# **Appendix 1.** Complete list of research questions

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| **Question number** | **Patient/population** | **Intervention** | **Control** | **Outcomes** |
| 1 | People having a long-term urinary catheter | Periodic review of requirement for catheter | Standard care | Not stated |
| 2 | Infants of mothers with infection or colonisation | Breast feeding | No breast feeding | Transmission of infection to infant |
| 3 | MRSA positive infant | Breast feeding | No breast feeding | Transmission of MRSA to mother |
| 4 | Researchers developing interventions to increase compliance with hand hygiene in hospitals | Working in partnership with patients | Not working in partnership with patients | Not stated |
| 5 | People with antibiotic resistant bacteria | Single room isolation | Open ward care | 1. Prevention of transmission of diseases. 2. Adverse impact on patient care. 3. Mental health |
| 6 | High risk people with antibiotic resistant bacteria | Alternatives to single room isolation | Single room isolation | 1. Better care of high risk patients. |
| 7 | Healthcare professionals, volunteers, cleaners | Methods to improve resources, knowledge, and training |  | 1. Better identification and treatment of HCAIs 2. Knowledge about aseptic techniques before and after training 3. Number of people trained |
| 8 | People in urban environment | Access to natural environment and exercise | Current standard practice | 1. Prevention of respiratory infection |
| 9 | Nurses | Interventions to stop nurses reusing antimicrobial wipes |  | 1. Stop reuse of antimicrobial wipes. |
| 10 | General population | Cause for MRSA including steroids |  | Not applicable |
| 11 | Pregnant women | Screening for MRSA and streptococcus | No screening | 1. Prevention of transmission of MRSA and streptococcus. |
| 12 | Neonates in NICU | Screening for staphylococcus and infectious organisms | No screening | 1. Prevention of transmission of infection in NICU |
| 13 | Vulnerable patients being cared for in their own homes | Infection prevention and control training | No training | 1. Prevention of transmission of HCAI. |
| 14 | Healthcare professionals taking samples sent to microbiology lab | Training to provide appropriate clinical information with samples | No training | 1. Distinguish between colonisation and infection |
| 15 | Children with earache | Treatments |  | Not stated |
| 16 | Patients undergoing surgery for more than 1.5 hours | Direct contact warming for normothermia | Forced air for normothermia | 1. Surgical site infection |
| 17 | Patients with bone and joint infection | Antibiotics for 2 weeks or 6 weeks | Antibiotics for 12 weeks | 1. Therapeutic failure at 1 year |
| 18 | Patients with low back pain for 3 months or more | Antibiotics | No antibiotics | 1. Patient-reported outcome measures at 1 year |
| 19 | Farmers | Reduced antibiotics in farming | Current standard practice | 1. Decrease antibiotic resistance. |
| 20 | Patients with ventilator-associated pneumonia | Best antibiotic treatment |  | Not stated |
| 21 | Critically ill patients, patients admitted to hospital; general population; people unable to communicate; people undergoing chemotherapy; patient who was well who becomes suddenly unwell | Early identification of infection |  | Not applicable |
| 22 | People with antibiotic resistant bacteria | Bacteriophages | Current standard practice | 1. Treatment of HCAI |
| 23 | People with HCAI | Bacteriophages | Antibiotics | 1. Treatment of HCAI |
| 24 | Tuberculosis transmission in healthcare facilities in UK and in countries with high burden of tuberculosis |  |  | Not applicable |
| 25 | People admitted in hospital | MRSA screening at discharge |  | Not stated |
| 26 | Healthcare professionals | Reduction in decreasing antimicrobial use | Current standard practice | 1. Decrease antibiotic resistance. |
| 27 | Patients with infection | In vitro tests for susceptibility and resistance of multi-drug resistant bacteria |  | Validity |
| 28 | General population | Proton pump inhibitors | No proton pump inhibitors | 1. Risk of becoming colonised with multi-resistant gram negative organisms. 2. Risk of Clostridium difficile infection. |
| 29 | Healthcare professionals | Interventions to bring out behaviour change |  | 1. Adherence to best practice in preventing and controlling infection. |
| 30 | Patients undergoing surgery | Standardised information about post-operative wound care |  | 1. Post-operative infections |
| 31 | Patients with history of recurrent Clostridium difficile infections receiving broad spectrum antibiotics | Prophylactic vancomycin | Current standard practice | 1. Prevention of Clostridium difficile infection |
| 32 | General population | Increase in vancomycin resistant enterococci |  | Not applicable |
| 33 | Hospital administration | Financial penalties and public reporting of HCAI | Current standard practice | 1. Incidence of HCAIs. 2. Behavioural change of healthcare professionals. |
| 34 | Hospital administration | Most effective cleaning agent |  | 1. Multi-drug resistant organisms. |
| 35 | Patients with influenza | Length of time that viral particles remain suspended in the air after coughing and what distance do they travel? |  | Not applicable |
| 36 | Patients admitted to hospital | Optimal staffing levels and experience in hospital infection control unit |  | 1. HCAI. |
| 37 | Patients admitted to hospital | Gowns and gloves |  | 1. HCAI. |
| 38 | Patients admitted to hospital, critically ill patients | Best way of identifying patients at high risk of carrying pathogens of concern |  | Not applicable |
| 39 | Patients at high risk of developing infections | Methods to prevent transmission of pathogens from water |  | 1. Prevention of water borne infection. |
| 40 | General practitioners | Incentives | Current standard practice | 1. Antimicrobial consumption in the community 2. Antibiotic resistant infections in the community 3. Better targeting antimicrobial therapy without compromising care and outcomes at an individual patient level. |
| 41 | Patients undergoing clean surgery without prosthesis | Antibiotics | No antibiotics | 1. Surgical site infection |
| 42 | Patients undergoing upper limb and lower limb surgery (healthy people, smokers, diabetics) | Rate of surgical site infection |  | Not applicable |
| 43 | People requiring antibiotics | Does antibiotic use increase of risk of being colonised with multi-drug resistant organisms (for example, Carbapenem -resistant Enterobacteriaceae/ extended spectrum beta-lactamases) |  | Not applicable |
| 44 | How does CRE (carbapenem-resistant enterococci) spread? | a) shared use of toilets  b) healthcare professionals  c) plumbing d) cleaning supplies |  | Not applicable |
| 45 | Patients with HCAI organisms that persist in biofilms | Methods to eradicate persistence |  | 1. Eradication of HCAI |
| 46 | People with urinary tract infections | Single day antibiotics | Longer course of antibiotics | 1. Eradication of urinary tract infections |
| 47 | Patients admitted to hospital | Eradication of Staphylococcus aureus nasal carriage |  | 1. Decreased Staphylococcus aureus infections |
| 48 | Infants with MRSA infection | Nursing on mother's bare skin | Antibiotics | 1. Eradication of MRSA |
| 49 | Healthcare professionals | Alternatives to performance metrics | Performance metrics | 1. Good practice |
| 50 | Early identification of eradication of infection |  |  | Not applicable |
| 51 | People undergoing knee, hip, back surgery; all orthopaedic operations | Incidence of HCAI, trend in incidence of HCAI, and its impact on quality of life |  | Not applicable |
| 52 | General population; elderly people attending emergency department | Factors associated with HCAI |  | Not applicable |
| 53 | Patients admitted to hospital | Hand-action tap versus wrist-action taps versus foot-activated taps |  | 1. HCAI. 2. Regular testing of devices. |
| 54 | Patients admitted to hospital | Touchscreen computer | Current standard practice | 1. HCAI. |
| 55 | Patients with infection | Different treatment durations |  | 1. Eradication of infection. 2. Development of antibiotic resistance. |
| 56 | Patients with multi resistant Gram-negative bacteria (GNB) | Different antibiotic regimens |  | 1. Eradication of infection. |
| 57 | Patients in critical care with infections | Individualised antimicrobial dosing | Standard dosing | 1. Safety. |
| 58 | Patients in intensive care unit | Gentamicin |  | 1. Nephrotoxicity |
| 59 | Patients admitted to hospital | Screening and isolation | No screening | Not stated |
| 60 | Patients admitted to hospital | How frequently is screening performed prior to admission? |  | Not applicable |
| 61 | Patients admitted to hospital | How frequently are patients followed-up after discharge to determine that their HCAI has been eradicated? |  | Not applicable |
| 62 | Patients admitted to hospital | Antibiotics after culture | Empirical antibiotic therapy | 1. Decreased HCAI. 2. Length of hospital stay. |
| 63 | Healthcare professionals | Antibiotic stewardship policies |  | 1. Antibiotic resistance 2. Harms |
| 64 | Relatives of patients who require antibiotics | Home intravenous therapy | No home intravenous therapy | 1. Antibiotic resistance in patient relatives |
| 65 | General population | Interventions to alter public perception of antibiotics in order to ensure that antibiotics are not sought for conditions for which there is no benefit |  | 1. Public perception. |
| 66 | Patients with suspected bacterial infection | Point-of-care tests to diagnose bacterial infection | Current standard practice | 1. Antibiotic use in primary care. 2. Community antibiotic resistance. |
| 67 | People undergoing peritoneal dialysis | Prophylaxis for peritonitis. |  | 1. Prevention of peritonitis. |
| 68 | People admitted in hospital, people with immunosuppression, elderly people with sickle cell disease especially in those whose mother tongue is not English | Interventions to decrease HCAI |  | 1. Transmission of HCAI. |
| 69 | People at risk of HCAI | Patient education to look for clinical signs | Current standard practice | Not stated |
| 70 | People with HCAI | Proportion of HCAI attributable to poor clinical practice |  | Not applicable |
| 71 | Healthcare professionals | Letters to GP after being admitted in hospital to contain details of bacteria rather than just site of infection | Current standard practice | Not stated |
| 72 | People requiring intravenous antibiotics | Alternate infusion strategies (continuous infusion, extended infusion) | Current standard practice | Not stated |
| 73 | People requiring intravenous antibiotics | Outpatient antibiotic therapy | Inpatient antibiotic therapy | Not stated |
| 74 | Researchers investigating infections | Nanotechnology |  | Better treatments for infection |
| 75 | Elderly patients with a history of infections | Prophylactic long-term treatment | Treatment when required | 1. Number of infections |
| 76 | Patients with HCAI acquired in hospital | Different antibiotic regimens |  | 1. Number of visits to hospital or GP until 6 weeks after discharge |
| 77 | Outpatients and visitors | Interventions to improve awareness to stop visiting when they are unwell or have been recently unwell |  | Not stated |
| 78 | Community | Discharge of patients with HCAI |  | 1. Safety |
| 79 | People undergoing emergency laparotomy | Wound protectors | Current standard practice | 1. Surgical site infection |
| 80 | People with severe acute pancreatitis | Early feeding (within 48 hours of diagnosis) | Current standard practice | 1. Infective complications after acute pancreatitis. |
| 81 | People undergoing orthopaedic operations | Preoperative showering or special body wash | Current standard practice | 1. Surgical site infection |
| 82 | People undergoing orthopaedic operations with suspected surgical site infection | Early scan to diagnose deep-seated infections | Current standard practice | 1. Cost-effectiveness |
| 83 | People undergoing orthopaedic operations with bone infection | Intravenous antibiotic | Oral antibiotic | 1. Eradication of infection |
| 84 | People undergoing orthopaedic operations | Course of preoperative antibiotics | Current standard practice | 1. Surgical site infection |
| 85 | People at risk of HCAI | Routine blood tests to diagnose infection | Current standard practice | Not stated |
| 86 | People with Panton-Valentine leucocidin positive infections | Is it related to specific genetic make-up |  | Not applicable |
| 87 | Patients in critical care | Identification of people at high risk of developing HCAI |  | Not applicable |
| 88 | Patients in critical care | Immune modulator therapy | Current standard practice | 1. Prevent HCAI |
| 89 | Patients in critical care | Role of change in microbiome in pathogenesis of HCAI |  | Not applicable |
| 90 | Patients in critical care | Molecular diagnostics |  | Not applicable |
| 91 | Junior doctors | Educational interventions |  | 1. Improve antimicrobial prescribing. |
| 92 | Elderly people | Interventions to decrease incidence and severity of urinary tract infections |  | 1. Urinary tract infections |
| 93 | Healthcare professionals | Providing feedback to clean their hands |  | 1. Clean their hands |
| 94 | People with MRSA | Best treatments for MRSA |  | 1. Eradication of MRSA |
| 95 | Healthcare professionals from countries where carbapenem-resistant Enterobacteriaceae is endemic | Screening for carbapenem-resistant Enterobacteriaceae |  | Not stated |
| 96 | Policy makers | Revision to the current set of HCAIs to be reported | Existing list of organisms to be reported | Not stated |
| 97 | Healthcare professionals | Hand gel | Handwashing | 1. Prevent HCAI |
| 98 | Healthcare professionals | E-learning | Current standard practice | 1. Keeping up-to-date with infection prevention and control training. 2. Ensuring that hand hygiene, aseptic techniques, practical techniques such as gloving are of the right standard. |
| 99 | General population | Education | Current standard practice | 1. HCAI. 2. Antimicrobial resistance. 3. Fewer prescriptions of antibiotics. |
| 100 | People at risk of developing infections | Prophylaxis with antibiotics |  | 1. Antimicrobial prescription. |
| 101 | Spread of pseudomonas from sinks |  |  | Not applicable |
| 102 | Neonates in NICU | Methods to prevent transmission of pseudomonas |  | 1. Prevention of pseudomonas infection |
| 103 | Pharmacists | Diversity in antimicrobial prescribing | Current standard practice | 1. Reduce antimicrobial resistance |
| 104 | People at risk of developing pneumonia (particularly those undergoing surgery and requiring ventilator) | Vaccination | Current standard practice | 1. Pneumonia |
| 105 | Patients with infections | One-to-one nursing | Current standard practice | Not stated |
| 106 | Nurses looking after patients with Clostridium difficile/Norovirus | How often do nurses wash hands |  | Not applicable |
| 107 | Neurosurgeons | Hand hygiene compliance |  | 1. Appropriate personal protection equipment. 2. Washing hands before and after patient contact. 3. Use of aseptic non-touch technique. |
| 108 | People eating food exposed to the environment | Infection |  | Not applicable |
| 109 | People with HIV, tuberculosis | Risk to other patients |  | Not applicable |
| 110 | Are shoes of healthcare professionals a source of infection |  |  | Not applicable |
| 111 | What are the bacteria on top of the sanitisers? |  |  | Not applicable |
| 112 | Are blood pressure cuffs and pulse oximeters cleaned between patients |  |  | Not applicable |
| 113 | What is the risk of infection by patients using the shower rooms used by infected patients |  |  | Not applicable |
| 114 | People who require dressings | Dedicated dressing rooms | Current standard practice | 1. Infection rates. 2. Efficiency. |
| 115 | People with tracheostomy | Best way of cleaning the inner tubes |  | 1. Pseudomonas infection |
| 116 | People admitted in hospital | Early discharge | Current standard practice | 1. Infection rates. |
| 117 | People requiring peripherally inserted central catheter (PICC) | Alcohol lock of lines | Normal saline lock of lines | 1. Percentage of line removals. |
| 118 | People receiving immunosuppressants | Types of infections in people receiving different type of immunosuppressants and how they affect different pre-existing conditions such as gallstones and latent infections |  | Not applicable |
| 119 | Healthcare professionals | Barriers to compliance to infection prevention and control policies |  | Not applicable |
| 120 | Healthcare professionals | Signage | No signage | 1. Compliance to infection prevention and control policies. |
| 121 | People undergoing surgery | Long-term urinary catheters versus short-term urinary catheters versus no urinary catheters; optimal duration of urinary catheters |  | 1. Urinary tract infections |
| 122 | Healthcare professionals | Restriction of nail varnish | No restriction of nail varnish | 1. Not stated, but implies infection control |
| 123 | Healthcare professionals | Methods to increase listening to patients concerns about infection |  | 1. Patient satisfaction |
| 124 | Patients with neutropenia | Isolated waiting rooms | Current standard practice | 1. Infection |
| 125 | General people, Healthcare professionals | Barriers to flu vaccination, attitude towards mandatory annual flu vaccination |  | 1. Flu rates. 2. Vaccination uptake |
| 126 | Nurses | Wash uniforms daily and change to uniforms at work | Current standard practice | 1. Infections. |
| 127 | Hospital administration | Separate rooms for shower and toilet | Same room for shower and toilet | 1. Infections. |
| 128 | Neurology patients with suspected infection | Testing for infection | No testing for infection | Not stated |
| 129 | Patients requiring intravenous lines | Intravenous lines kept connected for 72 hours | Frequent connection and disconnection of intravenous lines | 1. Intravenous line associated infections |
| 130 | Patients undergoing surgery | Vancomycin powder topical application | Current standard practice | 1. Surgical site infection |
| 131 | Healthcare professionals | Bare below the elbow | No 'bare below the elbow' | 1. Infection |
| 132 | Hospital administration | Mixed speciality wards with different risks of infection | Single speciality wards | 1. Infection |
| 133 | Patients with urinary tract infections | Optimal treatment of urinary tract infection |  | 1. Cure of urinary tract infection. |
| 134 | Patients with urinary tract infections | Occupations at high risk of urinary tract infection |  | Not applicable |
| 135 | Patients admitted in hospital | Risk posed by visitors in spreading infection |  | 1. All infection. 2. Norovirus. 3. Flu. |
| 136 | Patients with penile cancer | Association between penile cancer and infections |  | Not applicable |
| 137 | Healthcare professionals in surgical wards | Aseptic methods (non-touch technique) | Non aseptic techniques (non-touch) | 1. Infection |
| 138 | Patients staying in hospital for a long time | Open windows in wards | Closed window in wards | 1. Chest infection |
| 139 | Patients with HCAI discharged from hospital | Ease of access to hospital services (for example, email, phone calls) | Current standard practice | Not stated |
| 140 | Patients admitted in hospital | Antibacterial wipes to clean patient's tables | Current standard practice | 1. Infection |
| 141 | Patients admitted in hospital | Using commode on the bedside | Not using commode on the bedside | 1. Infection |
| 142 | Patients admitted in hospital | Better communication system (Vocera) | Current standard practice | 1. Time from empirical therapy to targeted antibiotic therapy in patients with HCAI |
| 143 | Patients admitted in hospital | Routine single room | Current standard practice | 1. HCAI. 2. Rates of norovirus, influenza, parainfluenza, rotavirus, and Clostridium difficile. |
| 144 | Patients admitted in hospital | Rapid point of care testing | Current standard practice | 1. HCAI. 2. Length of hospital stay. 3. Mortality. |
| 145 | Patients admitted in hospital | Better cleaning of beds during patients hospital stay, especially after operation | Current standard practice | 1. Reinfection. |
| 146 | Safety of water poured into cups from jugs at different time intervals, water jugs used in the wards |  |  | 1. Water testing for infective organisms at different time intervals. 2. Infection (particularly urinary tract infection). |
| 147 | Patients admitted in hospital | Better cleaning of bathrooms, toilets, and additional cleaning products for patients as required |  | 1. Infection. 2. Type of infection - is this related to organisms found in bathrooms and toilets |
| 148 | Patients admitted in hospitals, visitors using toilets and bathrooms | Screening for MRSA |  | 1. Infection. |
| 149 | Patients with breast implant | Identification of infection without surgery |  | Not applicable |
| 150 | Patients receiving chemotherapy | Better way of mixing with others without increasing the risk of infection |  | Not applicable |
| 151 | Non-compliant patients including drug users and drunks | Best way of infection control |  | 1. Infection control. |
| 152 | People with differing immunity | Likelihood of HCAI in people with differing immunity |  | Not applicable |
| 153 | People with differing immunity | Lifestyle factors that affect immunity |  | Not applicable |
| 154 | Patients admitted in hospital | Cleaning of patient-areas between the patients |  | 1. Infection. |
| 155 | Patients admitted in hospital | Weekly cleaning of all equipment in a bay and proper cleaning of walls and floors |  | 1. Infection. |
| 156 | Healthcare professionals | Interventions to improve compliance of healthcare professionals to wear gloves and aprons |  | 1. Infection. |
| 157 | Elderly people admitted to hospital | Interventions to prevent chest infections |  | 1. Chest infection |
| 158 | Registered nurse workforce | Unregistered nurse workforce |  | 1. Surgical site infection |
| 159 | Different types of patients (haematological versus surgical) |  |  | 1. Adverse events. |
| 160 | Patients admitted in hospital, neutropenic patients admitted in hospital | Aprons and gloves | No aprons and gloves | 1. Infection. |
| 161 | Patients admitted in hospital | Better patient information about reason for tests | Standard care | 1. Patient satisfaction |
| 162 | Patients attending pre-assessment clinic | Better patient information | Standard care | 1. Patient anxiety. |
| 163 | Patients with cancer and HCAI | Interventions to improve doctor and nurse communication | Standard care | 1. Hospital stay. |
| 164 | Patients requiring intravenous drugs | Slip-lock | Luer-lock | 1. Infection. 2. Costs. |
| 165 | Patients admitted in hospital | Better planning of bathrooms (including sinks) | Standard planning | 1. Infection. |
| 166 | Patients admitted in hospital | Shared toilets | Separate toilets | 1. Infection.  2. Bacteriological swabs. |
| 167 | Does laundering and storing of patients and gowns pose a infection risk |  |  | Not applicable |
| 168 | Patients admitted in hospital | Greater distance between beds | Current distance between beds | 1. Infection. 2. Influenza. |
| 169 | Interventions to improve cleanliness in bathrooms and toilets |  |  | 1. Infection. 2. Bacteriological samples. |
| 170 | Patients and visitors | Methods to improve hand hygiene /overall hygiene |  | 1. Hand hygiene compliance. 2. Hygiene |
| 171 | Is air-conditioning a source of infection does infection transfer from one ward to another through air-conditioning? |  |  | 1. Infection |
| 172 | Is floor a source of infection? |  |  | 1. Swabbing and lab testing. |
| 173 | Hospital administration | Nurse-led cleaning of beds | Cleaners-led cleaning of beds | 1. Bacteriological swab. |
| 174 | Patients admitted in hospital | Comparison of toilet-tissue dispensers |  | 1. Infection. 2. Bacteriological samples. |
| 175 | Patients undergoing neurological surgery | Timing of washing before a head wound can be washed. |  | 1. Infection. 2. Wound breakdown. |
| 176 | Patients admitted in hospital | Effectiveness of alcohol gel |  | 1. Infection. |
| 177 | Patients admitted in hospital with open wounds following surgery | Empowering patients to challenge staff |  | 1. Infection. |
| 178 | Patients with wounds in the head | Interval between dressing changes |  | 1. Infection. |
| 179 | Healthcare professionals | Staff education | Standard care | 1. Infection. |
| 180 | Nurses | Wearing uniforms outside the hospital | Not wearing uniforms outside the hospital. | 1. Infection. |
| 181 | Patients with healthcare associated infections. | Disrupted sleep. | Normal sleep. | 1. Recovery from infection. 2. Length of hospital stay. |
| 182 | Healthcare professionals | Emphasising aseptic techniques | Standard care | 1. Change in behaviour. |
| 183 | Hospital administration | Overheated wards | Wards in the correct temperature | 1. Spread of infection. |
| 184 | People with chronic rhinosinusitis | Role of infection in rhinosinusitis |  | Not applicable |
| 185 | Patients undergoing surgery | Stable theatre temperature | Unstable theatre temperature | 1. Infection |
| 186 | Patients undergoing surgery | Rapid screening of MRSA |  | 1. Avoid cancellations due to MRSA. |
| 187 | Patients admitted in hospital | Walking barefoot | Walking with slippers | 1. Infection. 2. Feet swab for bacteria. |
| 188 | Patients admitted in hospital | Risk due to curtains and other things |  | 1. Infection. 2. Feet swab for bacteria. |
| 189 | Healthcare professionals | Indoor footwear in hospital | Standard outdoor footwear in hospital | 1. Infection. |
| 190 | Patients admitted in hospital | Shared cups and beakers | Non-shared cups and beakers | 1. Infection. |
| 191 | Patients admitted in hospital | Impact of one patient's hygiene on HCAI in other patients |  | 1. Infection. 2. Feet swab for bacteria. |
| 192 | Patients admitted in hospital | Plastic cups and beakers | Glass cups and beakers | 1. Bacteriological swab. |
| 193 | Patients admitted in hospital | Role of visitors in spread of infection |  | 1. Infection. |
| 194 | Health-care professionals | Nail varnish | No nail varnish | 1. Infection. |
| 195 | Health-care professionals | Impact of staff working when ill on infection |  | 1. Infection. |
| 196 | Patients admitted in hospital | Which group are prone to pseudomonas |  | 1. Pseudomonas infection |
| 197 | Patients with pseudomonas infection | Best treatments for pseudomonas |  | 1. Effective (no further details) |
| 198 | Patients with plates inserted during orthognathic procedures | Effect of smoking |  | 1. Infection |
| 199 | Patients admitted in hospital | Sensor operated taps, toilet lids, and door opening | Standard taps, toilet lids, and doors | 1. Infection |
| 200 | Patients admitted in hospital | Separate toilet roll for each patient | Shared toilet roll for each patient | 1. Infection |
| 201 | Patients admitted in hospital | Use of overshoes | Current standard practice | 1. Infection |
| 202 | Healthcare professionals with needlestick injury | Ethical implications of obtaining consent |  | 1. Psychological effect on donor and person who underwent needlestick injury. |
| 203 | Health-care professionals | Soap and water + gloves | Alcohol gel + gloves | 1. Infection |
| 204 | Patients admitted in hospital | Hot air versus paper towels versus textile towels |  | 1. Infection |
| 205 | Patients admitted in hospital | Information posters and hand-cleaning products |  | 1. Diarrhoea and vomiting. |
| 206 | Patients and visitors | Level of hand hygiene |  | 1. Hand hygiene. 2. Infection |
| 207 | Patients requiring urinary catheters | Improvement in design |  | Not applicable |
| 208 | Patients at risk of developing HCAI | Role of air travel |  | 1. Infection |
| 209 | Health-care professionals | Prevention of handshake | Standard care | 1. Infection |
| 210 | Patients admitted in hospital | UV light |  | 1. Infection |
| 211 | Health-care professionals | Methods to improve awareness of sepsis |  | 1. Awareness |
| 212 | Patients admitted in hospital | Role of dust in the environment |  | 1. Infection |
| 213 | Patients admitted in hospital | Cleaning dust, dusty equipment | Standard care | 1. Infection |
| 214 | Patients admitted in hospital | Steaming | Standard care | 1. Infection |
| 215 | Patients with Clostridium difficile infection with Tox- | Risk factors for conversion from tox - to tox + status |  | Not applicable |
| 216 | Patients with Clostridium difficile infection with Tox- | Methods to prevent conversion from tox - to tox + status |  | 1. Mortality 2. Tox + status. |
| 217 | Health-care professionals | Is ward keys a source of HCAI |  | 1. Bacteriological swab. |
| 218 | Health-care professionals, patients, and carers handling central lines | Optimum method and frequency of training and assessment |  | 1. Central line infections. |
| 219 | Health-care professionals | Level of staffing |  | 1. Infection. 2. Time to discharge. 3. Patient experience. |
| 220 | People requiring admission into hospital | Screening for MRSA | No screening | 1. MRSA infection. |
| 221 | People requiring admission into hospital | Screening for tuberculosis | No screening | 1. Tuberculosis infection. |
| 222 | People admitted in hospital | Association between chest infections and diarrhoeal infections and air quality |  | 1. Chest infection. 2. Diarrhoeal infections. |
| 223 | People with drug-resistant coliforms in gut | Long-term carriage |  | 1. Faster recovery. 2. Quality of life. |
| 224 | Health-care professionals | Prevalence of diarrhoea and vomiting |  | 1. Prevalence |
| 225 | Health-care professionals | Compliance of personal protection equipment and hand-washing |  | Not applicable |
| 226 | People visiting GP | Point-of-care C-reactive protein to diagnose bacterial infection | Standard antibiotic prescription | 1. Levels of antibiotic prescription. 2. Antibiotic resistance. 3. Hospital admission due to community-acquired pneumonia. |
| 227 | Researchers | Are new antibiotics being developed for people with carbapenem-resistant organisms? |  | Not applicable |
| 228 | People with carbapenem-resistant organisms | What is the risk of further mutation? |  | Not applicable |
| 229 | Invalid as no signature | Invalid as no signature | Invalid as no signature | Invalid as no signature |
| 230 | Hospital administration | Single room hospitals | Ward based hospitals | 1. Infection |
| 231 | Patients admitted in hospital | Risk of infection due to commonly touched areas such as sanitizer bottles |  | 1. Infection |
| 232 | Patients admitted in hospital | Visitor restriction | No visitor restriction | 1. Infection |
| 233 | Patients admitted in hospital | No gloves other than dealing with bloods | Gloves for all interactions with patients | 1. Infection |
| 234 | Health-care professionals | Infection risk due to staff wearing uniforms to canteen |  | 1. Infection |
| 235 | Hospital administration | Impact of lack of finance on infection |  | 1. Infection |
| 236 | Researchers | How to tackle decreased effectiveness of antibiotics |  | Not applicable |
| 237 | People with drainage or seromas after surgery | Early discharge from hospital | Standard discharge from hospital | 1. Infection |
| 238 | Health-care professionals | Infection risk to patients due to staff uniform |  | 1. Staff uniform before and after shift |
| 239 | Patients visiting A&E | Isolated rooms | Standard care | 1. Infection |
| 240 | Patients visiting A&E | Cohort nursing | Standard nursing | 1. Infection |
| 241 | Patients admitted to hospital | Hourly cleaning of bathrooms and communal areas | Standard frequency of cleaning of bathrooms and communal areas | 1. Infection |
| 242 | Visitors | Screening for infection |  | 1. Infection |
| 243 | General population | Effectiveness of cleaners |  | 1. MRSA infection. |
| 244 | Patients admitted to hospital | Are cleaning equipment and mops a source of infection? |  | 1. Infection |
| 245 | Patients admitted to hospital | What training is giving to hospital cleaners. |  | 1. Infection |
| 246 | Patients admitted to hospital | Best way to monitor cleaning in hospitals |  | 1. Bacteriological swab before and after cleaning. |
| 247 | Patients admitted to hospital | Risk due to dirty/unmonitored bathrooms and toilets |  | 1. Infection |
| 248 | Health-care professionals | Methods to increase adherence to 'infection and control policy' |  | 1. Adherence to 'infection and control policy' |
| 249 | Patients admitted to hospital | Methods to control risk of infection due to air-conditioning |  | 1. Infection |
| 250 | Patients admitted to hospital and who want to smoke | Designated area for smoking in hospital | Current standard practice (going out of hospital to smoke) | 1. Infection |
| 251 | Patients admitted to hospital and who want to smoke | Impact of rapid turn-over of patients on infection |  | 1. Infection |
| 252 | Hospital administration | Impact of building more hospitals on infection |  | 1. Infection |
| 253 | Patients admitted to hospital | Association between hospital infection control policies and resistant gram-negative organisms (such as ESBL) |  | Not applicable |
| 254 | Patients with neutropenia | Isolated rooms | Current standard practice | 1. Infection |
| 255 | Health-care professionals dealing with central venous catheter | Routine face-masks | No face masks | 1. Infection |
| 256 | Health-care professionals working on wards with neutropenic patients | Separate medical trolleys for each patient | Current standard care (medical tray placed on patient's beds or pillows). | 1. Infection |
| 257 | Patients with leg ulcers | Outpatient care | Inpatient care | 1. Infection |
| 258 | Patients with leg ulcers admitted in hospital | Isolated rooms | Standard care | 1. Infection |
| 259 | Patients with neutropenia | Providing refrigerator in their room | Standard care | 1. Infection |

## **Appendix 2.** Interim list of 50 uncertainties

1. What is the role of change of bacteria in patients or the environment in the development of infection in hospital?

2. How can we change the behaviour of healthcare professionals to follow best practices in preventing and controlling HCAI?

3. What are the alternatives to single room isolation of people with antibiotic resistant bacteria so that the care of such people can be improved?

4. How can we improve the resources available to healthcare professionals , volunteers, and cleaners and improve their knowledge and training for better identification, prevention, and treatment of HCAI?

5. Are single-day antibiotics better than longer course of antibiotics in treating urinary tract infection?

6. What is the best antibiotic treatment for urinary tract infection?

7. In people with antibiotic resistant bacteria, what is the impact of single room isolation compared with open-ward care in the overall care and mental health of the person with antibiotic resistance and in preventing transmission of infections to others?

8. How can we alter the public perception of antibiotics in order to ensure that antibiotics are not sought for conditions for which there is no benefit?

9. Should the requirement for urinary catheters be periodically reviewed in people with long-term urinary catheter?

10. Can point-of-care bacterial testing (bedside bacterial testing) decrease the antibiotic use in primary care and decrease community antibiotic resistance?

11. How can infections be identified early?

12. How can the development and severity of urinary tract infections in elderly be decreased?

13. How does direct-contact warming compare with forced air warming in the prevention of surgical site infections in people who undergo surgery for more than 90 minutes?

14. How can working in partnership with patients help researchers develop methods of increasing compliance with hand hygiene in hospitals?

15. How can chest infections be prevented in elderly people admitted to hospital?

16. Do use of gowns and gloves routinely for everyone prevent the development of HCAI in people admitted to hospital?

17. How can we improve the awareness of health-care professionals about sepsis?

18. Can nanotechnology (that is working with very small particles) result in better treatments for infection?

19. How does individualised antimicrobial dosing compare with standard dosing regimen in patients admitted in intensive care unit with infections?

20. Can antibiotic stewardship policies decrease antibiotic resistance, and do they cause any harm to the patients?

21. How can we prevent Clostridium difficile from producing toxin and does this reduce deaths?

22. Does discharging patients early from hospital decrease HCAI?

23. Can rapid point-of-care testing (bedside testing) for infections at the time of hospital admission decrease HCAI, length of hospital stay, and deaths in people requiring hospital admission?

24. How can we improve the antimicrobial prescription by junior doctors?

25. Is screening and isolation of patients with antibiotic resistant bacteria effective (in decreasing transmission of infections and deaths)?

26. What is the most effective cleaning agent to prevent multi-drug resistant organisms?

27. What is the risk of becoming colonised with multi-resistant gram negative organisms and Clostridium difficile infection in general public taking proton pump inhibitors?

28. Is outpatient antibiotic therapy better than inpatient antibiotic therapy in people requiring intravenous antibiotics?

29. Does keeping intravenous lines connected for 72 hours decrease HCAI compared to frequent connection and disconnection of intravenous lines in patients with intravenous lines?

30. Should people at risk of developing HCAI undergo blood tests routinely?

31. Are bacteriophages better than antibiotics in people with antibiotic resistant bacteria?

32. How valid are in vitro tests (laboratory tests) in testing whether an antibiotic will work in people with multi-drug resistant bacteria?

33. How does hot air compare with paper towels and textile towels in preventing HCAI?

34. Does CRE (carbapenem-resistant enterococci) spread through shared use of toilets, healthcare professionals, plumbing, or cleaning supplies?

35. Does antibiotic prescription based on point-of-care (bedside) C-reactive protein to diagnose bacterial infection decrease amount of antibiotic prescription, antibiotic resistance, and hospital admission due to community-acquired pneumonia?

36. What is the risk posed to the patients admitted in hospital by visitors in spreading all infections including Norovirus and flu?

37. How can we educate patients to look for clinical signs of HCAI?

38. What are the optimal staffing levels and experience in hospital infection control unit to prevent HCAI?

39. How can we stop nurses from reusing antimicrobial wipes?

40. Does better cleaning of bathrooms, toilets, and additional cleaning products for patients as required decrease HCAI?

41. How effective is alcohol gel in preventing HCAI?

42. Does infection prevention and control training of patients and carers help in the prevention of infection in vulnerable patients being cared for in their own homes?

43. Do sensor operated taps, toilet lids, and door opening in hospitals prevent HCAI?

44. Does decreasing antimicrobial use by health professionals decrease antibiotic resistance?

45. What is the best antibiotic treatment for patients with ventilator-associated pneumonia?

46. Does cleaning of patient-areas between the patients prevent HCAI?

47. How can we improve compliance of healthcare professionals to wear gloves and aprons in order to prevent HCAI?

48. How does outpatient care compare with inpatient care in patients with leg ulcers?

49. How often do nurses looking after patients with Clostridium difficile or Norovirus wash hands?

50. How can we improve general hygiene and hand hygiene in hospital visitors?

**Appendix 3.** List of 32 uncertainties discussed in the final workshop

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Question number | Question | Number of times identified in the top 10 | Do recent systematic reviews exist? | If available, what was their conclusion? | Comments |
| 1 | How can we alter the public perception of antibiotics in order to ensure that antibiotics are not sought for conditions for which there is no benefit? | 23 | No | Not applicable |  |
| 2 | Can rapid point-of-care testing (bedside testing) for infections at the time of hospital admission decrease HCAI, length of hospital stay, and deaths in people requiring hospital admission? | 21 | No | Not applicable |  |
| 3 | Can point-of-care bacterial testing (bedside bacterial testing) decrease the antibiotic use in primary care and decrease community antibiotic resistance? | 17 | No | Not applicable |  |
| 4 | How can we improve general hygiene and hand hygiene in hospital visitors? | 16 | No | Not applicable |  |
| 5 | How can we improve the resources available to healthcare professionals , volunteers, and cleaners and improve their knowledge and training for better identification, prevention, and treatment of HCAI? | 15 | No | Not applicable |  |
| 6 | How can chest infections be prevented in elderly people admitted to hospital? | 15 | No | Not applicable |  |
| 7 | How can we change the behaviour of healthcare professionals to follow best practices in preventing and controlling HCAI? | 13 | No | Not applicable |  |
| 8 | Are single-day antibiotics better than longer course of antibiotics in treating urinary tract infection? | 13 | (1) | This is a high risk of bias systematic review and the conclusions are unreliable |  |
| 9 | How can infections be identified early? | 13 | (2) | Multiplex polymerase chain reaction (mPCR)s may provide useful diagnostic information for early identification of respiratory virus infections | This covers only respiratory virus infection. |
| 10 | Are bacteriophages better than antibiotics in people with antibiotic resistant bacteria? | 13 | No | Not applicable |  |
| 11 | In people with antibiotic resistant bacteria, what is the impact of single room isolation compared with open-ward care in the overall care and mental health of the person with antibiotic resistance and in preventing transmission of infections to others? | 12 | No | Not applicable |  |
| 12 | Can antibiotic stewardship policies decrease antibiotic resistance, and do they cause any harm to the patients? | 12 | (3-7) | (3-5): More studies of appropriate study designs are necessary (6): Antimicrobial stewardship is effective (7): Antibiotic stewardship interventions probably reduces length of stay by one day (moderate-certainty evidence), but may lead to delay in treatment and negative professional culture because of breakdown in communication and trust between infection specialists and clinical teams (low-certainty evidence). | (6): Ignores the risk of bias in the studies  (7): The other conclusions about antibiotic stewardship do not seem to fit in with the findings |
| 13 | How can the development and severity of urinary tract infections in elderly be decreased? | 11 | No | Not applicable |  |
| 14 | How does individualised antimicrobial dosing compare with standard dosing regimen in patients admitted in intensive care unit with infections? | 11 | No | Not applicable |  |
| 15 | How can we educate patients to look for clinical signs of HCAI? | 11 | No | Not applicable |  |
| 16 | What is the most effective cleaning agent to prevent multi-drug resistant organisms? | 10 | No | Not applicable |  |
| 17 | What is the risk posed to the patients admitted in hospital by visitors in spreading all infections including Norovirus and flu? | 10 | No | Not applicable |  |
| 18 | Does infection prevention and control training of patients and carers help in the prevention of infection in vulnerable patients being cared for in their own homes? | 10 | No | Not applicable |  |
| 19 | What are the alternatives to single room isolation of people with antibiotic resistant bacteria so that the care of such people can be improved? | 9 | No | Not applicable |  |
| 20 | Is screening and isolation of patients with antibiotic resistant bacteria effective (in decreasing transmission of infections and deaths)? | 9 | No | Not applicable |  |
| 21 | How effective is alcohol gel in preventing HCAI? | 9 | No | Not applicable |  |
| 22 | Does decreasing antimicrobial use by health professionals decrease antibiotic resistance? | 9 | No | Not applicable | Related question: antibiotic stewardship policies, but not necessarily decreased antimicrobial use |
| 23 | What is the role of change of bacteria in patients or the environment in the development of infection in hospital? | 8 | (8, 9) | (8): Better quality studies are necessary (9): Surgeons should consider the use of synbiotics as an adjunctive therapy to prevent post-operative complications among adult surgical patients. | Only in the post-operative setting  (9): high risk of bias systematic review; so, conclusions are misleading |
| 24 | What is the best antibiotic treatment for urinary tract infection? | 8 | (1) | Single-dose aminoglycoside therapy appears to be an effective treatment option for lower UTI in non-septic patients, with minimal toxicity. Additional studies would be beneficial to confirm efficacy for pyelonephritis. | Only about duration of aminoglycoside therapy  This is a high risk of bias systematic review and the conclusions are unreliable |
| 25 | How can we improve the awareness of health-care professionals about sepsis? | 8 | No | Not applicable |  |
| 26 | Does keeping intravenous lines connected for 72 hours decrease HCAI compared to frequent connection and disconnection of intravenous lines in patients with intravenous lines? | 8 | No | Not applicable |  |
| 27 | Do sensor operated taps, toilet lids, and door opening in hospitals prevent HCAI? | 8 | No | Not applicable |  |
| 28 | Should the requirement for urinary catheters be periodically reviewed in people with long-term urinary catheter? | 7 | No | Not applicable |  |
| 29 | Can nanotechnology (that is working with very small particles) result in better treatments for infection? | 7 | No | Not applicable |  |
| 30 | How can we improve the antimicrobial prescription by junior doctors? | 7 | No | Not applicable | Antibiotic stewardship by doctors covered, but not specific to junior doctors |
| 31 | Is outpatient antibiotic therapy better than inpatient antibiotic therapy in people requiring intravenous antibiotics? | 7 | No | Not applicable |  |
| 32 | Does antibiotic prescription based on point-of-care (bedside) C-reactive protein to diagnose bacterial infection decrease amount of antibiotic prescription, antibiotic resistance, and hospital admission due to community-acquired pneumonia? | 7 | (10) | More studies are necessary | Only in children |

# **Appendix 4.** Results of first small group discussions

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Question ID** | **Question** | **Facilitator A** | **Facilitator B** | **Facilitator C** | **Combined score**  **(lower score indicates higher priority)** |
| M | How can infections be identified early? | 1 | 1 | 1 | 3 |
| K | How can we change the behaviour of healthcare professionals to follow best practices in preventing and controlling HCAI? | 7 | 4 | 3 | 14 |
| V | Can rapid point-of-care testing (bedside testing) for infections at the time of hospital admission decrease HCAI, length of hospital stay, and deaths in people requiring hospital admission? | 2 | 5 | 12 | 19 |
| BB | Can point-of-care bacterial testing (bedside bacterial testing) decrease the antibiotic use in primary care and decrease community antibiotic resistance? | 3 | 6 | 11 | 20 |
| G | What is the most effective cleaning agent to prevent multi-drug resistant organisms? | 15 | 2 | 6 | 23 |
| FF | How can we educate patients to look for clinical signs of HCAI? | 18 | 9 | 4 | 31 |
| R | Can antibiotic stewardship policies decrease antibiotic resistance, and do they cause any harm to the patients? | 9 | 24 | 2 | 35 |
| DD | Does decreasing antimicrobial use by health professionals decrease antibiotic resistance? | 10 | 10 | 15 | 35 |
| A | What is the role of change of bacteria in patients or the environment in the development of infection in hospital? | 5 | 22 | 9 | 36 |
| Z | In people with antibiotic resistant bacteria, what is the impact of single room isolation compared with open-ward care in the overall care and mental health of the person with antibiotic resistance and in preventing transmission of infections to others? | 17 | 16 | 5 | 38 |
| L | How can we alter the public perception of antibiotics in order to ensure that antibiotics are not sought for conditions for which there is no benefit? | 11 | 19 | 10 | 40 |
| O | Does infection prevention and control training of patients and carers help in the prevention of infection in vulnerable patients being cared for in their own homes? | 20 | 13 | 7 | 40 |
| AA | How effective is alcohol gel in preventing HCAI? | 16 | 7 | 18 | 41 |
| B | How does individualised antimicrobial dosing compare with standard dosing regimen in patients admitted in intensive care unit with infections? | 23 | 3 | 16 | 42 |
| P | How can the development and severity of urinary tract infections in elderly be decreased? | 4 | 12 | 26 | 42 |
| N | Is screening and isolation of patients with antibiotic resistant bacteria effective (in decreasing transmission of infections and deaths)? | 14 | 11 | 23 | 48 |
| I | How can we improve general hygiene and hand hygiene in hospital visitors? | 22 | 8 | 19 | 49 |
| J | Is outpatient antibiotic therapy better than inpatient antibiotic therapy in people requiring intravenous antibiotics? | 8 | 15 | 31 | 54 |
| F | Does antibiotic prescription based on point-of-care (bedside) C-reactive protein to diagnose bacterial infection decrease amount of antibiotic prescription, antibiotic resistance, and hospital admission due to community-acquired pneumonia? | 25 | 18 | 13 | 56 |
| EE | Can nanotechnology (that is working with very small particles) result in better treatments for infection? | 27 | 26 | 8 | 61 |
| T | Does keeping intravenous lines connected for 72 hours decrease HCAI compared to frequent connection and disconnection of intravenous lines in patients with intravenous lines? | 19 | 14 | 30 | 63 |
| X | How can chest infections be prevented in elderly people admitted to hospital? | 6 | 31 | 27 | 64 |
| U | How can we improve the resources available to healthcare professionals , volunteers, and cleaners and improve their knowledge and training for better identification, prevention, and treatment of HCAI? | 24 | 20 | 21 | 65 |
| H | How can we improve the antimicrobial prescription by junior doctors? | 28 | 25 | 14 | 67 |
| Q | What are the alternatives to single room isolation of people with antibiotic resistant bacteria so that the care of such people can be improved? | 13 | 32 | 22 | 67 |
| W | Do sensor operated taps, toilet lids, and door opening in hospitals prevent HCAI? | 29 | 21 | 17 | 67 |
| E | Are single-day antibiotics better than longer course of antibiotics in treating urinary tract infection? | 12 | 28 | 28 | 68 |
| CC | What is the risk posed to the patients admitted in hospital by visitors in spreading all infections including Norovirus and flu? | 26 | 17 | 29 | 72 |
| Y | How can we improve the awareness of health-care professionals about sepsis? | 31 | 23 | 20 | 74 |
| C | Should the requirement for urinary catheters be periodically reviewed in people with long-term urinary catheter? | 21 | 30 | 24 | 75 |
| D | What is the best antibiotic treatment for urinary tract infection? | 30 | 27 | 25 | 82 |
| S | Are bacteriophages better than antibiotics in people with antibiotic resistant bacteria? | 32 | 29 | 32 | 93 |

# **Appendix 5.** Results of first small group discussions

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Question ID** | **Question** | **Facilitator A** | **Facilitator B** | **Facilitator C** | **Combined score**  **(lower score indicates higher priority)** |
| M | How can infections be identified early? | 1 | 1 | 1 | 3 |
| K | How can we change the behaviour of healthcare professionals to follow best practices in preventing and controlling HCAI? | 2 | 2 | 2 | 6 |
| V | Can rapid point-of-care testing (bedside testing) for infections at the time of hospital admission decrease HCAI, length of hospital stay, and deaths in people requiring hospital admission? | 3 | 3 | 3 | 9 |
| BB | Can point-of-care bacterial testing (bedside bacterial testing) decrease the antibiotic use in primary care and decrease community antibiotic resistance? | 4 | 4 | 4 | 12 |
| G | What is the most effective cleaning agent to prevent multi-drug resistant organisms? | 5 | 5 | 5 | 15 |
| R | Can antibiotic stewardship policies decrease antibiotic resistance, and do they cause any harm to the patients? | 7 | 7 | 7 | 21 |
| FF | How can we educate patients to look for clinical signs of HCAI? | 11 | 6 | 6 | 23 |
| DD | Does decreasing antimicrobial use by health professionals decrease antibiotic resistance? | 8 | 8 | 8 | 24 |
| A | What is the role of change of bacteria in patients or the environment in the development of infection in hospital? | 9 | 9 | 9 | 27 |
| Z | In people with antibiotic resistant bacteria, what is the impact of single room isolation compared with open-ward care in the overall care and mental health of the person with antibiotic resistance and in preventing transmission of infections to others? | 6 | 16 | 10 | 32 |
| O | Does infection prevention and control training of patients and carers help in the prevention of infection in vulnerable patients being cared for in their own homes? | 13 | 11 | 11 | 35 |
| P | How can the development and severity of urinary tract infections in elderly be decreased? | 10 | 12 | 13 | 35 |
| L | How can we alter the public perception of antibiotics in order to ensure that antibiotics are not sought for conditions for which there is no benefit? | 12 | 13 | 15 | 40 |
| B | How does individualised antimicrobial dosing compare with standard dosing regimen in patients admitted in intensive care unit with infections? | 15 | 15 | 12 | 42 |
| N | Is screening and isolation of patients with antibiotic resistant bacteria effective (in decreasing transmission of infections and deaths)? | 16 | 10 | 16 | 42 |
| AA | How effective is alcohol gel in preventing HCAI? | 14 | 14 | 19 | 47 |
| I | How can we improve general hygiene and hand hygiene in hospital visitors? | 17 | 17 | 20 | 54 |
| J | Is outpatient antibiotic therapy better than inpatient antibiotic therapy in people requiring intravenous antibiotics? | 18 | 18 | 18 | 54 |
| EE | Can nanotechnology (that is working with very small particles) result in better treatments for infection? | 20 | 20 | 17 | 57 |
| X | How can chest infections be prevented in elderly people admitted to hospital? | 22 | 22 | 14 | 58 |
| F | Does antibiotic prescription based on point-of-care (bedside) C-reactive protein to diagnose bacterial infection decrease amount of antibiotic prescription, antibiotic resistance, and hospital admission due to community-acquired pneumonia? | 19 | 19 | 21 | 59 |
| T | Does keeping intravenous lines connected for 72 hours decrease HCAI compared to frequent connection and disconnection of intravenous lines in patients with intravenous lines? | 21 | 21 | 22 | 64 |
| U | How can we improve the resources available to healthcare professionals , volunteers, and cleaners and improve their knowledge and training for better identification, prevention, and treatment of HCAI? | 23 | 23 | 23 | 69 |
| H | How can we improve the antimicrobial prescription by junior doctors? | 24 | 24 | 24 | 72 |
| C | Should the requirement for urinary catheters be periodically reviewed in people with long-term urinary catheter? | 30 | 30 | 13 | 73 |
| Q | What are the alternatives to single room isolation of people with antibiotic resistant bacteria so that the care of such people can be improved? | 25 | 25 | 25 | 75 |
| W | Do sensor operated taps, toilet lids, and door opening in hospitals prevent HCAI? | 26 | 26 | 26 | 78 |
| E | Are single-day antibiotics better than longer course of antibiotics in treating urinary tract infection? | 27 | 27 | 27 | 81 |
| CC | What is the risk posed to the patients admitted in hospital by visitors in spreading all infections including Norovirus and flu? | 28 | 28 | 28 | 84 |
| Y | How can we improve the awareness of health-care professionals about sepsis? | 29 | 29 | 29 | 87 |
| D | What is the best antibiotic treatment for urinary tract infection? | 31 | 31 | 31 | 93 |
| S | Are bacteriophages better than antibiotics in people with antibiotic resistant bacteria? | 32 | 32 | 32 | 96 |

# **Appendix 6.** Final ranks of questions

|  |  |  |  |
| --- | --- | --- | --- |
| **ID** | **Question** | **Final Rank** | **Merged** |
| M | How can infections be identified early? | 1 |  |
| K | How can we change the behaviour of healthcare professionals to follow best practices in preventing and controlling HCAI? | 2 |  |
| V | Can rapid point-of-care testing (bedside testing) for infections at the time of hospital admission decrease HCAI, length of hospital stay, and deaths in people requiring hospital admission? | 3 | Questions V and BB were combined to:  Can rapid point-of-care testing (bedside testing) for infections decrease antibiotic use, decrease community antibiotic resistance, and improve patient outcomes in primary and secondary care? |
| BB | Can point-of-care bacterial testing (bedside bacterial testing) decrease the antibiotic use in primary care and decrease community antibiotic resistance? | 3 |  |
| G | What is the most effective cleaning agent to prevent multi-drug resistant organisms? | 4 | Question G was revised to:  What is the most effective cleaning agent, technique, and systems to prevent multi-drug resistant organisms? |
| R | Can antibiotic stewardship policies decrease antibiotic resistance, and do they cause any harm to the patients? | 5 | Questions R and DD were combined to:  Can antibiotic stewardship policies (including decreased antimicrobial use by health professionals) decrease antibiotic resistance, and do they cause any harm to the patients? |
| DD | Does decreasing antimicrobial use by health professionals decrease antibiotic resistance? | 5 |  |
| FF | How can we educate patients to look for clinical signs of HCAI? | 6 |  |
| A | What is the role of change of bacteria in patients or the environment in the development of infection in hospital? | 7 |  |
| Z | In people with antibiotic resistant bacteria, what is the impact of single room isolation compared with open-ward care in the overall care and mental health of the person with antibiotic resistance and in preventing transmission of infections to others? | 8 |  |
| O | Does infection prevention and control training of patients and carers help in the prevention of infection in vulnerable patients being cared for in their own homes? | 9 | Question O was revised to:  Does infection prevention and control training of patients and carers help in the prevention of infection in patients at high risk of infections being cared for in their own homes? |
| P | How can the development and severity of urinary tract infections in elderly be decreased? | 10 |  |
| L | How can we alter the public perception of antibiotics in order to ensure that antibiotics are not sought for conditions for which there is no benefit? | 11 |  |
| B | How does individualised antimicrobial dosing compare with standard dosing regimen in patients admitted in intensive care unit with infections? | 12 |  |
| N | Is screening and isolation of patients with antibiotic resistant bacteria effective (in decreasing transmission of infections and deaths)? | 13 |  |
| AA | How effective is alcohol gel in preventing HCAI? | 14 |  |
| I | How can we improve general hygiene and hand hygiene in hospital visitors? | 15 |  |
| J | Is outpatient antibiotic therapy better than inpatient antibiotic therapy in people requiring intravenous antibiotics? | 16 |  |
| EE | Can nanotechnology (that is working with very small particles) result in better treatments for infection? | 17 |  |
| X | How can chest infections be prevented in elderly people admitted to hospital? | 18 |  |
| F | Does antibiotic prescription based on point-of-care (bedside) C-reactive protein to diagnose bacterial infection decrease amount of antibiotic prescription, antibiotic resistance, and hospital admission due to community-acquired pneumonia? | 19 |  |
| T | Does keeping intravenous lines connected for 72 hours decrease HCAI compared to frequent connection and disconnection of intravenous lines in patients with intravenous lines? | 20 |  |
| U | How can we improve the resources available to healthcare professionals , volunteers, and cleaners and improve their knowledge and training for better identification, prevention, and treatment of HCAI? | 21 |  |
| H | How can we improve the antimicrobial prescription by junior doctors? | 22 |  |
| C | Should the requirement for urinary catheters be periodically reviewed in people with long-term urinary catheter? | 23 |  |
| Q | What are the alternatives to single room isolation of people with antibiotic resistant bacteria so that the care of such people can be improved? | 24 |  |
| W | Do sensor operated taps, toilet lids, and door opening in hospitals prevent HCAI? | 25 |  |
| E | Are single-day antibiotics better than longer course of antibiotics in treating urinary tract infection? | 26 |  |
| CC | What is the risk posed to the patients admitted in hospital by visitors in spreading all infections including Norovirus and flu? | 27 |  |
| Y | How can we improve the awareness of health-care professionals about sepsis? | 28 |  |
| D | What is the best antibiotic treatment for urinary tract infection? | 29 |  |
| S | Are bacteriophages better than antibiotics in people with antibiotic resistant bacteria? | 30 |  |

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