ples. Mixed infection (minority strain ≥3% in Deeplex or any level in MAGMA) occurred in 3 samples. One sample was reported as 91% Mtb 2.2.1 + 8% Mtb 4.4.1.1 by MAGMA, and 87% M. bovis + 39% undefined Mtb lineage by Deeplex. One sample was reported as 99% NTM + 1% Mtb by MAGMA but 100% Mtb 4.3 by Deeplex. Another sample contained Mtb lineages 1, 2, 7, 4, 5, animal strains and M. canettii (4%) + undefined Mtb lineage (96%) in Deeplex and 100% Mtb 4.1.1.3 in MAGMA. The fourth sample contained two undefined lineages at 11% and 89% in Deeplex but 100% Mtb 2.2.1 in MAGMA. According to Deeplex, 33/53 samples shared an identical spoligotype (7 groups of size 2-19) and 20/53 had a unique spoligotype. Based on a 12 SNP cut-off, 4 samples were part of a WGS cluster and 55/59 were unclustered. Of the spoligotype groups, only one group of the 7 groups at least 2 identical spoligotypes had a SNP distance <12. Strain typing for strains identified by MAGMA as lineage 4 were varied in the Deeplex analysis, apart from strains identified by both as sublineage 4.3

Discussion: A significant proportion of the samples analysed by Deeplex were reported as "Other than lineage 4.9". This definition is not informative for strain typing. The resolution of Deeplex is less granular than WGS; it failed to assign sublineage for approximately two-thirds of the samples for which it could assign lineage. Deeplex particularly struggles with strain typing for lineage 4 strains unless they are lineage 4.3 strains.

Conclusion: Our findings highlight poor phylogenetic resolution of tNGS, limiting its ability to inform public health interventions.

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Plan-Do-Study-Act (PDSA) Cycle for Antimicrobial Stewardship in Trauma Centre: Implementation Research for Rational Use of Antimicrobials in Orthopedic Patients

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Introduction: One of the most effective measures to reduce unnecessary antibiotic exposure and its adverse outcomes is the implementation of antibiotic stewardship program (ASP). Our Advanced Trauma Centre (ATC) is a tertiary referral centre in Northern India. We adopted a PDSA cycle as a time series analysis of rational antimicrobial use. The objectives of study were to measure the change in antibiotic use per patient in different phases of PDSA cycle, rational use of antibiotics, change in antibiotic prescribing practices and compliance with antibiotic guidelines.

Methods: After the ethics committee approval, the study was collaborated with department of Orthopedic, Microbiology and Hospital Administration. We designed antimicrobial stewardship form specific for ATC. We implemented ASP for orthopaedic patients in the trauma centre from March 2019 in 4 phases using the implementation Model, Plan–Do–Study–Act (PDSA) cycle. We have analysed 3 phases (till May 2023) and 4th phase is continuing from July 2023.The primary source of patient information: patient demographics, cause and nature of injury, route, dose, and frequency of antimicrobials prescribed, length of therapy(LOT), defined daily dose (DDD), duration of hospital stay, culture reports, was from inpatient case file and hospital information system. We made various strategies across the phases are as follows: antibiotic protocol for open and closed fractures, educating trauma nurses and resident doctors (bed-side bite-size educative sessions), prospective audit and feedback, created WhatsApp group involving orthopaedics faculty and residents to post randomly selected Orthopaedic cases for regular ASP rounds, Microbiology Report tracking and intensification of infection control measures.

Results and Discussion: The total number of patients in 3 Phases were 261, 210, 149 respectively. The mean age was similar across the phases: 35.3 years, 35.7 years and 36.3 years. Culture-based-antimicrobial-prescriptions increased from 0.7% (Phase I) to 1% (Phase II) to 19.7% (Phase III). The proportion of patients with closed fractures who received antibiotics apart from surgical prophylaxis was reduced from 92.6% to 74% to 50%. Compliance with prophylaxis guidelines in the study was 11% in Phase 1, 26.5% in Phase 2, and 55.4% in Phase 3. The DDD per 1000 patient days was 1212.8, 677.8, and 742.6 over phases. The Duration of Treatment per 1000 patient days in Phase 1 was 800.9, in Phase 2 was 686.4, and in Phase 3 was 783.5. The LOT per 1000 patient days in Phase 1 was 442.8, in Phase 2 was 331.4, and in Phase 3 was 544.7.

Conclusion: In a tertiary care centre, referred cases of multiple open fractures with potential risk of infection is a considerable challenge for rational antibiotic use, we have demonstrated that the implementation of an efficient ASP with the help of an effective PDSA cycle can drastically better prescribing practices to improve treatment outcomes.

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Point prevalence surveys of acute infection presentation and antibiotic prescribing in selected primary healthcare facilities in North-West and Gauteng provinces of South Africa

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Background: The effective management of infections is threatened by antimicrobial resistance (AMR), with an estimated 1.27 million deaths directly attributed to AMR in 2019. There are concerns with antibiotic prescribing in ambulatory care, particularly primary healthcare (PHC) level, and lack of adherence to prescribing guidelines in South Africa, driving AMR. Understanding current infection presentation rates and antibiotic prescribing patterns are needed to develop interventions to improve appropriate antibiotic prescribing in PHC facilities and check compliance with guidelines such as the WHO AWaRe Antibiotic Book. The Antibiotic Prescribing in Primary Healthcare Point Prevalence Surveys (APC-PPS) study is being undertaken globally as part of the 'Antimicrobial resistance, prescribing and consumption Data to Inform country antibiotic guidance and Local Action' (ADILA) project to inform this data gap.

Methods: In South Africa, the APC-PPS study is currently being conducted at four PHC clinics in the North-West province and three PHC clinics in Gauteng province. Two surveys are conducted at each facility over a two-week period (one set) and each set is repeated every 4-6 weeks for a total of four sets (eight surveys) over six months to capture any seasonal differences in infection burden or antibiotic prescribing. Each survey is conducted for half a day, representative of a standard clinic session. Data are collected electronically using Open Data Kit (ODK) Collect. For each survey, anonymous consultation data of all patients presenting with acute infection symptoms (present for <14 days) are collected including demographics, underlying conditions, presenting infection symptoms and antibiotic prescribing.

Results: As of April 2024, six surveys in North-West province and two surveys in Gauteng province have been completed with data for 615 patients were recorded. Overall, there were 304 males (49%) and 311 females (51%). The most common symptoms were genital discharge (n=134; 21.8%), painful urination (n=113; 18.4%), acute cough (n=109; 17.7%), sore throat (n=83; 13.5%) and skin swelling or pain (n=67; 10.9%); patients could have had more than one symptom. At least one antibiotic was prescribed for 87.0% of patients (n=533). More than half (53.4%; n=455) of antibiotics prescribed were Access antibiotics, 46.6% (n=397) were Watch antibiotics, and no Reserve antibiotics were prescribed. Ceftriaxone (n=182; 29.7%), amoxicillin (n=180; 29.4%), azithromycin (n=174; 28.4%) and metronidazole (n=170; 27.7%) were the most frequently prescribed antibiotics.

Conclusion: The preliminary results show very high rates of antibiotic prescribing in primary healthcare and high use of Watch antibiotics in this setting. This is a concern which warrants the need for antimicrobial stewardship programmes and further assessment of appropriateness of prescribing in ambulatory care. The study demonstrates the value of collecting infection and prescribing data based around the WHO AWaRe Antibiotic Book guidelines and will enable South Africa to evaluate its antimicrobial use.

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Policy impact of a COVID-19 Response Team: Global perspective and UK case study

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Introduction: Scientific evidence, along with other factors, can play an important role in policy decision making. Advanced analytics and mathematical models can produce such scientific evidence to inform policy decisions and mobilise action. The Imperial College COVID-19 Response Team (ICCRT) provided timely and robust epidemiological analysis essential to inform the policy response to governments and public health agencies around the world. We aim to quantify the impact of the work on policy and define policy relevant evidence.

Methods: All outputs published by members of the ICCRT between 01-01-2020 and 28-02-2022 were inductively analysed to identify emerging themes. A systematic search of the Overton database identified policy document references as an indicator for policy impact. Statistical analyses of outputs was conducted to compare outputs and policy impact across pandemic time windows (pre-vaccination; vaccination) and themes.

Results: We identified 620 outputs (pre-prints 15.6%, reports 29.0%, journal articles 37.3% and news items 18.1%). More than half (55.9%) of all reports and preprints were subsequently peer reviewed and published as a journal article after 201.8 days (mean).

The team authored 116 outputs (18.7%) outputs published by the UK government, 130 outputs (20.9%) were available to or considered by UK government at. Of all non-governmental published outputs, 43.1% (217 of 504) were referenced in one or more policy documents from 41 countries or regions in 26 different languages. The outputs were referenced in 1746 policy documents, with a mean time between output publication and policy reference of 255.7 days (mean).

We report 13 themes across 620 outputs of which severity, healthcare demand and capacity (n=123, 19.8% of outputs) was most frequently theme. The most frequent theme of outputs referenced in policy documents was non-pharmaceutical interventions (n=453, 25.9% of policy references). The themes of outputs and what was policy relevant changed over time accordingly.

The communication format of the output was relevant to the impact of the work on policy. Public reports and preprints were crucial during the COVID-19 pandemic to the timely distribution of important research findings. Evidence produced by the ICCRT and of relevance to policymakers changed accordingly during the course of the pandemic.

Conclusion: Work published by the ICCRT impacted global and domestic policy, particularly in the UK. Understanding which evidence was relevant to policy decision making can help direct focus and resources more effectively during a future public health emergency of international concern. The policy impact from ICCRT news items highlights the effectiveness of this unique communication strategy ensuring research informs policy decisions more effectively. Communication channels that were established can be leveraged for future response strategies. Further research is required to better understand informal data-to-policy-pathways, improve transparent and bidirectional communication and prepare an effective response to future public health emergencies.

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Population pharmacokinetic study of colistin for dose optimization in patients with acute on chronic liver failure (ACLF) patients

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Introduction: Acute on chronic liver failure (ACLF) is characterized by severe systemic inflammation and multiple organ failures, posing high mortality risks, particularly in cirrhotic patients. The complex alterations in drug distribution and elimination kinetics observed in ACLF and sepsis patients often result in considerable variability in antibiotic concentrations. Conducting a population pharmacokinetic (PK) study among individuals with hepatic dysfunction is crucial for guiding initial antibiotic dosing in this patient population. Here, we aimed to conduct a population pharmacokinetic study of colistin in patients with hepatic failure to elucidate drug kinetics and optimize dosing.

Methods: We enrolled patients with ACLF receiving colistin for suspected or proven hospital-acquired infections caused by multi-