Chicago Medicine ID COVID Consult Study Group



Inpatient ID consultations using real-time interactive telemedicine assessments

A Retrospective Cohort Study to Assess the Impact of an Inpatient Infectious Disease Telemedicine Consultation Service on Hospital and Patient Outcomes

Daniel Monkowski,¹ Luther V. Rhodes III,¹ Suzanne Templer,² Sharon Kromer,³ Jessica Hartner,⁴ Kimberly Pianucci,⁵ and Hope Kincaid⁶

- 244 patients managed at 1 remote hospital
- 171 patients were seen via teleID
- all 73 patients in the pre-teleID group were transferred from the remote hospital to the hub hospital, only 14 (8.2%) of all remote hospital patients assessed by teleID were transferred.
- Patient LOS across both facilities decreased when patients were seen via teleID, compared to pre-teleID

LOWERING DEMAND FOR ANTIMICROBIALS AND REDUCING UNNECESSARY USE



Public
awareness



Sanitation
and hygiene



Antibiotics in
agriculture and
the environment



Vaccines and
alternatives



Rapid
diagnostics



Human
capital

**TACKLING DRUG-RESISTANT
INFECTIONS GLOBALLY:**
FINAL REPORT AND
RECOMMENDATIONS

THE REVIEW ON
ANTIMICROBIAL RESISTANCE

CHAired BY JIM O'NEILL

MAY 2016