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million for as early as Feb 22, a rate matched by the UK two weeks later. Germany also steeply increased its testing rate starting Mar 10. The total number of samples tested in Germany was 918,460, as of Mar 29 and the case doubling time was 9 days. S. Korea had tested 443,273 (1% of the total population) cases as of Apr 3 and the case doubling time was 33 days. In contrast, test numbers in India were negligible, and doubling time was 4 days^{1,2}. Importantly, testing capacity globally is currently limited. S. Korea, at number three after US and China in terms of testing kit production, can only support a capacity of 1,35,000 tests per day at present³. Additionally, ICMR guidelines such as "Laboratory test should only be offered when prescribed by a qualified physician" and 48 hours of turnaround time for test results further delay case identification and isolation⁴. **Conclusions:** If India was to mirror the testing rate of S. Korea, ~15 million individuals may have to be tested within coming few weeks to be able to bend the curve of the COVID-19 cases. A balance of both the strategies – exponentially increasing testing and social distancing will be crucial. Sources:

1. <https://ourworldindata.org/coronavirus> | "testing-for-covid-19, accessed on Apr 6, 2020
2. Statista, <https://www.statista.com/statistics/1104809/days-for-covid19-cases-to-double-select-countries-worldwide/>, accessed on Apr 6, 2020
3. News: http://www.arirang.com/News/News_View.asp?nSeq=254993
4. MoHFW website, <https://www.mohfw.gov.in/pdf/NotificationofICMguidelinesforCOVID19testinginprivatelaboratoriesIndia.pdf>, accessed on Apr 7, 2020

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IMPACT OF CRE INFECTIONS ON HOSPITAL LOS AND MORTALITY IN ASIA

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Objectives: Carbapenem-resistance Enterobacteriaceae (CRE) are considered a critical public health problem, characterized by being difficult-to-treat and high levels of multi-drug resistance. This has led to negative clinical outcomes and higher healthcare costs. This study aims to understand the existing evidence of the burden of CRE infections in Asia. **Methods:** A systematic literature review (SLR) and meta-analysis of randomized controlled trials and observational studies published in the last 10 years were conducted following Cochrane and PRISMA guidelines. Evidence-Based Medicine Reviews, EMBASE and Medline were searched on October 14, 2019. Studies were evaluated for comparability and only those with comparable baseline characteristics were included. The metafor package in R was used to conduct the meta-analysis. Pooled results for adult hospital length of stay (LOS) (6 studies) and all-cause mortality (8 studies) are reported here. **Results:** Overall, there was limited published data reporting on CRE burden in Asia. Hospital LOS ranged from 19 to 54 days, 42 days (China; 3 studies), 36 days (Malaysia; 1 study), 23 days (Taiwan, 1 study) and 19 days (India, 1 study). The pooled mean hospital LOS was 34 days. The mean difference in LOS was higher for CRE patients compared to non-CRE patients by 9.51 days ($p < .0001$), based on 3 studies. Hospital mortality among CRE patients ranged from 35% to 46%. The pooled all-cause mortality was 40% using all studies. Comparing CRE to non-CRE patients, mortality risk was 3.67 times ($p < .0001$) greater for CRE patients. **Conclusions:** Pooled risk estimates from this meta-analysis revealed that CRE infections were associated with longer hospitalization and an increased mortality risk. Our analysis highlights the importance of targeted infection prevention, control programs and antimicrobial stewardship activities to contain CRE in Asia.

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BENEFIT DESIGN CONSIDERATIONS DURING EMERGENCIES: LESSONS FROM COVID 19

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The Philippines declared a public health emergency owing to the rapid increase in Corona Virus Disease 2019 (COVID 19) cases. Given the highly infectious and severe nature of COVID 19, many individuals were infected and cost of care was higher compared to usual cases of influenza or pneumonia. Majority of cases were admitted to private hospitals where balance billing is usually practiced, leaving many patients saddled with huge hospital bills. The Philippine Health Insurance Corporation (PhilHealth) was tasked to cover for health care costs of COVID 19 cases in the country. **Objectives:** Design benefit packages for COVID 19. **Methods:** Costing the benefit package involved defining a basic clinical profile and pathway for COVID 19 using available guidelines and consultations with experts. Designing the package took into consideration the full continuum of care and available financing from government. Cost estimates and design features were periodically reviewed as guidelines were evolving. Development of the packages was also expedited. **Results:** Benefit packages for testing, community quarantine and pneumonia (mild, moderate, severe and critical) were developed along with their corresponding case rates. Cost drivers differed across package types (e.g. PCR procedure for testing; drugs and treatment procedures for pneumonia admissions). To deal with the uncertainty in costs and clinical profile of COVID 19 cases, PhilHealth initially decided to cover the full

cost of care during the quarantine period prior to introducing case rates. Rules on eligibility for benefits and claims processes were likewise relaxed to ensure access and adequate financial risk protection. **Conclusions:** Benefit development during emergencies such as with the COVID 19 pandemic can be undertaken quickly even with limited information. Given uncertainty in costs and clinical profiles, social insurance agencies may opt to be liberal in granting benefits. Periodic reviews will be necessary to update the packages and ensure the sustainability of the fund.

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COMPARISON OF ANTIBIOTICS POLICIES BETWEEN EUROPEAN UNION COUNTRIES AND JAPAN

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Objectives: Drug resistance is one of the major problems across the world. To address this, Japanese government has been promoting development of new antibiotics. This is a comparative study between European Union countries and Japan on antibiotics policy and its impact in the recent years. **Methods:** Governmental reports, Chuikyo (Central Social Insurance Medical Council) documents (JAPAN), and policy papers were reviewed along with a literature review and web browsing. The collected information were summarized and analysed in comparison to the European Union countries. **Results:** Drug resistance has become a prominent issue in Japan since late 1980. To combat this, Japanese government introduced measures to promote the development of new antibiotics in 2010 and the optimal use guidance of antibiotics in 2016. Of the 18 antibiotics that were launched in Japan in the past 10 years (2010-2019), 16 were launched after the new government measures. However, despite the aggressive government policies, the number of antibiotics launched remained lower compared to other EU countries. **Conclusions:** The development of new antibiotics is promoted across the world to combat drug resistance and to help people from infectious diseases at an early stage. Despite the aggressive measures taken by the Japanese government, number of launched antibiotics remained low compared to other EU countries, reflecting the medical drug lag that still exists in Japan. While reducing drug resistance by reinforcing appropriate use of existing and future antibiotics is equally important, there is an urgent need for the Japanese government and pharmaceutical industry to work together to develop effective new antibiotics.

Infectious Diseases - Methodological & Statistical Research

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PREDICTING INVASIVE CANDIDIASIS IN INTENSIVE CARE UNITS

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Objectives: Despite advances in antifungal treatment, the mortality associated with invasive candidiasis (IC) remains high. Early diagnosis of IC can be challenging, leading to the high morbidity and mortality. To assist early detection, the objective of the study was to develop a tool that predicts IC in intensive care units. **Methods:** Data from the Medical Information Mart for Intensive Care III database were used to construct a retrospective cohort of patients with infection. IC was defined if a patient (1) had a positive microorganism test for IC, or (2) had a diagnosis code indicating IC; or (3) had a sepsis diagnosis and received intravenous antifungal treatment. Candidate predictors included patient demographics, comorbidities, primary diagnosis, procedures, composite severity scores (e.g. SOFA, ASP III), laboratory tests, and medications used. An iterative purposeful selection was used to select the most prognostic features. A risk score was calculated for each patient to enumerate the IC risk. Model performance was evaluated using classification, discrimination, and calibration. Internal validation was conducted using an independent subsample of the study cohort. **Results:** A total of 15,580 eligible patients were included, including 1,368 (8.8%) with IC. The average age of the cohort was 81 years and 46.5% were female. Top prognostic features included total parenteral nutrition, gastrointestinal surgery, central line, APS III, neutrophil count, weight, and preexisting conditions such as cancer, hepatic disorders, and AIDS. The prediction model has a sensitivity of 0.74, a specificity of 0.75, and a c-statistic of 0.82. Calibration results show consistently increased IC rates for patients with higher predicted risk scores. The internal validation showed comparable results. **Conclusions:** The prediction tool shows good predictive performance in evaluating the risk of IC among patients receiving intensive care. Accurate early detection of IC followed by appropriate treatment is expected to prevent mortality and improve clinical outcomes.

Infectious Diseases - Patient-Centered Research

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VACCINATION RATES AMONG THE GENERAL ADULT POPULATION AND HIGH-RISK GROUPS IN EU, US, JAPAN, SOUTH KOREA AND TAIWAN

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