isolates. MRSA and methicillin-susceptible S. aureus were resistant to trimethoprim/sulfamethoxazole, a commonly used drug at UTH. S. pneumoniae was resistant to most drugs against which it was tested.

Conclusion. MDROs were common at UTH with carbapenems indicated for empiric GN therapy. Further research should assess the extent and depth of antibiotic resistance in Zambia. Antibiotics provide critical information for clinicians to strategically use antibiotics.

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452. Spectrum of Respiratory Pathogens Detected by Multiplex PCR in a Study of Respiratory Tract Infections Among Travellers
Satoko Katsumi, MD, PhD1; Maki Nagashima, PhD2; Yuta Toda, Dr3; Saho Takaya, MD, MSc; Ken Yamamoto, MD, MD3; Kayoko Hayakawa, MD, PhD and Norio Ohmagari, MD, MSc, PhD4; 1Disease Control and Prevention Center, National Center for Global Health and Medicine, Tokyo, Japan; 2National Centre for Global Health and Medicine, Shinjuku-ku, Japan; 3Disease Control and Prevention Center, National Center for Global Health and Medicine, Tokyo, Japan; 4Center for Global Health and Medicine (NCGM), Tokyo, Japan, 5e, Detroit, Michigan, 6AMR Clinical Reference Center, National Center for Global Health and Medicine, Tokyo, Japan

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Background. Respiratory tract infections (RTI) are a significant cause of health problems, accounting for about 10% of consultations in returning travelers. Nevertheless, the precise microbial etiology is not identified in many cases.

Methods. Prospectively collected 63 respiratory specimens (sputum or throat swab) from patients presented with respiratory symptoms (cough, sputum, chest pain, dyspnea, tachypnea, or abnormal findings of chest auscultation) after travel were tested using multiplex real-time PCR. The FTD Respiratory pathogens 33 (FastTrack diagnostics, Ltd.) can simultaneously detect 33 different respiratory pathogens directly from respiratory specimens. This test ran in the PCR-Only mode on BD MAX™ (Nippon Becton Dickinson Company, Ltd.) and LightCycler480 System (Roche).

Results. Fifty-nine consecutive cases were included in the study. Thirty-nine cases were diagnosed as non-specific upper respiratory tract infections, five cases were influenza, bronchitis, pneumonia, three cases was acute sinusitis, and one case was acute pharyngitis, dengue fever. Twenty-four cases had returned from travel in Southeast Asia, nine from Africa, and eight from Latin America, seven from South Asia, six from middle east, three from North America, two from Oceania, and one from Europe. Of the 59 specimens analyzed, 48 (81.4%) tested positive for pathogens whereas 11 tested negative. Commonly detected pathogens were Haemophilus influenzae (14 cases; 23.7%), influenza A (10 cases; 17.0%), rhinovirus (9 cases; 15.2%), Staphylococcus aureus (8 cases; 13.6%), Moraxella catarrhalis (8 cases; 13.6%), Streptococcus pneumonia, coronaviruses OC43, and Mycoplasma pneumoniae (4 cases; 6.8%, respectively). Multiple pathogens were detected in 30.5% of the specimens. In 14 cases (23.7%), both virus and bacteria were detected from one specimen.

Conclusion. Not only viruses, bacterial pathogens were detected frequently than expected in the patients of RTI. Comprehensive molecular testing such as multiplex real-time PCR would change our understandings of epidemiology of RTI among travelers.

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453. Understanding Travel Medicine Provider’s Risk Assessment of Travel-Associated Diseases
Robert Ulrich, MD1 and Scott Weisenberg, MD2; 1Infectious Diseases, New York University School of Medicine, New York, New York and 2New York University, New York, New York

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Background. Pre-travel medical consultations attempt to reduce travel-associated risks by behavioral modification, vaccination, and medications. Provider understanding of quantitative risk of commonly discussed travel topics is poorly characterized. We investigated travel medicine provider understanding of quantitative risk of common travel-associated diseases, and explored how providers relay risk estimates to travelers.

Methods. After institutional review board (IRB) approval, an online anonymous survey was sent to the International Society for Travel Medicine Listserv. Travel medicine experience, practice patterns and demographics were recorded. Respondents estimated quantitative risk of various destination-specific diseases. Descriptive statistics were completed.

Results. Of 114 respondents, most were experienced travel medicine providers (79% saw >6 travel visits monthly). Overall risk estimates are in Table 1. Compared with published literature, providers gave accurate risk estimates for some diseases (yellow fever, traveler’s diarrhea), but overestimated quantitative risk for others (Japanese encephalitis, hepatitis A, cholera). Intercorrelation range was greatest for Japanese encephalitis and cholera, reflecting a wider range of risk estimates. Most (81%) providers used general risk descriptions (high, low, none) and a minority (14%) discussed quantitative risk with travelers.
Conclusion. Experienced travel medicine providers overestimated risk of several vaccine preventable illnesses, though risk estimates for others were close to published estimates. Most providers do not use quantitative risk in pre-travel consultations. Improved quantitative risk understanding may improve the quality of pre-travel consultations.

Table 1. Provider’s Risk Estimates for Selected Travel-Associated Illnesses

| Illness                      | Traveler’s diarrhea (India) | Malaria (W. Africa) | Hepatitis A (Kenya) | Influenza (Indonesia) | Yellow fever (W. Africa) | Yellow fever (Brazil) |
|-----------------------------|----------------------------|---------------------|---------------------|----------------------|------------------------|---------------------|
| Median Interquartile Range  | 1.3                       | 1:3                 | 1:100               | 1:100                | 1:100                  | 1:100               |

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454. Barriers and Facilitators to Control of Hospital Acquired Infections in Ethiopia

Madeline Kenzie, BS; Nasia Safdar, MD, PhD; Alemsegd Abdissa, PhD; Daniel Yilma, MD and Dawid Siraj, MD; Medicine, University of Wisconsin School of Medicine and Public Health, Madison, Wisconsin, 1Medicine, University of Wisconsin, Madison, Wisconsin, 2Infectious Diseases, University of Wisconsin-Madison, Madison, Wisconsin

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Background. Given the complex, interdisciplinary nature of infection prevention, a systems approach may be useful to promote and sustain effective infection prevention practices. The Systems Engineering Initiative for Patient Safety (SEIPS) model provides a framework that can be used to identify barriers and facilitators of infection control practices and evaluate interactions between structures, processes, and outcomes.

Methods. A qualitative study was done to evaluate barriers and facilitators to implementation of effective infection control practices at Jimma University Hospital in Jimma, Ethiopia. Twenty-two semi-structured interviews of hospital employees, selected by convenience sampling, were conducted to assess the five components of SEIPS framework: person, physical environment, tasks, organization and tools. The interviews were transcribed, coded for themes, and analyzed using the software Dedoose.

Results. The primary facilitators to effective infection control were identified at the task, organization, and person level. Prominent themes included a manageable workload, a management system supportive of institutional feedback, sufficient budget, and positive individual attitude toward improving infection control. The primary barriers to effective infection control were found to be the lack of technology and tools, person, and organization levels. The major themes within these levels include poor supply chain management leading to personal protective equipment (PPE) shortages, an inconsistent and incomplete training program for employees, a lack of infection control policies, a lack of involvement of environmental services, and a nurse rotation program that increases unit staff turnover.

Conclusion. To address the identified barriers, possible interventions to consider should include: developing infection control policies and protocols, using these to implement a regular staff training program, incorporation of environmental services to the nursing care team, identification and training infection control team member to manage the PPE supply chain, and establishing an HIAT surveillance program to better identify current risk areas as well as track progress.

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455. Epidemiological Surveillance in Points of Care for Refugees/Migrants: The 2016–2017 Experience in Greece

Kassiani Gkikompatoulopou, RN, MPH, PhD; Theodore Lytras, MD, MPH; Eleni Triantafylloiu, MPH; Kassiani Mello, PHD; Danai Pervanidou, MD, MPH; Ourania Kalkouni, MD; Angeliki Lambrou, RN, MPH, ScD; Anthi Chrysoyotomou, RN, MSc; Anastasia Andreopoulou, Health Visitor; Stavroula Gouzelou, BSc, MSc, PhD; Panagiotos Katsoumas, BSc, MC; Agoritsa Baka, MD; Sotiris Tsiroas, MD, MSc, PhD, FIDSA; Theano Georgakopoulou, MD, MSc, MPH, PhD; and Takis Panagiotopoulos, Prof PhD. **(HEC): Hellenic Center for Diseases Control and Prevention, Athens, Greece, **Hellenic Center for Disease Control and Prevention, Athens, Greece, **4th Department of Internal Medicine, University General Hospital (AHRQ) patient safety culture survey questions and unit performance on healthcare-associated infections (HAIs) and hand hygiene compliance.

Methods. Data on number of cases per age group for 14 syndromes of public health (PH) interest were collected daily from primary healthcare units of refugee/migrant hosting centers in the country, along with the number of consultations from any cause. Additional information enabling case-finding was collected for syndromes representing diseases that require PH measures at an individual level. Observed daily proportion mortality (PDM) was compared to predicted PM using a quasi-Poisson regression model. PM ≥ 2 standard deviations from expected was defined as a “warning signal.” “Warning signals” appearing for 22 consecutive days were considered “alert signals.” Signals were evaluated daily and public health measures were implemented as necessary.

Results. The number of centers participating in the system ranged between 27 and 51. Weekly reporting rate reached 96%. From 16 May 2016 to 31 December 2017, 500,166 consultations from any cause were reported, with 28,300 cases of the syndromes under surveillance (5.6%). Syndromes with the higher PM were respiratory infections with 42% (wheeze), gastroenteritis with 39% (diarrhea, nausea), and rash or skin infection with 30% (95% of whom 91% were varicella cases, with no measles or rubella identified). Two hundred fifteen cases of suspected tuberculosis were referred to hospitals for further diagnostic testing and treatment. Of 92 cases of jaundice with acute onset, 85% were verified as hepatitis A (triggers interventions such as vaccination). None of the produced signals corresponded to a major PH incident, all being of low severity and duration.

Conclusion. Infections represented a small proportion of refugees’ health problems. Syndromic surveillance in hosting centers guided PH action and confirmed no major PH event.

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456. Discrepant Trip Experiences Among Travelers Attending a Tertiary Care Center Family Travel Medicine Clinic

Nancy Nashid, MD, FRCP, FAAP; Jacqueline Wong, MD, FRCP, FAAP; Lisa G. Pell, PhD, MPH; Michelle Science, MD, MSc, FRCP; Ray Lam, MN; Debbie Bruch, RN, and Shawn K Morris, MD, MPH, FRCP, FAAP. **(HEC): Division of Infections Diseases, Department of Paediatrics, The Hospital for Sick Children, Toronto, ON, Canada, **Centre for Global Child Health, The Hospital for Sick Children, Toronto, ON, Canada

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Background. International travel can expose travelers to a number of health risks. Pre-travel consultation helps prepare travelers for health concerns that might arise from the accommodation of risk, migration strategies, and relevance of pre-travel advice is dependent on whether travelers adhere to their planned travel itinerary and activities.

Objectives. We aimed to determine the proportion of returned travelers whose actual travel itineraries differed from their planned travel plans (defined as discrepant trip experiences). We also aimed to identify traveler or trip characteristics associated with discrepant trip experiences.

Methods. We conducted a prospective cohort study at the Hospital for Sick Children’s Family Travel Medicine Clinic between September 2014 and December 2015. Pre- and post-trip questionnaires were compared with identify discrepant trip experiences.

Results. Among 186 participants, 121 (66%) reported their actual travel itineraries upon their return. A preliminary analysis of 53 participants revealed a median participant age of 37 years. Most common reasons for travel were vacation (n = 29, 55%) and visiting friends and/or relatives (n = 12, 23%). Median trip duration was 17 days (IQR 13 days); most commonly visited regions were Central America (n = 19, 36%), Asia (n = 18, 34%), and South America (n = 5, 9%). In total, 51 actual travel itineraries (96.2%, 95% CI 91–100) were discrepant from the pre-travel plans that were documented in the trip itinerary. Additional activities (e.g., hiking, caving) (n = 42, 82.3%) and unplanned environments visited (e.g., altitude, jungle) (n = 32, 62.7%) during travel were the trip characteristics most likely to be discrepant. We did not identify any traveler demographic features or planned trip characteristics that predicted either discrepant trip experiences.

Conclusion. Based on our preliminary analysis, the majority of travelers reported discrepant trip experiences. We plan to complete the analysis of the full cohort (N = 121) and also to quantify if the discrepant features meaningfully altered health risks during travel. This study informs practitioners providing pre-travel consultation to consider broader counseling as discrepancies from planned travel are common.

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457. Relationship Between Healthcare Worker (HCW) Perception of Safety and Rates of Healthcare-Associated Infections (HAI) and Hand Hygiene (HH) Compliance

Marc Kowalkowski, Ph.D.; Monica Schmidt, MPH, PhD; Shelley Kester, MHA, BSN, RN, CIC; Kristin Fischer, BM, MM, and Catherine Passeretti, MD, 1Atrium Healthcare System, Charlotte, North Carolina, 2ConelHealth, Greensboro, North Carolina, 3Medicine, Atrium Health, Charlotte, North Carolina

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Background. Many facilities complete the Agency for Healthcare Research and Quality (AHRQ) patient safety culture survey. Our goal was to evaluate associations between healthcare worker (HCW) perception of safety culture scores and unit performance on healthcare-associated infections (HAI) and hand hygiene compliance.

Methods. 11,257 HCW across 10 acute care hospitals and four rehabilitation facilities completed the 2016 AHRQ patient safety survey. Unit-level standardized

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