Reference	Topic Classification	Geographic Region	Setting	Design	Justification of RCT (and example of text if applicable)	Level of Inference for Primary Outcome	Sample size estimate accounts for clustering	ICC or CV reported? (value if available)	# of Clusters	Consent	Intervention(s)	Outcome(s)	Matching and/or Stratification	Efforst to minimize bias and/or contamination	Analyses adjusted for clustering
Anderson O, Hanna GB. Effectiveness of the CareCentre at improving contact precautions: randomized simulation and clinical evaluations. Journal of Hospital Infection. 92(4):332-6, 2016 Apr.	HAI	Europe	9 acute medical and surgical wards with at least two 4-6 bedded rooms in London, UK	Cluster RCT with cross-over	Yes	Individual level	No	No	9	Unknown	1. Intervention rooms had several Care Center(end-of-hospital-bed table incorporating a writing surface, patient charts, alcohol-based hand rub, aprons, gloves, medication lockers, and waste bin)	Primary: Hand hygiene (number of opportunities with any attempt to disinfect hands regardless of technique/number of opportunities for hand hygiene). Secondary: Donning and disposing gloves and aprons.	None	No wash out period was used, but they randomized the sequence of conditions.	No
Baldwin NS, Gilpin DF, Tunney MM, Kearney MP, Crymble L, Cardwell C, Hughes CM. Cluster randomised controlled trial of an infection control education and training intervention programme focusing on meticillin-resistant Staphylococcus aureus in nursing homes for older people. Journal of Hospital Infection 2011;76:36-41.	antibiotic resistance	Europe	32 nursing homes in Northern Ireland	Matched cluster RCT	No	Individual level	Yes	Yes (0.01)	32	Written informed consent was obtained from residents (or their next of kin) and staff	Infection control education and training programme	Primary: MRSA prevalence in residents and staff. Secondary: A change in infection control audit scores.	Nursing homes were matched and paired using baseline data related to the number of beds, staffing levels, infection control audit scores, and MRSA prevalence levels	A blinded infection control practitioner carried out infection control audits as validation of the audits performed by the researcher	Yes; Random effects meta-analysis models to calculate pooled relative risks and p values accounting for clustering within homes.
Blazejewski C; Wallet F; Rouze A; Le Guern R; Ponthieux S; Salleron J; Nseir S. Efficiency of hydrogen peroxide in improving disinfection of ICU rooms. Critical Care (London, England). 19:30, 2015 Feb 02.	Environment	Europe	France (University Hospital of Lille, 5 medical and surgical ICUs)	Cluster RCT with cross-over	No	Individual level	No	No	5	No informed consent was required due to the non-interventional design of the study	1. Hydrogen peroxide (H2O2) disifection (either with h2O2 aerosolization(aHP) or H2O2 vaporization (HPV)	Primary: efficiency of H202 in reducing the percentage of ICU rooms contaminated with MDRO. Secondary: compare H2O2 nmethods in reducing the percentage of MDRO and to compare the residual concentration of H2O2.	None	No washout periods, but the order of HPV and aHPP in different units were randomized	No
Bleasdale SC; Trick WE; Gonzalez IM; Lyles RD; Hayden MK; Weinstein RA. Effectiveness of chlorhexidine bathing to reduce catheter-associated bloodstream infections in medical intensive care unit patients. Archives of Internal Medicine. 167(19):2073-9, 2007 Oct 22.	HAI	North America	MICU (with 2 separate units) at one hospital in the United States	Cluster RCT with cross-over	Yes "we studied parellel units rather than randomly assigning the intervention at the patient level because a unit-level intervention likely would be more generalizable....and the effect at the group level may reduce risk of intra-unit spread of pathogens between patients"	Individual level	No	No	2	Waived consent	2% CHG clothes vs. soap and water	Primary: incidence of primary BSI and incidence of clinical (culture-neg) sepsis; Seconary: incidence of other infections	None	Two-week wash-out period	Yes; Included an interaction term for unit and intervention arm
Chami K; Gavazzi G; Bar-Hen A; Carrat F; de Wazieres B; Lejeune B; Armand N; Rainfray M; Hajjar J; Piette F; Rothan Tondeur M. A short-term, multicomponent infection control program in nursing homes: a cluster randomized controlled trial. Journal of the American Medical Directors Association. 13(6):569.e9-17, 2012 Jul.	HAI	Europe	47 nursing homes in France	Stratified cluster RCT	No	Both	Yes	Yes (0.04)	47	Directors or local stakeholders of participating nursing homes signed an agreement	Implementation of a bundle of infection prevention measures (education, posters, hand hygiene campaigns, surveys)	Primary: Total infection rate (urinary, respiratory, gastro	Proportionate stratified random sampling (4 strata) to allow equal respresentation by region and to control for patient characteristics at baseline	None	Yes; GEE "to analyze differences at the individual level, with the covariance structure appropriately adjusted for variability between and within clusters"
Climo MW, Yokoe DS, Warren DK, Perl TM, Bolon M, Herwaldt LA, Weinstein RA, Sepkowitz KA, Jernigan JA, Sanogo K, Wong ES. Effect of daily chlorhexidine bathing on hospital-acquired infection. New England Journal of Medicine. 2013 Feb 7;368(6):533-42.	HAI	North America	Nine intensive care units in six hospitals	Stratified cluster RCT with cross-over	No	Cluster level	No	No	9	Waived consent	Chlrohexidine bathing	MRSA or vre acquisition and hospital-acquired bacteremia (two separate outcomes)	Stratified by type of ICU and facility	Randomization was stratified by unit type. Adjusted for colonization pressure in the unit type. But there was also no washout period and there were multiple units within the same hospital	No
de Smet AM, Kluytmans JA, Blok HE, et al. Selective digestive tract decontamination and selective oropharyngeal decontamination and antibiotic resistance in patients in intensive-care units: an open-label, clustered group randomised, crossover study. Lancet Infect Dis 2011;11:372–380.	antibiotic resistance	Europe	Neatherlands (13 ICUs, multihospital)	Cluster RCT with cross-over	Yes	Cluster level	No	No	13	Waived consent	1. Selective digestive tract decontamination (SDD), selective oropharyngeal decontamination (SOD)	Primary: rates of acquisiton of bacteremia and respiratory tract colonization in ICU. Secondary: rate reduction, absolute risk reduction and numbers needed to treat.	None	Order of regimens were randomly assigned. Person in charge of randomization blinded to ICU identity. The study periods were preceded by wash-in and/or washout month.	No
de Smet AM, Kluytmans JA, Cooper BS, Mascini EM, Benus RF, van der Werf TS, van der Hoeven JG, Pickkers P, Bogaers-Hofman D, van der Meer NJ, Bernards AT, Kuijper EJ, Joore JC, Leverstein-van Hall MA, Bindels AJ, Jansz AR, Wesselink RM, de Jongh BM, Dennesen PJ, van Asselt GJ, te Velde LF, Frenay IH, Kaasjager K, Bosch FH, van Iterson M, Thijsen SF, Kluge GH, Pauw W, de Vries JW, Kaan JA, Arends JP, Aarts LP, Sturm PD, Harinck HI, Voss A, Uijtendaal EV, Blok HE, Thieme Groen ES, Pouw ME, Kalkman CJ, Bonten MJ: Decontamination of the digestive tract and oropharynx in ICU patients. N Engl J Med 2009, 360:20-31 [1].	antibiotic resistance	Europe	Neatherlands (13 ICUs, multihospital)	Cluster RCT with cross-over	Yes	Individual level	No	No	13	Waived consent	1. Selective digestive tract decontamination (SDD), selective oropharyngeal decontamination (SOD)	Primary: crude mortality at day 28. Secondary: in-hospital mortality , prevalence of antibiotic resistance, duration of mechanical ventilation, ICU stay, and hospital stay for surviving patients.	None	Order of regimens were randomly assigned. Person in charge of randomization blinded to ICU identity. The study periods were preceded by wash-in and/or washout month.	Yes; Random-effects logistic regression model
Derde LP, Cooper BS, Goossens H, Malhotra-Kumar S, Willems RJ, Gniadkowski M, Hryniewicz W, Empel J, Dautzenberg MJ, Annane D, Aragão I. Interventions to reduce colonisation and transmission of antimicrobial-resistant bacteria in intensive care units: an interrupted time series study and cluster randomised trial. The Lancet Infectious Diseases. 2014 Jan 31;14(1):31-9.	antibiotic resistance	Europe	13 ICUs across Europe	Parallel cluster RCT	No	Individual level	Yes	Yes (0.05)	13	Waived consent	Rapid screening (PCR for MRSA and VRE and chromogenic for highly resistant enterobacteriaceae (HRE))	Primary: acqusition of resistant bacteria (MRSA, VRE, or HRE) per 100 patient-days at risk. Secondary: incidence density rate of ICU-acquired colonization and bacteremia, length of stay in ICU, length of stay in the hospital,28 day mortality	None	None	Yes: Multi-level Poisson segmented regression analysis, allowing random variation between ICUs for baseline levels and trends
Erasmus V; Huis A; Oenema A; van Empelen P; Boog MC; van Beeck EH; Polinder S; Steyerberg EW; Richardus JH; Vos MC; van Beeck EF. The ACCOMPLISH study. A cluster randomised trial on the cost-effectiveness of a multicomponent intervention to improve hand hygiene compliance and reduce healthcare associated infections. BMC Public Health. 11:721, 2011 Sep 24.	Hand hygiene	Europe	1 ICU and 1 surgical unit in 16 hospitals in the Netherlands	Parallel cluster RCT	No	Individual level	No	No	16	Unknown	Implementation of a bundle of hand hygiene interventions (education, training, electronic dispensers, performance feedback)	Primary: observed HH compliance rate at baseline, 6, 12 and 18 mo; Secondary: prevalence of HAIs at baseline, 6, 12, 18 mo	None	None	Yes; mixed linear modeling techniques to compensate for HCWs being clustered within wards

Fuller C; Michie S; Savage J; McAteer J; Besser S; Charlett A; Hayward A; Cookson BD; Cooper BS; Duckworth G; Jeanes A; Roberts J; Teare L; Stone S. The Feedback Intervention Trial (FIT)--improving hand-hygiene compliance in UK healthcare workers: a stepped wedge cluster randomised controlled trial. PLoS ONE [Electronic Resource]. 7(10):e41617, 2012.	Hand hygiene	Europe	16 English/Welsh Hospitals (44 acute care of the ederly or general medicine wards and 16 ICUs)	Cluster RCT with stepped-wedge	Yes	Individual level	Yes	No	16	Ward managers, IC nurses, ward coordinators gave written consent	1. Behaviourally designed feedback intervention for hand hygiene compliance (bedside placement of alcohol hand-rub, posters, and patient empowerment materials encouraging HCWs to watch their hands, plus audit and feedback at least once every 6 months)	Primary: Hand Hygiene compliance	None	Allocation of each hospital was concelead for the rest of the hospitals. Ward coordinators were asked to fill out a form to record observations, feedback, goals, and action plans each time an observation/feedback took place (fidelity of intervention)	Yes: Mixed-effects logistic regression, allowing for dependencies of observations made within hospitals and wards.
Gerber JS; Prasad PA; Fiks AG; Localio AR; Grundmeier RW; Bell LM; Wasserman RC; Keren R; Zaoutis TE. Effect of an outpatient antimicrobial stewardship intervention on broad-spectrum antibiotic prescribing by primary care pediatricians: a randomized trial. JAMA. 309(22):2345-52, 2013 Jun 12.	antibiotic stewardship	North America	Network of pediatric primary care practices in Pennsylvania and New Jersey, USA	Stratified cluster RCT	Yes	Individual level	Yes	No	18	A representative of each practice consented	One 1-hour on site clinician education session followed by 1 year of personalized, quaterly audit and feedback of prescribing for bacterial and viral ARTI	Primary: Rates of broad-spectrum (off-guideline) antibiotic prescribing for bacterial acute respiratory tract infections (ARTIs) and antibiotics for viral ARTIs for 1 year after intervention	Practices stratified by location and volume	None	Yes; Sandwich estimators
Gopal Rao G; Jeanes A; Russell H; Wilson D; Atere-Roberts E; O'Sullivan D; Donaldson N. Effectiveness of short-term, enhanced, infection control support in improving compliance with infection control guidelines and practice in nursing homes: a cluster randomized trial. Epidemiology & Infection. 137(10):1465-71, 2009 Oct.	HAI	Europe	12 nursing homes in London, UK	Matched cluster RCT	Yes	Cluster level	No	No	12	Unknown	Enhanced infection control support (additional staff and training)	Proportion of compliance with infection control guidelines as measured by an audit tool	Matched pair radomization by number of residents in the facility	None	No
Harris AD; Pineles L; Belton B; Johnson JK; Shardell M; Loeb M; Newhouse R; Dembry L; Braun B; Perencevich EN; Hall KK; Morgan DJ; Benefits of Universal Glove and Gown (BUGG) Investigators; Shahryar SK; Price CS; Gadbaw JJ; Drees M; Kett DH; Munoz-Price LS; Jacob JT; Herwaldt LA; Sulis CA; Yokoe DS; Maragakis L; Lissauer ME; Zervos MJ; Warren DK; Carver RL; Anderson DJ; Calfee DP; Bowling JE; Safdar N. Universal glove and gown use and acquisition of antibiotic-resistant bacteria in the ICU: a randomized trial. JAMA. 310(15):1571-80, 2013 Oct 16.	antibiotic resistance	North America	20 ICUs across the US	Matched cluster RCT	Yes	Cluster level	Yes	Yes (0.38)	20	Waived consent	HCWs were required to wear gloves and gowns for all patient contact and when entering any patient room.	Primary: Acqusition of MRSA or VRE as a composite. Secondary: Acquisition of MRSA and VRE as separate outcomes. Other: healthcare associated infections at the cluster level, adverse events, frequency of HCW room entry and hand compliance	ICUs were paired matched based on baseline MRSA or VRE acquisition rates	1. Matched pair was randomized to the intervention or control group. 2. Each site had a study coordinator and physician champion to lead implementation.	No
Huang SS, Septimus E, Kleinman K, Moody J, Hickok J, Avery TR, Lankiewicz J, Gombosev A, Terpstra L, Hartford F, Hayden MK, Jernigan JA, Weinstein RA, Fraser VJ, Haffenreffer K, Cui E, Kaganov RE, Lolans K, Perlin JB, Platt R (2013) Targeted versus universal decolonization to prevent ICU infection. N Engl J Med 368:2255–2265.	HAI	North America	16 states in the US	Parallel cluster RCT	Yes "chose this design to obtain results that could be generalized to the broadest set of hospitals, to use processes potentially adoptable by many hospitals,and to conduct a study of sufficient size with theavailable resources. Randomization of entire hospitals allowed us to recruit a broad array ofhospitals"	Individual level	Yes	Yes	43	Patient notices about group-specific protocols were posted in each ICU room. The requirementfor written informed consent was waived.	1- MRSA screening and isolation; 2- targeted decolonization (i.e., screening, isolation, and decolonization of MRSA carriers); 3- universal decolonization (i.e., no screening, and decolonization of all patients)	Primary: ICU-attributable, MRSA positive clinical cultures; Secondary: ICU-attributable bloodstream infection caused by MRSA and ICU-attributable bloodstream infection caused by any pathogen	Stratification and block randomization for: a) patient volume; b) baseline prevalence of MRSA carriage; c) state mandates for MRSA screening in ICU	Had a 4 month phase-in period	Yes; Proportional-hazards models with shared frailties accounted for clustering within hospitals
Huang SS; Septimus E; Hayden MK; Kleinman K; Sturtevant J; Avery TR; Moody J; Hickok J; Lankiewicz J; Gombosev A; Kaganov RE; Haffenreffer K; Jernigan JA; Perlin JB; Platt R; Weinstein RA; Agency for Healthcare Research and Quality (AHRQ) DEcIDE Network and Healthcare-Associated Infections Program, and the CDC Prevention Epicenters Program. Effect of body surface decolonisation on bacteriuria and candiduria in intensive care units: an analysis of a cluster-randomised trial. The Lancet Infectious Diseases. 16(1):70-9, 2016 Jan.	HAI	North America	43 hospitals (74 adult ICUs) in the US	Parallel cluster RCT	No	Individual level	Yes	Yes	43	Patient notices about group-specific protocols were posted in each ICU room. The requirementfor written informed consent was waived.	1- MRSA screening and isolation; 2- targeted decolonization (i.e., screening, isolation, and decolonization of MRSA carriers); 3- universal decolonization (i.e., no screening, and decolonization of all patients)	*This is actually a secondary analysis of the study above* . Outcome for this "sub-study"= 1- high-level bacteriuria (≥50 000 colony forming units [CFU]/mL dueto a bacterial uropathogen), 2-high-level candiduria(≥50 000 CFU/mL), 3-any bacteriuria due to a bacterial uropathogen per 1000 ICU-attributable patient days.	Stratification and block randomization for: a) patient volume; b) baseline prevalence of MRSA carriage; c) state mandates for MRSA screening in ICU	Had a 4 month phase-in period	Yes; Proportional-hazards models with shared frailties accounted for clustering within hospitals (Shared frailties are similar to random intercept in mixed effects model and allow each hospital to have unique infection rate)
Huis A, Schoonhoven L, Grol R, Borm G, Adang E, Hulscher M, et al: Helping hands: A cluster randomised trial to evaluate the effectiveness of two different strategies for promoting hand hygiene in hospital nurses. Implement Sci 2011, 6:101.	Hand hygiene	Europe	3 hospitals with 60 wards in the Netherlands	Stratified cluster RCT	Yes	Individual level	Yes	Yes (ward=0.05, nurse=0.6)	60	Unknown (but an exempt study)	State-of-the-art strategy (education, reminders, feedback, and targeting adequate products and facilities) vs Extended strategy (plus active commitment and initiative of ward management, modelling of informal leaders at the ward, setting norms and targets within the team.	Primary: Hand hygiene compliance. Secondary: team climate, costs and health effects.	Wards stratified by type of ward (surgical, internal medicine, ICUs, pediatric)	To reduce hawthorne effect unobtusive observation were taken	Yes; Mixed-linear modeling considering ward random effects and HCW random effects
Huskins WC; Huckabee CM; O'Grady NP; Murray P; Kopetskie H; Zimmer L; Walker ME; Sinkowitz-Cochran RL; Jernigan JA; Samore M; Wallace D; Goldmann DA; STAR*ICU Trial Investigators. Intervention to reduce transmission of resistant bacteria in intensive care. New England Journal of Medicine. 364(15):1407-18, 2011 Apr 14.	antibiotic resistance	North America	18 ICUs at several hospitals in the US	Stratified cluster RCT	No	Cluster level	No	No	18	Waived consent	Expanded use of barrier precautions:Isolation at time of admission (if infected or colonized with MRSA or VRE the previous year and at any time during the ICU stay) and continue for the entire ICU stay. All other patients were assigned to universal gloving until their discharge or until the results of surveillance cultures were negative).	Primary: ICU-level incidence of new events of colonization or infection with MRSA or VRE per 1000 ICU patient days at risk. Secondary: incidences of colonization or infection with MRSA and VRE and process measures	Stratified by ICU type and baseline incidence of MRSA and VRE	Monitors in all patient rooms	No
Jernigan JA; Siegman-Igra Y; Guerrant RC; Farr BM. A randomized crossover study of disposable thermometers for prevention of Clostridium difficile and other nosocomial infections. Infection Control & Hospital Epidemiology. 19(7):494-9, 1998 Jul.	HAI	North America	1 hospital in the United States	Stratified cluster RCT with cross-over	No	Individual level	No	No	20	Unknown	Single use disposable thermometers vs. electronic thermometers	Outcomes: 1- Rates of CDI, 2- Total nosocomial diarrheal episodes, 3- Total nosocomial infections	Stratified randomization according to previous CDI rates	Cross-over (but no wash-out period)	No

Jeyaratnam D; Whitty CJ; Phillips K; Liu D; Orezzi C; Ajoku U; French GL. Impact of rapid screening tests on acquisition of meticillin resistant Staphylococcus aureus: cluster randomised crossover trial. BMJ. 336(7650):927-30, 2008 Apr 26.	HAI	Europe	1 hospital in the UK	Cluster RCT with cross-over	No	Individual level	Yes	No	10	Verbal consent from individual patients	Rapid PCR based on screening test for MRSA vs. conventional culture	MRSA acquisition	None	Wash-out period prior to cross-over	Yes; GEE with logit link for acquisition rate taking into account the clustered design
Jongerden IP; Buiting AG; Leverstein-van Hall MA; Speelberg B; Zeidler S; Kesecioglu J; Bonten MJ. Effect of open and closed endotracheal suctioning on cross-transmission with Gram-negative bacteria: a prospective crossover study. Critical Care Medicine. 2011 Jun ;39(6):1313-21.	antibiotic resistance	Europe	4 ICUs from 2 hospitals in The Netherlands	Cluster RCT with cross-over	Yes	Individual level	No	No	4	Waived consent and all patients were informed about study aims and consequences	Closed suctioning systems vs. open suctioning systems for patients requiring mechanical ventilation	Primary: cross-transmission of pseudomonas, acinetobacter or enterobacter, Secondary: acquisition rates of colonization	None	Two week phase in period and 4 week washout/washin period between cross-over	No
Lee SK; Aziz K; Singhal N; Cronin CM; James A; Lee DS; Matthew D; Ohlsson A; Sankaran K; Seshia M; Synnes A; Walker R; Whyte R; Langley J; MacNab YC; Stevens B; von Dadelszen P. Improving the quality of care for infants: a cluster randomized controlled trial. CMAJ Canadian Medical Association Journal. 181(8):469-76, 2009 Oct 13.	HAI	North America	12 NICUs at 12 hospitals in Canada	Parallel cluster RCT	No	Individual level	Yes	No	12	Unknown	Implementation of evidence-based practice for improving quality	Outcomes: 1- incidence of nosocomial infections, 2- incidence of bronchopulmonary dysplasia, 3- death and bronchopulmonary dysplasia (composite outcome), 3- several other secondary outcomes	None	Had a phase-in period	Yes; random-intercept multi-level logistic regression with random hospital-site effects
Looijmans-van den Akker I, van Delden JJ, Verheij TJ, van der Sande MA, van Essen GA, Riphagen-Dalhuisen J, et al. Effects of a multifaceted program to increase influenza vaccine uptake among health care workers in nursing homes: a cluster randomised controlled trial. Vaccine. 2010;28(31):5086–92.	Vaccination	Europe	33 nursing homes in the Netherlands	Stratified cluster RCT	No	Cluster level	Yes	Yes (0.107)	33	Unknown	Outreach visits by primary researcher, information meetings and appointment of a physician as local program coordinator	Uptake of influenza vaccine among healthcare workers	Randomization was stratified by number of beds, influenza vaccine uptake in 2005 and geographic region	Clusters are distinct and well separated	Yes; "To take account of the clustered design we used Generalised Estimated Equation analysis with nursing homes as the clustering variable to analyse data on influenza vaccine uptake." "We analyzed outcomes at the cluster level rather than individual level"
MacIntyre CR; Seale H; Dung TC; Hien NT; Nga PT; Chughtai AA; Rahman B; Dwyer DE; Wang Q. A cluster randomised trial of cloth masks compared with medical masks in healthcare workers. BMJ Open. 5(4):e006577, 2015 Apr 22.	Other	Asia	64 wards in a secondary/terciary-level hospitals in Hanoi, Vietnam	Parallel cluster RCT	Yes	Individual level	Yes	Yes (0.027)	64	Written informed consent was obtained by HCWs	1. Medical masks all times on their work shift, 2. cloth masks at all times on ther work shift (vs. control/standard of care)	Primary: Clinical respiratory illness, Influenza-like illness, Lab- confirmed viral respiratory infection	None	Laboratory results were blinded	Yes; cluster-adjusted chi-squares, log-binomial model using GEE to account for clustering by ward
MacIntyre CR; Wang Q; Seale H; Yang P; Shi W; Gao Z; Rahman B; Zhang Y; Wang X; Newall AT; Heywood A; Dwyer DE.A randomized clinical trial of three options for N95 respirators and medical masks in health workers. American Journal of Respiratory & Critical Care Medicine. 187(9):960-6, 2013 May 01.	Other	Asia	19 tertiary hospitals (68 wards) in Beijing,China	Parallel cluster RCT	Yes	Individual level	Yes	Yes (0.027)	68	Written informed consent was obtained by HCWs	1. Medical masks at all times on shift 2. N95 respirators at all times on shift. 3. targeted (intermittent) use of N95 respirators only while doing high-risk procedures or barrier.	Primary: Clinical respiratory illness, Influenza-like illness, Lab- confirmed viral respiratory infection, lab-confirmed influenza, and laboratory confirmed bacterial colonization in symptomatic subjects	None	None	Yes: cluster-adjustes chi-squares, cluster-correlated robust estimate of variance was used to estimate the standard error of HR
Marsteller JA; Sexton JB; Hsu YJ; Hsiao CJ; Holzmueller CG; Pronovost PJ; Thompson DA.A multicenter, phased, cluster-randomized controlled trial to reduce central line-associated bloodstream infections in intensive care units*. Critical Care Medicine. 40(11):2933-9, 2012 Nov.	HAI	North America	35 hospitals across 12 states (45 ICUs) in the US	Cluster RCT with stepped-wedge	Yes	Cluster level	No	No	45	Waived consent	1. Multifaceted intervention based on evidence-based practices: hand-washing before line placement, using full barrier precaution, avoiding line placement at the femoral site, usinf chlorhexidine to cleanse site, and removing unnecessary lines.	Primary: quarterly rate of CLABSIs	None	The analysis was adjusted by hospital system. To reduce Hawthorne effect by not collecting CLASI rates from the control group during phase 1.	Yes; Robust clustering to account for shared variation
Melsen WG, De Smet AM, Kluytmans JA, Bonten MJ. Selective decontamination of the oral and digestive tract in surgical versus non-surgical patients in intensive care in a cluster-randomized trial. British Journal of Surgery. 2012 Feb 1;99(2):232-7.	antibiotic resistance	Europe	Netherlands, 13 ICUs	Cluster RCT with cross-over	No	Individual level	No	No	13	Unknown	1. Selective digestive decontamination (SDD), Selective oropharyngeal decontamination (SOD) or standard care	Primary: 28-day mortality rate. Secondary: duration of mechanical ventilation, duration of ICU, hospital length of stay, bacteremias rates.	None	None	No; " ICU clustering effects were not taken into account because cluster effects were not found in earlier analysis and would therefore not change the results"
Mertz D , N Dafoe , S Walter , K Brazil , M Loeb . Effect of a multifaceted intervention on adherence to hand hygiene among healthcare workers: a cluster-randomized trial. Infect Control Hospital Epidemiol 2010;31:1170–1176.	Hand hygiene	North America	30 units in 3 hospitals in Canada	Stratified cluster RCT	No	Cluster level	Yes	Yes (0.05)	30	Unknown	Multimodal hand hygiene improvement strategy (education, performance feedback, posters)	Primary: Adherance with hand hygiene, Secondary: Incidence of hospital-acquired MRSA colonization	Randomization was stratifed by hospital site and type of hospital unit	Had a 3 month baseline period	No; "The unit of analysis for this study was at the cluster level", used unpaired t-tests and Mann-whitney U tests
Milstone AM, Elward A, Song X, Zerr DM, Orscheln R, Speck K, Obeng D, Reich NG, Coffin SE, Perl TM (2013) Daily chlorhexidine bathing to reduce bacteraemia in critically ill children: a multicentre, cluster-randomised, crossover trial. Lancet 381:1099–1106.	HAI	North America	10 pediatric ICUs in 5 US hospitals	Cluster RCT with cross-over and multiple periods	Yes; "Although relatively underused, especially in children, the cluster-randomised crossover design is a strength of this study. Incorporating a crossover into the design enabled us to estimate the treatment eff ect by comparing each unit with itself during treatment and control periods,"	Individual level	Yes	Yes(design effect =1.2)	10	consented caregivers of neonatal ICU patients	chlorhexidine bathing	primary: bacteremia; main secondary outcome: CLABSI, ;additional secondary outcomes: SSI and MRSA and VRE clinical culture rates	Stratification at the hospital and ICU level	Used a short washout period (2 weeks)	Yes; "... used Poisson regression models to estimate adjusted incidence rate ratios (aIRRs), adjusted for unit,secular trends in infection rates over time, and characteristics of patient admissions. The period effect was not significant in any analyses. We accounted for hospital level clustering with a robust variance estimator."
Nijssen S; Fluit A; van de Vijver D; Top J; Willems R; Bonten MJ. Effects of reducing beta-lactam antibiotic pressure on intestinal colonization of antibiotic-resistant gram-negative bacteria. Intensive Care Medicine. 36(3):512-9, 2010 Mar.	antibiotic stewardship	Europe	2 ICUs at 1 hospital in the Netherlands	Cluster RCT with cross-over	No	Individual level	No	No	2	Waived consent	Reduction of B-lactam exposure	Primary: acquisition of CRE	None	Eight month baseline period	No
Noto MJ, Domenico HJ, Byrne DW, Talbot T, Rice TW, Bernard GR, Wheeler AP (2015) Chlorhexidine bathing and health care-associated infections: a randomized clinical trial. JAMA 313:369–378.	HAI	North America	United States (5 ICUs in 1 terciary medical center in Nashville, Tennessee)	Cluster RCT with cross-over	Yes	Individual level	No	No	5	Unknown	Once a day bathing with cloths impregnated with 2% chlorhexidine	Primary: composite of CLABSIs, CAUTIs, VAP, *C.diff*. Secondary: individual rates of CLABSIs, CAUTIs, VAP, *C.diff*, in-hospital mortality, hospital and ICU length of stay, rates of clinical cultures positive for MDRO, blood culture contamination, HAIs, and rates of the primary outcomes per ICU.	None	1. Two week washout period between intervention and control periods. 2. Multiple crossover periods	No

Oostdijk EA; Kesecioglu J; Schultz MJ; Visser CE; de Jonge E; van Essen EH; Bernards AT; Purmer I; Brimicombe R; Bergmans D; van Tiel F; Bosch FH; Mascini E; van Griethuysen A; Bindels A; Jansz A; van Steveninck FA; van der Zwet WC; Fijen JW; Thijsen S; de Jong R; Oudbier J; Raben A; van der Vorm E; Koeman M; Rothbarth P; Rijkeboer A; Gruteke P; Hart-Sweet H; Peerbooms P; Winsser LJ; van Elsacker-Niele AM; Demmendaal K; Brandenburg A; de Smet AM; Bonten MJ. Effects of decontamination of the oropharynx and intestinal tract on antibiotic resistance in ICUs: a randomized clinical trial. JAMA. 312(14):1429-37, 2014 Oct 08.	antibiotic resistance	Europe	Netherlands, 16 ICUs	Cluster RCT with cross-over	No	Cluster level	Yes	Yes (0.01)	16	Waived consent	Selective digestive decontamination (SDD)or Selective oropharyngeal decontamination (SDD)	Primary: Unit-wide prevalence of antibiotic resistant Gram-negative bacteria. Secondary: day-28 mortality, ICU acquired bateremia, length of stay in the ICU	Two strata based on presence or absence of applying selective decontamination in the unit for more than 4 months prior to the start of the study	One month wash-in and wash-out period. To minimize inclusion bias, all patients who received at least 1 dose of SDD or SDO were eligible, as were all patients with an ICU stay of at least 48 hours, irrespective whether their SDD or SOD. All ICUs were visited at least 7 times to monitor the study.	No
Parienti JJ; du Cheyron D; Ramakers M; Malbruny B; Leclercq R; Le Coutour X; Charbonneau P; Members of the NACRE Study Group. Alcoholic povidone-iodine to prevent central venous catheter colonization: A randomized unit-crossover study. Critical Care Medicine. 32(3):708-13, 2004 Mar.	HAI	Europe	2 units at 1 hospital in France	Cluster RCT with cross-over	No	Individual level	No	No	2	Unknown	Alcoholic povidone iodine vs. aqueous povidone iodine	1- Catheter colonization rate, 2- Catheter-related bacteremia, 3- Catheter-related infection	None	Performed a matched case-control within the study	No
Parienti JJ; Thibon P; Heller R; Le Roux Y; von Theobald P; Bensadoun H; Bouvet A; Lemarchand F; Le Coutour X; Antisepsie Chirurgicale des mains Study Group. Hand-rubbing with an aqueous alcoholic solution vs traditional surgical hand-scrubbing and 30-day surgical site infection rates: a randomized equivalence study.[Erratum appears in JAMA 2002 Dec 4;288(21):2689 Note: Bensadoun, Herve [corrected to Bensadoun, Henri]]. JAMA. 288(6):722-7, 2002 Aug 14.	Hand hygiene	Europe	6 surgical services from 4 hospitals in France	Cluster RCT with cross-over and multiple periods	Yes; "In our study, differences in the characteristics of the patients and surgical personnel were minimized by the randomized service cross-over experimental design"	Individual level	No	No	6	Unknown	Hand rubbing (75% aqueous alcohol solution containing propanol) vs. Hand scrubbing (4% povidone iodine or 4% CHG)	Primary:30-day SSI rates; Secondary: OR team tolerance and compliance	None	Multiple periods (switched every month)	No
Riphagen-Dalhuisen J, Burgerhof JG, Frijstein G, van der Geest-Blankert AD, Danhof-Pont MB, de Jager HJ, et al. Hospital-based cluster randomised controlled trial to assess effects of a multi-faceted programme on influenza vaccine coverage among hospital healthcare workers and nosocomial influenza in the Netherlands, 2009 to 2011. Euro Surveill. 2013;18(26):20512.	Vaccination	Europe	University medical centers in the Netherlands	Parallel cluster RCT	Yes	Cluster level	Yes	Yes (10%=0.01)	6	Waived consent	Intervention Mapping Method based influenza vaccination program	Primary: Influenza vaccine uptake among all HCWs at UMC level. Secondary: absenteeism rates among HCWs, laboratory confirmed influenza, pneumonia, length of stay, admittance to ICU and duration.	None	Researcher in charge of randomization was blinded to the identity of the UMCs.	Yes: Generalized linear mixed model to account for dependencies of individual observations between hospitals
Rodriguez V; Giuffre C; Villa S; Almada G; Prasopa-Plaizier N; Gogna M; Gibbons L; Garcia Elorrio E; Argentinian Group Hand Hygiene Improvement. A multimodal intervention to improve hand hygiene in ICUs in Buenos Aires, Argentina: a stepped wedge trial. International Journal for Quality in Health Care. 27(5):405-11, 2015 Oct.	Hand hygiene	South America	Buenos Aires, Argentina	Cluster RCT with stepped-wedge	No	Individual level	Yes	Yes(0.005-0.03)	11	HCWs signed an informed consent before baseline assessment to confirm participation agreement	1. A signed letter from leaders with the commitment to support the project and the participation of directors in monthly executive walk-roundswere asked fromhospital directors and unit leaders fortnightly and then monthly.2. Availability of alcohol-based hand rub and materials needed to comply with hand hygiene was daily surveyed and re-supplied. 3. Reminders placed at the entrance of patient's rooms and in common areas. 4. A storyboard was used to display the letter signed by directors,results of monthly observations and photos of the healthcare team. 5. Every month, coordinators of intervened sites received results of the indicator and they showed them in the storyboard comparing it to the best performance in study or to an international performance of 95%.	Primary: Compliancewith hand hygiene based on the 5 moments WHO survey tool. Secondary: Change in hand hygiene compliance according to predictor's variables such as type of HCWs, shifts and hand hygiene situation.	None	Site coordinators were instructed not to start any intervention beforehand and to report only what asked at each observation period	Yes: Generalized estimating equation was used to test the intervention. The first model included a random effect for the health provider and a fixed effect for the intervention. The second model included the last two parameters reported plus the fixed effect corresponding to the time period as recommended by Hussey and Hughes, 2007.
Roisin S; Laurent C; Denis O; Dramaix M; Nonhoff C; Hallin M; Byl B; Struelens MJ. Impact of rapid molecular screening at hospital admission on nosocomial transmission of methicillin-resistant Staphylococcus aureus: cluster randomised trial. PLoS ONE [Electronic Resource]. 9(5):e96310, 2014.	antibiotic resistance	Europe	Belgium, Erasme Hospital (7 wards)	Cluster RCT with cross-over	No	Cluster level	No	No	7	Waiver of consent	Rapid screening of test for MRSA (vs. enrichment culture using chromogenic agar)	Primary: incidence density rate of nosocomial MRSA acquisition per 1000 patient-days. Secondary: time between admission and notification of MRSA positive culture, time between admission of newly detected MRSA carriers and their placement in isolation, the percentage of captured MRSA isolation days, cumulative incidence of nosocomial MRSA acquisition per 100 admissions.	None	One month washout period without intervention	No
Rupp ME; Fitzgerald T; Puumala S; Anderson JR; Craig R; Iwen PC; Jourdan D; Keuchel J; Marion N; Peterson D; Sholtz L; Smith V. Prospective, controlled, cross-over trial of alcohol based hand gel in critical care units . Infection Control & Hospital Epidemiology. 29(1):8-15, 2008 Jan.	Hand hygiene	North America	2 units at 1 hospital in the USA	Cluster RCT with cross-over	No	Individual level	No	No	2	Unknown	Alcohol based hand gel vs. soap and water	Primary: 1- Hand hygiene adherance rate, 2- incidence of nosocomial infection, Secondary: contamination of nurses' hands	None	None	Yes; "GEE were used to analyze HH adherance rates over time and their relationship to job category and hand gel availability, appropriately accounting for the potential correlation among observations."
Septimus EJ; Hayden MK; Kleinman K; Avery TR; Moody J; Weinstein RA; Hickok J; Lankiewicz J; Gombosev A; Haffenreffer K; Kaganov RE; Jernigan JA; Perlin JB; Platt R; Huang SS. Does chlorhexidine bathing in adult intensive care units reduce blood culture contamination? A pragmatic cluster-randomized trial. Infection Control & Hospital Epidemiology. 35 Suppl 3:S17-22, 2014 Oct.	HAI	North America	43 hospitals with 74 ICUs in the US	Parallel cluster RCT	No	Individual level	No	No	43	Unknown	1. MRSA Screening and isolation 2. Plus Targeted decolonization of MRSA carriers, 3. No screening with universal decolonization of all patients with mupirocin and CHG bathing	Primary: rates of blood contamination	None	Design included around a 4-month period to phase in the intervention, all ICUs from one hospital had the same intervention	Yes: generalized linear mixed models to account for the cluster-randomized design of the trial

Speroff T; Ely EW; Greevy R; Weinger MB; Talbot TR; Wall RJ; Deshpande JK; France DJ; Nwosu S; Burgess H; Englebright J; Williams MV; Dittus RS. Quality improvement projects targeting health care-associated infections: comparing Virtual Collaborative and Toolkit approaches. Journal of Hospital Medicine (Online). 6(5):271-8, 2011 May.	HAI	North America	60 hospitals in the US	Parallel cluster RCT	Yes; "To minimize contamination bias between study groups within the same facility, the unit of randomization was the hospital and implementation was at the level of the ICU."	Individual level	No	No	60	By hospital leadership	Virtual collaborative vs toolkit only	CLABSI and VAP rates	Hospitals matched on geographic location and ICU volume	None	Yes; "... and account for clustering of ICUs within hospitals and adjusting for baseline covariates."
Stevenson KB , K Searle , G Curry , et al. Infection control interventions in small rural hospitals with limited resources: results of a cluster-randomized feasibility trial. Antimicrob Resist Infect Control 2014;3:10.	HAI	North America	10 rural community hospitals in 2 US states	Parallel cluster RCT	Yes	Individual level	No	No	10	Patient consent required for surveillance cultures	Individualized campaigns to promote hand hygiene, isolation compliance and outbreak control vs. current infection control practice	Primary: Hand hygiene compliance; Also measured patient colonization with MRSA and VRE	None	Implemented the study in areas where clusters are distinct and well separated; "The selected hospitals were separated by significant geographical distances in both states."	Yes; "...analyzed using mixed effects logistic regression to model the probability of compliance. These models accountd for the lack of independence introducted by the individual HH opportunities being nested within hospial."
Var C; Bazzano AN; Srivastav SK; Welty JC; Ek NI; Oberhelman RA. Newborn Infection Control and Care Initiative for health facilities to accelerate reduction of newborn mortality (NICCI): study protocol for a randomized controlled trial. Trials [Electronic Resource]. 16:257, 2015 Jun 05.	HAI	Asia	16 health-centers in Takeo, Cambodia	Cluster RCT with stepped-wedge	Yes	Individual level	No	No	16	Individual patient consent	1. The Newborn Infection Control and Care Initiative: community and health facility linked intervention to improve health outcomes for newborns addressing infection control in the perinatal period in health facilities, promoting infection prevention and control practices in health center and home environments, and improving timeliness of referrals of newborns with suspected infections to appropiate health facilities.	Primary: percentage of mothers who know at least three danger signs, percentage of volunteers who know six danger signs, percent of families who seek care from an appropiate facilty, decreased time between onset of suspected danger signs and referral to appropiate facility, proportion of hand washing at key events by families, proportion of hand washing at key points by health center staff	None	None	Yes: Analysis perfomed accounting for potential within-cluster correlation using random effect model, multilevel model or GEE
Wilson AP; Smyth D; Moore G; Singleton J; Jackson R; Gant V; Jeanes A; Shaw S; James E; Cooper B; Kafatos G; Cookson B; Singer M; Bellingan G. The impact of enhanced cleaning within the intensive care unit on contamination of the near-patient environment with hospital pathogens: a randomized crossover study in critical care units in two hospitals. Critical Care Medicine. 39(4):651-8, 2011 Apr.	Environment	Europe	2 hospitals in the UK	Cluster RCT with cross-over	Yes; "To avoid seasonal bias..."	Individual level	Yes	No	2	Waived consent	Enhanced cleaning of the near-patient environment	Primary: Environmental contamination from 5 sites and patient hands; Secondary: new patient acquisition of MRSA	None	Multiple cross-over periods "Each hsopital had 3 cleaning phases of each type"; One week wash-out period between each phase to minimize residual effects of the copper biocide in the microfiber cloth; and to "avoid seasonal bias, the study was divided into six 8-week blocks	Yes; "A mixed logistic regression model was fitted with the bed areas defined as a random-effect term."
Yeung WK, WSW Tam , TW Wong . Clustered randomized controlled trial of a hand hygiene intervention involving pocket-sized containers of alcohol-based hand rub for the control of infections in long-term care facilities. Infect Control Hospital Epidemiol 2011;32:67–76.	Hand hygiene	Asia	7 community-based, private, or semi-private, residential LTCF in Hong Kong	Stratified cluster RCT	No	Individual level	No	No	7	Consent was collected from the LTCFs and the residents or their guardians	Multifaceted hand hygiene intervention: Pocket-sized containers of alcohol -based gel, reminder materials, and HCW education	Primary: HCW Hand hygiene compliance, Secondary: rates of infection requiring hospitalization, outbreaks and isolated cases of influenza, norovirus infection	LTCF were stratified by nursing staffing levels and level of resident disability	There were no observation recorded while the intervention was been implemented.	No