UK Health Security Agency

Effectiveness of different isolation strategies for people with suspected or confirmed *Clostridioides difficile* infection in health and social care settings where care is provided

A rapid systematic review

Contents

Main messages

1. This rapid systematic review (search up to up to 15 May 2025) identified and summarised evidence relating to the effectiveness isolation strategies to prevent transmission of *Clostridioides difficile* (*C. difficile*) in health and social care settings where care is provided.

2. Twelve studies were included (1 to 12). One study was a prospective non-randomised controlled study (1) and the other 11 studies were quasi-experimental by design (where the research approach aimed to establish a cause-and-effect relationship but did not involve random assignment of participants) (2 to 12).

3. Four studies were conducted in Canada (1 to 4), 3 studies were conducted in the UK (5 to 7), 2 in the USA (8, 9) one in Belgium (10), one in Japan (11) and one in South Korea (12). All evidence identified was from hospital settings, no evidence was identified from care homes, adult social care settings, outpatient and community care settings, mental health facilities or prisons.

4. One prospective non-randomised study identified showed no difference in the *C. difficile* incidence rate for medical patients admitted to predominately single room ward compared to a multibed ward. Although due to capacity issues, some of the single rooms in the new design ward were converted to multibed rooms during the study. The certainty of evidence could not be assessed but potential risks of bias identified in this study related to differences in ages and treatments received between the intervention and control participants as well as a lack of reporting on patient follow-up (1).

5. Four studies were identified that assessed the effectiveness of isolation interventions as part of hospital moves or redesigns. Three studies were identified that assessed whether majority single-patient rooms (created as part of hospital moves or redesigns), compared to small numbers of single rooms (10 to 27%) or multi-bed rooms was associated with decreased rates of *C. difficile* incidence. All 3 studies reported that settings with a majority of single-patient rooms were associated with a reduction in *C. difficile* incidence (3, 5, 11). One study, as part of a hospital move, compared isolation from point of admission to isolation from point of *C. difficile* diagnosis, it reported no effect on *C. difficile* rates (2). The certainty of evidence was rated very low.

6. Four studies were identified that assessed the effectiveness of isolation interventions in outbreak contexts. One study reported that cohorting patients with *C. difficile*, compared to non-cohorting was associated with a lower *C. difficile* infection rate (non-cohorting wards were not described in detail by the study) (4). One study reported that cohorting patients with *C. difficile*, compared to single room isolation was associated with a lower *C. difficile* infection rate. The cohorting intervention also included a single

medical and nursing team for the isolated cohort and limited staff and patient movement and may explain why it was more effective than single room isolation (10). One study reported that maintaining isolation for the duration of hospitalisation compared to isolation for duration of *C. difficile* illness was associated with a reduced *C. difficile* infection rate (8). The fourth study reported that maintaining isolation from the point of symptom development compared to from confirmation of *C. difficile* was associated with a reduced *C. difficile* infection rate (9). The certainty of evidence was rated very low.

7. Three studies were identified that assessed the effectiveness of isolation interventions in endemic contexts. One study assessed the effectiveness of single room isolation compared to no isolation and reported a decrease in the *C. difficile* incidence rate compared to the predicated rate (12). One study reported a reduction in *C. difficile* incidence rate following the creation of an isolation unit (compared to no isolation unit) (6). The third study assessed the effectiveness of a cohort ward compared to single room isolation and reported a reduction in *C. difficile* incidence rate. The cohorting ward had dedicated nursing staff and was restricted to patients with *C. difficile* infection and may explain why it was more effective than single room isolation (7). The certainty of evidence was rated very low.

8. The available evidence was rated as very low certainty using a modified Grading of Recommendations, Assessment, Development and Evaluations (GRADE) approach (13), mainly due to risk of bias in the studies where the potential for confounding could not be excluded. Four studies provided too little information to be assessed using GRADE (1, 6, 9, 12). All 4 studies were at high risk of bias, due to incomplete reporting of patient characteristics, treatment or follow-up.

9. In conclusion, the findings of this evidence review suggest that isolation strategies including single-patient rooms, cohorting patients with *C. difficile*, isolation for the duration of hospitalisation or from the point of symptom development (rather than from confirmation of *C. difficile*) were associated with a reduction in *C. difficile* incidence. Two studies found cohort wards to lead to a reduction in *C.difficile* incidence compared to single room isolation, both included dedicated cohort medical staff. Where it could be assessed, the evidence was rated as very low certainty and was subject to risk of bias across all studies. Most studies did not report information on trends in *C. difficile* incidence over time therefore limiting the ability to assess whether changes in infection rates were due to the intervention or other factors. The conclusions of this review should therefore be interpreted with caution.

Purpose

The purpose of this rapid systematic review was to identify and summarise the available evidence on the effectiveness of different isolation strategies for people with suspected *C. difficile* infection.

The review question was:

1. What is the effectiveness of different isolation strategies for people with suspected or confirmed *Clostridioides difficile* (*C. difficile*) infection to prevent transmission in settings where health and social care is given?

This rapid systematic review was commissioned to help inform the update of UKHSA guidance on *C. difficile* infection: how to deal with the problem.

Methods

A rapid systematic review was conducted, following streamlined systematic methods to accelerate the review process and provide a timely, evidence-informed answer to the review question without compromising the rigour of the review process. A literature search was undertaken to look for relevant experimental studies, including randomised-controlled trials and quasi-experimental studies, and observational studies including comparative cohort, before-and-after, cross-sectional studies or case control studies published or available as preprint, up to 15 May 2025. Four databases were searched. Backwards and forwards searching of primary studies was carried out by searching Lens.org via CitationChaser. References that were included following full text screening were used as seed references.

The following contexts and settings were of interest for this review, as specified by subject matter experts: *C. difficile* outbreaks, clusters, periods of increased incidence or single cases. Any setting where care (defined as care administered by health or social care professionals, not care of dependents) is given (hospitals, care homes with or without nursing, adult social care settings, outpatient and community care settings, mental health facilities and prisons) was included. The outcomes of interest for this review were the onward transmission of *C. difficile* measured by: *C. difficile* incidence rate in the healthcare setting, *C. difficile* transmission rate in the healthcare setting or secondary *C. difficile* infection.

A protocol was produced before the literature search was conducted, including the review question, the eligibility criteria, and all other methods. Full details of the methodology are provided in the protocol in Annexe A. The protocol was reviewed by the ‘How to deal with the problem' working group 2025 and was also prospectively published on Prospero (an

international database for the prospective registration of systematic reviews) registration number: CRD420251063414). There were no deviations from the protocol.

Screening on title and abstract was undertaken in duplicate by 2 reviewers for 20% of the eligible studies, with the remainder completed by one reviewer. Screening on full text was undertaken by one reviewer and checked by a second. Data extraction was performed by one reviewer and checked by a second. Disagreement was resolved by discussion.

Risk of bias assessment was conducted in duplicate by 2 reviewers. The JBI tool for quasi-experimental studies was used for critical appraisal of included studies (14) as the data identified were from before-and-after studies, interrupted time series or natural experiments (hospital moves).

The certainty of evidence identified within this review was assessed across studies by outcome where appropriate, using a modified version of the GRADE approach (13). This process is described in detail in Annexe A. In brief, the certainty of evidence was assessed for each outcome across 4 domains:

1. Risk of bias: where results may not represent the true effect because of limitations in the design or conduct of the study (assessed using the appropriate JBI checklist (14).
2. Inconsistency: where studies show different effects for the same outcome.
3. Indirectness: where elements of the study differ from the review question.
4. Imprecision: a measure of how uncertain the result is.

Outcomes were given one of 4 ratings for certainty of evidence:

- very low (the true effect is probably different from the estimated effect)
- low (the true effect might be different from the estimated effect)
- moderate (the true effect is probably close to the estimated effect)
- high (the authors are confident that the true effect is similar to the estimated effect)

All evidence identified in this review started as low certainty evidence, due to their study design, and were assessed from that point. Outcomes from studies that were not similar enough to combine were assessed individually. In these cases, ‘inconsistency’ was not assessed. GRADE was not applied where there was no measure of variance reported with the outcome for a single study (for example, confidence intervals), as imprecision could not be assessed (risk of bias and indirectness alone are insufficient to effectively use GRADE).

Glossary of terms

This review includes specific terminology relating to measures of risk and statistical methods. These terms are defined below.

Term	Meaning
95% confidence intervals (CI)	the range of possible values surrounding a result, indicating the precision of the study's findings (95% refers to the expectation that, if the study were repeated many times, 95% of the time the result would fall within this range).
Beta coefficient (β-coefficient)	A number used in statistics to show how much one thing changes when something else changes. In time trend analyses, it indicates whether the outcome (for example, infection rate) is increasing or decreasing over time. A positive beta suggests an upward trend, while a negative beta indicates a downward trend. A beta close to zero implies little or no change.
Confounder	A variable that influences both the exposure and the outcome in a study, making it difficult to determine whether the observed effect is truly due to the exposure or partly (or entirely) due to the confounder.
Endemic context (hospital)	Infections are consistently present in the hospital over time (not just during an outbreak or a short-term spike).
Hyperendemic context (hospital)	Infections are persistently present at higher-than-usual levels within a hospital.
Incidence density	A measure of how frequently new cases of a disease or condition occur in a population, adjusted for the amount of time each individual is at risk. Typically expressed as the number of new cases per unit of time, such as per 1,000 patient-days.
Incidence rate	How frequently a new infection occurs in a group of people over a certain period of time.
Incidence rate (per patient-days)	A measure of the frequency of new cases of an infection, based on the total time patients are at risk.
Incidence rate ratio (IRR)	A measure used to compare the relative rate of infection occurring in 2 groups over time. It is calculated by dividing the incidence rate in one group by the incidence rate in another.

Term	Meaning
Patient bed-days	The total number of days that hospital beds are occupied by patients over a given period. This measure reflects the actual time patients spend admitted to hospital.
Patient-days	The total number of days patients receive care.
Poisson regression analysis	A statistical method used to understand and predict how often something happens.
Quasi-experimental study	Research approach aimed to establish a cause-and-effect relationship but did not involve random assignment of participants.
Relative effect	A measure of how much an outcome (for example, infection rate) changes in proportion to its original level due to an intervention.
Time series analysis	A statistical technique to analyse data points collected or recorded at specific time intervals (typically over days, months, or years) to identify patterns, trends, and other characteristics over time.

Evidence

In total, 1,600 studies were screened at title and abstract and 54 studies were identified to be screened at full text. However, the full texts of 2 records could not be retrieved and therefore 52 records were screened at full text. Additionally, 11 studies were identified from citation searching of included studies. As a result, 63 studies were screened at full text. Of these, 12 studies met the inclusion criteria. A PRISMA diagram showing the flow of studies through the review is shown in Annexe B, and studies excluded on full text screening are available (with exclusion reasons) in Annexe C. Study characteristics are available in Annexe D, risk of bias assessments are available in Annexe E and GRADE assessments are available in Annexe F.

One study was a prospective non-randomised controlled study (1) and the other 11 studies were quasi-experimental by design (where the research approach aimed to establish a cause-and-effect relationship but did not involve random assignment of participants) (2 to 12). Four studies were conducted in Canada (1, 2, 3, 4), 3 in the UK (5, 6, 7), 2 in the USA (8, 9), one in Belgium (10), one in Japan (11) and one in south Korea (12).

All evidence identified was from hospital settings. The interventions identified were various forms of isolation including moving to 100% single room hospital sites, cohorting and isolation from point of admission.

Prospective non-randomised controlled study (ward redesign)

Ellison and others (1) conducted a prospective non-randomised controlled study from June 2007 to February 2010 in Canada. The study reported the event rates of hospital-acquired *C. difficile* infection in a ward with predominantly single rooms (>80% single rooms) and in a multi-bed ward (>80% four-bed rooms) (see Table 1a and Table D.1. Annexe D for full details).

Table 1a. Prospective non-randomised comparing a ward with predominantly single rooms, with a ward with mainly multiple occupancy rooms

Study	Country, time period, population, context	Intervention – isolation strategy	Intervention – additional infection prevention control measures	Comparator – isolation strategy	*C. difficile* result
Ellison and others (1)	Canada June 2007 to February 2010 Patients (n=1,687) admitted to the general internal medicine service	New design: At least 80% single occupant rooms	Private bathrooms Hand-washing sink per room Hallway handwashing sink between each room	Historic design: At least 80% 4-bed rooms	*C. difficile* incidence density per 1,000 patient days: intervention: 1.16 control: 0.84 (p=0.57)

General medical patients were allocated to one of 2 types of medical wards, either the new design ward, which was more than 80% single occupancy rooms, or the historic design wards, which was more than 80% 4-bed rooms. The study authors stated that random allocation was not possible (due to high bed occupancy and the need to maintain rapid movement of patients through the emergency room). Patients who were admitted and remained for more than 48 hours were monitored for the development of hospital-acquired *C. difficile* infection. Patients admitted to the new design ward had a higher number of incident cases of *C. difficile* infection compared to the historic design wards (11 cases (1.2%) versus 5 cases (0.83%), respectively). There was no significant difference in the rate of new cases per 1,000 days that patients were in hospital and at risk: 1.16 (new design ward) versus 0.84 (historic design) (p=0.57) (1). Shortly after the study began, and due to capacity issues, 3 of the single rooms in the new design ward were converted to multibed rooms.

Beds in these converted rooms were in close proximity (one metre). Almost 50% of the patients on the new design ward experienced a stay in a multibed room following the introduction of the changes and the ability of the ward to function as a predominantly single-bed ward was significantly compromised. The certainty of evidence could not be assessed because the study did not report any measure of variability in the results. Potential risks of bias identified in the study included differences in ages and comorbidities between the intervention and control participants as well as a lack of reporting on patient follow-up. Patients admitted to the newly designed ward were generally younger and had fewer comorbidities, as indicated by lower comorbidity index scores. They were less likely to have conditions such as congestive heart failure, diabetes with chronic complications, hemiplegia or paraplegia, and metastatic solid tumours. These patients were also significantly more likely to be discharged home. Conversely, the new ward group included more individuals with diabetes without chronic complications, a higher number requiring isolation for other reasons, and a longer duration of antibiotic treatment.

Quasi-experimental studies (hospital moves/ward redesign)

Four quasi-experimental studies were conducted as part of hospital moves or ward redesign (2, 3, 5, 11) and investigated changes in *C. difficile* infection after relocation to new hospital sites or as part of a ward redesign (see Table 1b and Table D.1. Annexe D for full details).

Table 1b. Quasi-experimental studies comparing hospitals with predominantly single rooms, with hospital with mainly multiple occupancy rooms

Study	Country, time period, population, context	Intervention – isolation strategy	Intervention – additional infection prevention control measures	Comparator – isolation strategy	*C. difficile* result
Darley and others (5)	UK April 2011 to March 2016 Admitted patients (number not reported) with *C. difficile*	75% single rooms (all wards) 100% single room (intensive care unit (ICU))	None reported	10% single rooms	Rate ratio: 0.88/year (95% CI 0.81 to 0.97, p=0.01)

Study	**Country, time period, population, context**	**Intervention – isolation strategy**	**Intervention – additional infection prevention control measures**	**Comparator – isolation strategy**	***C. difficile* result**
	Hospital site move				
McDonald and others (2)	Canada January 2013 to March 2018 *C. difficile* infection patients (n=459) whose symptoms developed from 72 hours after admission up to 4 weeks post discharge Hospital site move	100% single rooms from point of admission	Contact isolation Soap and water handwashing Alcohol rinse dispensers Use of personal protective equipment (PPE) (gloves and gowns) Education sessions Audit and feedback of hand hygiene, respect of contact precautions, and glove and gown use Audits of routine and discharge cleaning with feedback Institutional antibiotic stewardship program	Single or cohorted rooms from point of diagnosis (Medical units: 20% of beds were single rooms. Surgical and oncological units, 40% of bed were single rooms. Critical care units, 65% of beds were single rooms)	*C. difficile* infections per 10,000 patient-days (unadjusted rate): Pre-intervention: 10.8 (95% CI 9.5 to 12.2) Post-intervention: 7.0 (95% CI 6.1 to 8.0) Pre-intervention incidence rate ratio (IRR): 0.99 (95% CI, 0.97 to 1.01) Post-intervention IRR: 1.00 (95% CI, 0.98 to 1.02)
Shiode and others (11)	Japan January 2013 to June 2019	51% single room	Hand hygiene sinks increased by 58% (607 to 960 sinks)	27% single rooms	Incidence rate pre-intervention: 6.14 cases per 10,000 patient days

Study	Country, time period, population, context	Intervention – isolation strategy	Intervention – additional infection prevention control measures	Comparator – isolation strategy	*C. difficile* result
	38,591 patients Hospital move				Incidence rate post-intervention: 1.17 cases per 10,000 patient days IRR at time of intervention: 0.19 (95% CI=0.15 to0.25, p=0.001) Pre-intervention coefficient**:** 0.005 (95% CI -0.053 to 0.063, p=0.85) Post- intervention: coefficient: -0.111 (95% CI -0.185 to 0.038, p=0.006)
Teltsch and others (3)	Canada 2000 to 2005 ICU patients (stool samples were tested routinely for *C. difficile* in patients with diarrhoea)	100% single rooms	Hand hygiene sinks increased by 550% (4 to 26 sinks)	ICU: 2 rooms of 12 beds, 2 private rooms	Post-intervention adjusted rate ratio: 0.57 (95% CI 0.35 to 0.93)

Darley and others (5) conducted a quasi-experimental study over a 5-year period (April 2011 to March 2016) in the UK to determine whether moving to a new-build hospital with 75% single rooms (100% in ICU) reduced *C. difficile* infection compared to the previous design with 10% single rooms. Patients were moved to the new build hospital on 19th May 2014, over a 10-day period. Rate of *C. difficile* infection showed ongoing decline over the 5-year study period (rate ratio: 0.88 per year (95% CI 0.81 to 0.97, p=0.01)). The mean number of

C. difficile cases per 100,000 bed-days decreased from 21.6 to 15.1 over the study period. There was no significant change in the rate of reduction in cases after the hospital move, and no significant shift at the time of the move. The evidence for *C. difficile* incidence (rate ratio: single rooms compared to multi-bed rooms) was rated as very low certainty. It was downgraded for risk of bias as neither patient characteristics nor treatment other than the intervention were reported. No adjustments (as part of the statistical analysis) were reported therefore the potential for confounding could not be excluded.

McDonald and others (2) conducted a quasi-experimental study over a 5-year period (January 2013 to March 2018) in Canada to determine whether moving from a 417-bed hospital with ward-type rooms to a 350-bed facility with solely single-patient rooms was associated with decreased rates of *C. difficile* infection. Patients were moved on April 26, 2015, to a new hospital with 100% single-patient rooms equipped with individual toilets and easy access to sinks for hand washing. There was no immediate change in *C. difficile* infection rates after the move (incidence rate ratio (IRR): 0.95 (95% CI 0.51 to 1.76) and no clear or meaningful change in the trend of infection rates post-move (post-intervention IRR: 1.00 (95% CI 0.98 to 1.02). Authors did note that they had observed a downward trend in *C. difficile* infection across the entire Québec province over the study period (annual IRR: 0.99 (95% CI 0.98 to 1.00). The evidence for *C. difficile* incidence (IRR: single or cohorted rooms from point of admission compared to from point of diagnosis) was rated as very low certainty. It was downgraded for risk of bias as neither patient characteristics nor treatment other than the intervention, were reported therefore the potential for confounding could not be excluded.

Shiode and others (11) conducted a quasi-experimental study over a 6.5-year period (January 2013 to June 2019) in Japan to determine whether moving to a newly built hospital with 51% private rooms (compared to 27% single-patient rooms in the old hospital) changed the incidence of *C. difficile* infection. Patients were moved in January 2016, to a new hospital with 51% single-patient rooms. The incidence of hospital onset *C. difficile* infection was 6.14 cases per 10,000 patient-days in the old hospital (322 *C. difficile* cases in 524,475 patient-days) and 1.17 cases per 10,000 patient-days in the new hospital (62 *C. difficile* cases in 531,697 patient-days). Prior to the relocation, there was no downward trend in *C. difficile* infection (coefficient: 0.005, 95% CI, 0.053 below to 0.063 above, p=0.85). After the relocation, there was a significant downward trend in *C. difficile* infection (coefficient: 0.111 below, 95% CI, 0.185 below to 0.038 below, p=0.006), with the number of cases decreasing by 11% every 3 months. At around the time of hospital relocation there was a significant 81% reduction in *C. difficile* infection cases at the new hospital (IRR: 0.19 (95% CI 0.15 to 0.25, p≤0.001). This decline continued for the 3.5 years after the relocation. The evidence for *C. difficile* incidence (IRR: 51% single rooms compared to 27% single rooms) was rated as very low certainty evidence. It was downgraded for risk of bias as neither patient characteristics nor treatment other than the intervention, were reported therefore the potential for confounding could not be excluded.

Teltsch and others (3) conducted a quasi-experimental study over a 5-year period (2000 to 2005) in Canada to assess whether changing the layout of an intensive care unit (ICU), from rooms with multiple patients to single-patient rooms, had an effect on how often patients acquired *C. difficile* infections while in the hospital. In March 2002, the ICU was moved to a new location within the hospital and had 24 beds, each in a private room containing a sink. The adjusted rate of infection of *C. difficile* decreased after intervention by 43% (rate ratio: 0.57 (95% CI 0.35 to 0.93). The evidence for *C. difficile* infection (adjusted rate ratio: single rooms compared to multibed rooms) was rated as very low certainty evidence. It was downgraded for risk of bias as neither patient characteristics nor treatment other than the intervention, were reported therefore the potential for confounding could not be excluded.

Summary of effect of hospital moves or ward redesign on *C. difficile* incidence rate

Four studies were identified that investigated whether changing to majority single-patient rooms were associated with decreased rates of *C. difficile* incidence. Three of the 4 studies reported a reduction in *C. difficile* incidence following hospital moves or ward redesigns that included changing from rooms with multiple patients to single-patient rooms. One study reported no effect. The certainty of evidence from outcomes across all studies was rated very low.

Quasi-experimental studies (outbreak contexts)

Four quasi-experimental studies were conducted as a result of C. *difficile* outbreaks (4, 8, 9, 10) and investigated isolation strategies and changes in *C. difficile* infection (see Table 1c and Table D.1. Annexe D for full details).

Table 1c. Quasi-experimental studies reporting on isolation strategies and changes in *C. difficile* infection in outbreak contexts

Study	Country, time period, population, context	Intervention – isolation strategy	Intervention – additional infection prevention control measures	Comparator – isolation strategy	*C. difficile* result
Cherifi and others (10)	Belgium September 2002 to December 2003 (outbreak	Cohorting of *C. difficile* patients in a single dedicated ward	Single medical team for cohorted patients Restriction of staff and patient	Single room isolation	Post intervention RR *C. difficile* infection: 0.31 (95% CI 0.13 to 0.77, p=0.013)

Study	Country, time period, population, context	Intervention – isolation strategy	Intervention – additional infection prevention control measures	Comparator – isolation strategy	*C. difficile* result
	period March to April 2003) Geriatric patients Outbreak patients mean age: 83 years (range, 71 to 100 years) Outbreak patients' sex: 52% female, 48% male		movement (ward transfers were avoided until the patients were asymptomatic) Reinforcement of hand hygiene with soap and hydroalcoholic solution		
Muto and others (8)	USA 1996 to 2006 (outbreak peak: June 2000) Patient characteristics not reported	Prolonged duration of isolation (contact isolation for the duration of hospitalisation)	Staff education Early case identification CDI management team Electronic flags and alerts Daily bleach cleaning Monitoring of hand hygiene Infection-control audits Targeted antimicrobial restriction	Contact isolation for duration of illness (specific length not reported)	Pre-intervention (peak outbreak) *C. difficile* infection rate: 10.4 infections per 1,000 hospital discharges Post-intervention *C. difficile* infection rate: 3.0 infections per 1,000 hospital discharges OR: 3.5 (95% CI, 2.3 to 5.4, p<.001

Study	**Country, time period, population, context**	**Intervention – isolation strategy**	**Intervention – additional infection prevention control measures**	**Comparator – isolation strategy**	***C. difficile* result**
Salgado and others (9)	USA October 2004 to May 2005 (outbreak peak: November 2004)	Placing patients with diarrhoea into isolation (single rooms) until *C. difficile* infection confirmed or ruled out If *C. difficile* infection confirmed, patient kept in isolation (single rooms) for duration of hospitalisation	Gown and glove use for healthcare workers entering CDI patient rooms Bleach-based disinfectants for cleaning equipment and environments occupied by CDI patients Mandatory handwashing with soap and water (not alcohol gel) for healthcare workers entering CDI patient rooms Electronic medical record flagging for CDI patients Hospital-wide communication via memos and targeted in-service training	Isolation after *C. difficile* infection diagnosis confirmed	Absolute decrease in *C. difficile* infection rates over the first 3 months after intervention: 2.50 per 1,000 patient-days rate decrease.
Weiss and others (4)	Canada 1 April 2002 to 31 March 2007	Cohorting of infected patients until the end of successful 14-	Dedicated housekeeping team	No cohorting	OR: 0.38 (95% CI 0.33 to 0.44, p<0.001)

Study	Country, time period, population, context	Intervention – isolation strategy	Intervention – additional infection prevention control measures	Comparator – isolation strategy	*C. difficile* result
	(outbreak period April 2003 to March 2005, peak January 2004)	day course of treatment	Gloves and gowns for healthcare workers, limited visitors Global hand hygiene programme (soap and water use for CDI cases alcohol gel restriction), installation of 85 new sinks Antibiotic stewardship Patient education Rapid diagnostic testing Increased infection control staffing		

Cherifi and others (10) conducted a quasi-experimental study in Belgium, over a 15-month period (September 2002 to December 2003), as part of a *C. difficile* outbreak (outbreak period March to April 2003). In March 2003, the detection of a *C. difficile* outbreak led to a control programme which included cohorting of infected patients in a single dedicated ward. The programme also provided a single medical and nursing team for the isolated cohort, which restricted staff movement and ward transfers were avoided until the patients were asymptomatic. The incidence of *C. difficile* infection before the outbreak was 27 cases per 100,000 patient days. The incidence of *C. difficile* infection during the outbreak period was 99 cases per 100,000 patient-days. The mean incidence in the 6 months following intervention was 31 cases per 100,000 patient-day. The risk of getting a *C. difficile* infection

6-months following intervention compared with the risk during the outbreak, when cohorting was in place, was 69% lower than during the outbreak (RR: 0.31 (95% CI 0.13 to 0.77, p=0.013). No comparison of pre-outbreak and post-outbreak *C. difficile* incidence was reported. The evidence for *C. difficile* incidence (relative risk: cohort ward compared to single room isolation) was rated as very low certainty evidence. It was downgraded for risk of bias as only patient characteristics and treatment of outbreak patients were reported, not the whole sample and therefore the potential for confounding could not be excluded.

Muto and others (8) conducted a quasi-experimental study in the USA, over a 10-year period (1996 to 2006), In June 2000, a *C. difficile* outbreak was declared in the hospital. In July 2000, in response to the outbreak, isolation was extended from the duration of *C. difficile* infection to the duration of hospitalisation. The *C. difficile* infection rate in 1999 (before the outbreak) was 2.7 infections per 1,000 hospital discharges. The peak outbreak *C. difficile* infection rate was 10.4 infections per 1,000 hospital discharges. The aggregate *C. difficile* infection rate between 2001 to 2006 decreased to 4.8 infections per 1,000 hospital discharges meaning the odds of infection were 2.2 times higher in the outbreak period compared to between 2001 and 2006. By 2006 the *C. difficile* infection rate had fallen to 3.0 infections per 1,000 hospital discharges: a 71% reduction from the outbreak peak. The evidence for *C. difficile* incidence (odds ratio: isolation for the duration of hospitalisation compared to isolation for duration of *C. difficile* illness) was rated as very low certainty evidence. It was downgraded for risk of bias as neither patient characteristics nor treatment other than the intervention, were reported therefore the potential for confounding could not be excluded.

Salgado and others (9) conducted a quasi-experimental study in the USA, over a 9-month period (October 2004 to May 2005), as part of a *C. difficile* outbreak (outbreak period November 2004). Enhanced infection control measures included placing patients with diarrhoea into isolation (single rooms) until *C. difficile* infection was confirmed or ruled out and if infection was confirmed, patients were kept in isolation (single rooms) for duration of hospitalisation. Peak *C. difficile* infection rate was 5.52 per 1,000 patient days. The mean outbreak *C. difficile* infection rate was 3.90 per 1,000 patient-days. During the first 3 months after implementing enhanced infection control measures the infection rate dropped by 2.50 infections per 1,000 patient-days (a 45.3% decrease compared to the infection rate during the outbreak). The certainty of evidence could not be assessed because the study did not report any measure of variability. Potential risks of bias identified in the study included no reporting of patient characteristics, treatment or care or follow-up.

Weiss and others (4) conducted a quasi-experimental study in Canada, over a 5-year period (1 April 2002 to 31 March 2007), as part of a *C. difficile* outbreak (outbreak period April 2003 to March 2005, peak January 2004). Several intervention strategies were implemented including cohorting of infected patients (confirmed by a positive toxin test) until the end of successful 14-day course of treatment (the non-cohorting wards were not described in detail by the study). The mean annual *C. difficile* infection rate in the pre-intervention period (2003

to 2004) was 37.28 cases per 1,000 admissions. The mean annual *C. difficile* infection rate in the post-intervention period (2006 to 2007) was 14.48 cases per 1,000 admissions. The odds of *C. difficile* infection after the intervention were 62% lower than before the intervention (OR: 0.38 (95% CI 0.33 to 0.44, p<0.001)). The evidence for *C. difficile* incidence (odds ratio: cohorting of *C. difficile* patients until the end of treatment compared to no cohorting) was rated as very low certainty evidence. It was downgraded for risk of bias as neither patient characteristics nor treatment other than the intervention, were reported therefore the potential for confounding could not be excluded. It was also downgraded for indirectness as the comparator was not clearly reported.

Summary of effect of isolation interventions in *C. difficile* outbreak contexts

Four studies were identified that assessed the effectiveness of isolation interventions in outbreak contexts. One study reported that cohorting patients with *C. difficile*, compared to non-cohorting was associated with a lower *C. difficile* infection rate. One study reported that cohorting patients with *C. difficile*, compared to single room isolation was associated with a lower *C. difficile* infection rate. The cohorting intervention also included a single medical team for the isolated cohort which limited staff and patient movement, which may explain why it was more effective than single room isolation. One study reported that contact isolation for duration of hospitalisation, compared to from the point of diagnosis was associated with a reduced *C. difficile* infection rate. One study reported that contact isolation from the point of symptom development, compared to from the point of *C. difficile* diagnosis was associated with a reduced *C. difficile* infection rate. The certainty of evidence where it could be assessed (3 studies) was rated very low. Potential risks of bias identified in other study related to incomplete reporting of patient characteristics, treatment or follow-up.

Quasi-experimental studies (endemic contexts)

Three quasi-experimental studies were conducted in endemic contexts (where *C. difficile* infections are consistently present in the hospital over time (not just during an outbreak or a short-term increase in cases) (6, 7, 12) and investigated isolation strategies and changes in *C. difficile* infection (see Table 1d and Table D.1. Annexe D for full details).

Table 1d. Quasi-experimental studies reporting on isolation strategies and changes in *C. difficile* infection in endemic contexts

Study	Country, time period, population, context	Intervention – isolation strategy	Intervention – additional infection prevention control measures	Comparator – isolation strategy	*C. difficile* result
Lee and others (12)	South Korea January 2012 to December 2022 (intervention period: April 2016 to April 2021) Confirmed healthcare facility-associated *C. difficile* infected patients	Single room isolation from date of toxin positivity to 48 h after improvement of diarrhoea	Handwashing (soap and water) for health care workers, patients, and caregivers PPE (wearing of gloves and gowns) Precaution notices outlining contact isolation protocols and hand hygiene procedures Education provided by Infection control staff Hand hygiene and PPE inspections	No isolation	Pre-intervention *C. difficile* incidence rate (IR): 38/100,000 inpatient-days) Intervention *C. difficile* IR: 45/100,000 inpatient-days) Post-intervention *C. difficile* IR: 52/100,000 inpatient-days)
Marufu and others (6)	UK 2003 to 2011 All patients aged at least 2 years.	Isolation unit	In total, 28 interventions were introduced between 2003 and 2011 (See Table D.1. Annexe D for full details).	No isolation unit	Incidence decrease following Intervention: -2.303 ($p<0.05$) Change in incidence after intervention: -2.655 ($p<0.01$)
Price and others (7)	UK 1 January 2007 to 31 March 2009 All patients testing positive for	All *C. difficile* infected patients admitted to cohort ward within 24 hours of *C.*	Dedicated cohort ward nursing staff Cohort staff wore scrubs and changed apron and gloves between each patient contact	Side room isolation for all patients with diarrhoea	Pre-intervention *C. difficile* incidence rate: 1.30 cases/1000 bed days (353 cases from

Study	Country, time period, population, context	Intervention – isolation strategy	Intervention – additional infection prevention control measures	Comparator – isolation strategy	*C. difficile* result
	C. difficile toxins A or B	*difficile* diagnosis until discharge	New antibiotic policy: cephalosporin and quinolone antibiotics replaced with aminopenicillin or antipseudomonal penicillin		82,887 admissions) Rate ratio: 0.97 (95% CI 0.94 to 1.00, p=0.04). Post-intervention *C. difficile* incidence rate: 0.69 cases/1000 bed days (258 cases 117,358 admissions) Rate ratio: 0.92 (95% CI 0.86 to 0.99, p=0.03)

Lee and others (12) conducted a quasi-experimental study in South Korea, over a 11-year period (January 2012 to December 2022) to investigate whether using single room isolation (and other infection prevention and control measures) impacted *C. difficile* infection rates. The intervention period was April 2016 to April 2021 and was triggered by a hyperendemic situation (where *C. difficile* infections were constantly present at high levels). The intervention period was suspended in April 2021 due to the restriction of isolation rooms during the COVID-19 pandemic. After the intervention was implemented, the *C. difficile* infection rate increased slightly (pre-intervention versus intervention, 38 compared to 44 cases per 100,000 inpatient-days) but was 51% lower than the predicted *C. difficile* infection rate of 91 cases per 100,000 inpatient-days: relative effect (intervention compared to predicated rate) 51% decrease (66% decrease to 35% decrease), p=0.001). After the intervention period ended, the actual *C. difficile* infection rate increased to 52 cases per 100,000 inpatient-days which was a 34% increase compared to the predicted incidence rate of 39 cases per 100,000 inpatient-days: relative effect (post-intervention compared to predicated rate) 34% (13% to 54%), p=0.001)). The certainty of evidence could not be assessed because the study did not report any measure of variability (other than comparing to predicted values), which meant the certainty of the results could not be assessed for precision. Potential risks of bias identified in the study included no reporting of patient characteristics, treatment or care or follow-up.

Marufu and others (6) conducted a quasi-experimental study in the UK, over a 9-year period (2003 to 2011). The study was a retrospective (using data collected from before the study began) time-series analysis assessing the impact of 28 interventions that aimed to reduce *C. difficile* infection rates. In January 2008 an isolation unit was implemented, at the same time a *C. difficile*-associated diarrhoea care plan and cards to document actions for each *C. difficile* infection were also introduced. At the beginning of the intervention period the incidence level was 3.1 *C. difficile* cases per 1,000 inpatient admissions There was a decrease in incidence trend following the introduction of the intervention (2.303 decrease ($p<0.05$)). The certainty of evidence could not be assessed because the study did not report any measure of variability, which meant the certainty of the results could not be assessed for precision. Potential risks of bias identified in the study included no reporting of patient characteristics, treatment or care or follow-up. Additionally, as the multiple interventions were analysed independently, information on the comparator was not clear.

Price and others (7) conducted a quasi-experimental study in the UK, over a 27-month period (1 January 2007 to 31 March 2009) to investigate the impact of opening a ward specifically for the cohorting of patients with *C. difficile* infection in response to recommendations made by the UK Department of Health Healthcare Commission after a hospital inspection in October 2007. The cohorting ward had dedicated nursing staff and was only for patients with *C. difficile* infection. All patients were looked after by one medical team and all staff wore scrubs and changed gloves and aprons between all patient contacts. Patients testing positive for *C. difficile* infection who still had on-going diarrhoea were transferred to the cohort ward on the same day. In the pre-intervention period, there were 353 cases from 82,887 admissions and the *C. difficile* incidence rate was 1.30 cases per 1,000 bed days. In the post-intervention period, there were 258 cases from 117,358 admissions and the *C. difficile* incidence rate was 0.69 cases per 1,000 bed days. The study reported that prior to the intervention, there was a significant downward trend in infections, with the number of *C. difficile* cases decreasing by 3% per month (rate ratio: 0.97 (95% CI 0.94 to 1.00, p=0.04). After the intervention, there was a significant monthly decrease of 8% in the number of *C. difficile* cases (rate ratio: 0.92 (95% CI 0.86 to 0.99, p=0.03). The evidence for *C. difficile* incidence (rate ratio: cohort ward compared to side-room isolation) was rated as very low certainty evidence. It was downgraded for risk of bias as neither patient characteristics nor treatment other than the intervention, were reported therefore the potential for confounding could not be excluded.

Summary of effect of isolation interventions in *C. difficile* endemic contexts

Three studies were identified that assessed the effectiveness of isolation interventions in endemic contexts. One study assessed the effectiveness of single room isolation compared to no isolation and reported a decrease in the *C. difficile* incidence rate when using single room isolation compared to the predicated rate. One study assessed the effectiveness of an isolation unit compared to no isolation unit and reported a reduction in *C. difficile* incidence

rate following the intervention. Potential risks of bias identified in these 2 studies related to incomplete reporting of patient characteristics, treatment or follow-up. One study assessed the effectiveness of a cohort ward compared to single room isolation and reported a reduction in *C. difficile* incidence rate following the intervention. The intervention additionally included a dedicated cohort ward nursing staff which may explain why cohorting was more effective than single room isolation. The certainty of evidence was rated very low.

Health inequalities

No evidence was identified on key demographic and social factors (socio-economic status, age, sex, race, and ethnicity) considered as of interest for this review. Isolation-based interventions to reduce *C. difficile* infections in hospital settings may inadvertently contribute to health inequalities. Patients placed in isolation may experience limited social interaction which could disproportionately affect vulnerable groups, and language or cultural differences may have created barriers that made patient or family adherence to isolation measures more difficult however specific evidence was not considered as part of this review.

Limitations

This rapid systematic review used streamlined systematic methods to accelerate the review process. Sources of evidence searched included databases of peer-reviewed and preprint research, but an extensive search of other sources was not conducted and most article screening was completed without duplication, so it is possible relevant evidence may have been missed.

The majority of the evidence identified was quasi-experimental by design and therefore did not use random assignment making it more vulnerable to other factors influencing the results such as changes over time or differences between groups.

The majority of studies reported limited patient characteristics data or treatment information and the potential for confounding could not be adequately assessed or ruled out.

Most of the evidence identified involved isolation strategies implemented alongside other interventions (such as enhanced infection control measures, infection control education, early case detection and antimicrobial stewardship) making it difficult to isolate the specific impact of isolation alone on *C. difficile* infection rates.

Most studies did not report compliance with the isolation practices, and therefore the adherence to, and the real-world applicability of the intervention, could not be fully assessed.

Some studies reported that rates of *C. difficile* infection had already declined significantly by the time of the study, potentially limiting the ability to determine if the isolation interventions were responsible for any changes in observed incidence rates and reducing the generalisability of findings to higher-incidence settings.

Most studies identified were conducted in single centres which may limit how well the findings apply to other populations or contexts.

Most studies did not screen potential asymptomatic *C difficile* carriers, and therefore may have underestimated the true *C. difficile* incidence, potentially limiting the accuracy of intervention effect estimates.

Antibiotic prescribing practices and stewardship programmes are potential confounding factors when evaluating interventions aimed at reducing *C. difficile* infection rates. Changes in antibiotic use, for example, reductions in broad-spectrum agents such as fluoroquinolones and cephalosporins could independently influence *C. difficile* incidence and therefore, any observed reduction in *C. difficile* incidence following an intervention may be partially attributable to concurrent changes in antimicrobial stewardship. Prescribing trends and policy shifts during study periods were not considered as part of this review.

Evidence gaps

Limited evidence was identified from prospective controlled studies. No evidence from care homes, adult social care settings, outpatient and community care settings, mental health facilities or prisons was identified. No evidence on *C. difficile* transmission rate or secondary *C. difficile* infection was identified.

Conclusion

This rapid systematic review examined the effectiveness of different isolation strategies for people with suspected or confirmed *C. difficile* infection to prevent transmission in settings where health and social care is given. A total of 12 studies were included comprising one prospective non-randomised study and 11 quasi-experimental studies. No evidence from randomised control trials was identified, limiting the ability to draw robust conclusions about the effectiveness of isolation interventions. Only evidence from hospital settings was identified, despite efforts to locate evidence from other relevant settings, including care homes (with or without nursing), adult social care, outpatient and community care, mental health facilities and prisons.

The findings of this evidence review suggest that isolation strategies were associated with a reduction in *C. difficile* incidence rates in hospital settings. Ten out of the 12 studies

identified suggested an isolation intervention was associated with a reduction in *C. difficile* incidence. Three studies reported that majority single-patient rooms (created as part of hospital moves or redesigns), compared to small numbers of single rooms (10 to 27%) or multi-bed rooms were associated with decreased rates of *C. difficile* incidence. Two studies (one in an outbreak context and one in an endemic context) assessed the effectiveness of a cohort ward compared to single room isolation and reported a reduction in *C. difficile* incidence following the intervention. Both the cohorting interventions also included single nursing teams and one had a dedicated medical team for the isolated cohort and may explain why cohorting was more effective than single room isolation. One study reported that cohorting patients with *C. difficile*, compared to non-cohorting was associated with a lower *C. difficile* infection rate. One study reported that maintaining isolation for the duration of hospitalisation compared to isolation for duration of *C. difficile* illness was associated with a reduced *C. difficile* infection rate. One study reported that maintaining isolation from the point of symptom development compared to from confirmation of *C. difficile* was associated with a reduced *C. difficile* infection rate. One study assessed the effectiveness of single room isolation compared to no isolation in an endemic context and reported a decrease in the *C. difficile* incidence rate compared to the predicated rate. One study assessed the effectiveness of an isolation unit compared to no isolation unit and reported a reduction in *C. difficile* incidence rate following the intervention.

The overall certainty of the evidence, where it could be assessed, was assessed as very low. Risks of bias were identified and related to limited reporting on patient characteristics, treatment and care and patient follow-up and so the conclusions of this review should be interpreted with caution.

Acknowledgments

We would like to thank colleagues within the All Hazards Public Health Response division who either reviewed or input into aspects of the review.

Disclaimer

UKHSA's rapid systematic reviews and evidence summaries aim to provide the best available evidence to decision makers in a timely and accessible way, based on published peer-reviewed scientific papers, and papers on preprint servers. Note that the reviews:

- use accelerated methods and may not be representative of the whole body of evidence publicly available
- have undergone an internal independent peer review but not an external peer review
- are only valid as of the date stated on the review

In the event that this review is shared externally, note additionally, to the greatest extent possible under any applicable law, that UKHSA accepts no liability for any claim, loss or damage arising out of, or connected with the use of, this review by the recipient or any third party including that arising or resulting from any reliance placed on, or any conclusions drawn from, the review.

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Annexe A. Protocol

Review question

The review question is:

1. What is the effectiveness of different isolation strategies for people with suspected or confirmed *Clostridioides difficile* (*C. difficile*) infection to prevent transmission in settings where health and social care is given?

A search for primary evidence to answer this review question will be conducted up to 15 May 2025.

Eligibility criteria

Table A.1. Inclusion and exclusion criteria

	Included	Excluded
Population	Adults and children (over 2 years old) with confirmed or suspected *C. difficile* [note 1]	Children under the age of 2 All animals non-human species
Context	To inform guidance for health and social care settings in cases of *C. difficile* outbreaks, clusters, periods of increased incidence or single cases	
Settings	Any setting where care [note 2] is given, including [note 3] • hospitals • care homes with or without nursing • adult social care settings • outpatient and community care settings • mental health facilities • prisons	
Intervention or exposure	Isolation strategies with or without containment strategies Isolation strategies examples: • individual side room isolation	

	Included	Excluded
	• cohorting (beds within the same bay) • *C. difficile* dedicated wards Containment strategies examples: • faecal management system • other IPC measures	
Comparator	• isolation strategies (with or without containment strategies) compared to each other • isolation strategies (with or without containment strategies) compared to no isolation strategy	Studies without a comparator
Outcomes	Onward transmission of *Clostridioides difficile* measured by: • *C. difficile* incidence rate in the healthcare setting • *C. difficile* transmission rate in the healthcare setting • secondary *C. difficile* infection	Clonal point Outbreak closure
Language	English	Any other language
Date of publication	Up to 15 May 2025	
Study design	Experimental studies including randomised-controlled trials and quasi-experimental studies Observational studies including comparative cohort studies Before-and-after studies Cross-sectional studies Case control studies	Reviews (all types) Descriptive studies including case series or case reports Modelling studies Qualitative research Mixed methods Cross-over designs
Publication type	Peer-reviewed published research Preprints	Conference abstracts Editorials Letters News articles Other grey literature

note 1 Including symptomatic PCR positive, toxin negative patients

note 2 ‘Care’ is defined here as care administered by health or social care professionals (not care of dependents)
note 3 Evidence to be presented by setting

Background

This protocol is part of a series of reviews commissioned to support the updating the Infection Prevention and Control (IPC) section of the following guideline: Clostridioides difficile infection: how to deal with the problem.

Identification of studies

The following databases will be searched for studies published up to 15 May 2025: Ovid Medline, Ovid Embase and Web of Science Preprint Citation Index, Ovid Emcare. The search strategy is presented below.

Backwards and forwards citation searching of primary studies included during full text screening will be carried out by searching Lens.org via CitationChaser. References that are included following full text screening will be used as seed references.

Screening

Title and abstract screening will be undertaken in duplicate by 2 reviewers for at least 20% of the eligible studies, with the remainder completed by one reviewer. Disagreement will be resolved by discussion or with involvement of a third reviewer where necessary.

Screening on full text will be undertaken by one reviewer and checked by a second.

Data extraction

Summary information for each study will be extracted and reported in tabular form. Information to be extracted will include country, setting, study period, study design, intervention and comparator, participants, results, and any relevant contextual data. This will be undertaken by one reviewer and checked by a second.

Risk of bias assessment

We will perform risk of bias assessment at the primary study level using the relevant JBI checklist (15). Risk of bias will be assessed by 2 reviewers independently with disagreements resolved through discussion or with a third reviewer.

Certainty of evidence

If appropriate, the certainty of evidence identified within this review will be assessed using a modified version of the Grading of Recommendations, Assessment, Development and Evaluations (GRADE) framework (13).

Certainty of evidence will be assessed at the outcome level, and be rated as one of 4 levels:

- very low (the true effect is probably different from the estimated effect)
- low (the true effect might be different from the estimated effect)
- moderate (the true effect is probably close to the estimated effect)
- high (the authors are confident that the true effect is similar to the estimated effect)

The certainty of evidence will be assessed by one reviewer (and checked by a second) for each outcome across 4 domains:

1. Risk of bias: where results may not represent the true effect because of limitations in the design or conduct of the study.
2. Inconsistency: where studies show different effects for the same outcome of interest (only assessed where there are 2 or more studies measuring the same outcome). Inconsistency will be rated down if the point estimates are not similar, or the confidence intervals do not overlap.
3. Indirectness: where elements of the study differ from the intended elements in the review question (for example, the outcome of interest has not been directly measured). This will be rated down if the population, intervention, comparator, or outcome of interest have not been directly measured.
4. Imprecision: a measure of how uncertain the estimate is. Imprecision will be rated down if the confidence intervals cross the line of no effect, or if the reviewer judges that the confidence intervals are overly wide and so the true effect is likely to be different at the upper versus the lower end of the confidence interval.

Publication bias will not be used to assess the quality of the evidence in this review.

Evidence may be downgraded one or 2 levels following the assessment of quality or upgraded if there is a large magnitude of effect or clear dose-response gradient.

Synthesis

Where studies are similar enough to combine and present data in a consistent format, a narrative synthesis will be produced to interpret the findings. The number of studies, the number of participants in each study, effect size and variance and a summary of study limitations across studies reporting each outcome will be summarised and presented. Alternatively, if studies present methodological differences that would make synthesis inappropriate, a narrative summary of each study will be provided.

Health inequalities

Variations among individuals experiencing health inequalities will be taken into account, as these factors may influence outcomes for *Clostridioides difficile* infections: socio-economic status, sex, race, and ethnicity. Differences in outcomes by age will also be assessed if the data are available.

Search strategy

Ovid MEDLINE(R) ALL (1946 to 15 May 2025)

1. exp Clostridioides difficile/ (12,188)
2. exp Clostridium Infections/ (33,851)
3. clostridium difficile.tw,kf. (15,512)
4. clostridioides difficile.tw,kf. (4,944)
5. clostridium infection*.tw,kf. (175)
6. C difficile.tw,kf. (9,707)
7. "C.difficile".tw,kf. (105)
8. C diff.tw,kf. (214)
9. "C.diff".tw,kf. (102)
10. CDAD.tw,kf. (768)
11. CDI.tw,kf. (10,143)
12. or/1-11 (48,672)
13. exp Patient Isolation/ (4,600)
14. segregat*.tw,kf. (92,966)
15. cohorting.tw,kf. (630)
16. cohort ward*.tw,kf. (30)
17. (dedicate* adj3 ward*).tw,kf. (215)
18. ((patient* or strateg* or protocol* or precaution*) adj3 isolat*).tw,kf. (71,474)
19. individual room*.tw,kf. (65)
20. side room*.tw,kf. (87)

21. single room*.tw,kf. (813)
22. en$suite*.tw,kf. (1,190)
23. Cohort bay*.tw,kf. (20)
24. Multi*-bed room*.tw,kf. (32)
25. Multibed room*.tw,kf. (19)
26. single-bed room*.tw,kf. (59)
27. multi* patient room*.tw,kf. (12)
28. single patient room*.tw,kf. (68)
29. private room*.tw,kf. (483)
30. spatial separat*.tw,kf. (2,574)
31. exp Bathroom Equipment/ (250)
32. exp Toilet Facilities/ (2,042)
33. dedicated toilet*.tw,kf. (2)
34. separate toilet*.tw,kf. (10)
35. individual toilet*.tw,kf. (11)
36. isolation facilit*.tw,kf. (391)
37. cohort area*.tw,kf. (294)
38. isolation room*.tw,kf. (679)
39. isolation area*.tw,kf. (108)
40. exp Patient Transfer/ (10,221)
41. exp "Transportation of Patients"/ (18,901)
42. (restrict* adj3 (movement or moving or transport* or transfer*) adj3 patient*).tw,kf. (166)
43. (patient* adj2 placement*).tw,kf. (4,987)
44. (movement* adj2 (patient* or polic* or strateg* or protocol* or precaution*)).tw,kf. (7,284)
45. (patient* adj2 (transfer* or transfer* or mov* or flow)).tw,kf. (32,009)
46. (fe$cal adj2 (contain* or manag* or collect* or pouch* or system*)).tw,kf. (4,006)
47. (fe$ces adj2 (contain* or manag* or collect* or pouch* or system*)).tw,kf. (2,808)
48. (stool* adj2 (contain* or manag* or collect* or pouch* or system*)).tw,kf. (3,488)
49. (bowel* adj2 (contain* or manag* or collect* or pouch* or system*)).tw,kf. (2,274)
50. (excrement adj2 (contain* or manag* or collect* or pouch* or system*)).tw,kf. (28)
51. or/13-50 (252,175)
52. 12 and 51 (1,141)
53. limit 52 to (comment or editorial or letter or news or newspaper article) (14)
54. 52 not 53 (1,127)

Embase (1974 to 15 May 2025)

1. exp Clostridioides difficile/ (22,073)
2. exp Clostridium infection/ (46,798)
3. clostridium difficile.tw,kf. (23,186)
4. clostridioides difficile.tw,kf. (6,407)
5. clostridium infection*.tw,kf. (192)
6. C difficile.tw,kf. (14,398)
7. "C.difficile".tw,kf. (502)
8. C diff.tw,kf. (1,040)
9. "C.diff".tw,kf. (360)
10. CDAD.tw,kf. (1,305)
11. CDI.tw,kf. (15,851)
12. or/1-11 (74,320)
13. exp isolation/ (13,289)
14. exp patient isolation/ (2,735)
15. segregat*.tw,kf. (106,099)
16. cohorting.tw,kf. (945)
17. cohort ward*.tw,kf. (53)
18. (dedicate* adj3 ward*).tw,kf. (401)
19. ((patient* or strateg* or protocol* or precaution*) adj3 isolat*).tw,kf. (102,357)
20. individual room*.tw,kf. (96)
21. single room*.tw,kf. (1,165)
22. side room*.tw,kf. (169)
23. en$suite*.tw,kf. (230)
24. Cohort bay*.tw,kf. (32)
25. Multi*-bed room*.tw,kf. (47)
26. Multibed room*.tw,kf. (19)
27. single-bed room*.tw,kf. (81)
28. multi* patient room*.tw,kf. (17)
29. single patient room*.tw,kf. (94)
30. private room*.tw,kf. (781)
31. spatial separat*.tw,kf. (2,453)
32. exp bathroom equipment/ (17,810)
33. exp toilet/ (1427)
34. dedicated toilet*.tw,kf. (4)
35. separate toilet*.tw,kf. (16)
36. individual toilet*.tw,kf. (17)
37. isolation facilit*.tw,kf. (483)
38. cohort area*.tw,kf. (365)
39. isolation room*.tw,kf. (1,008)
40. isolation area*.tw,kf. (157)

41. exp patient transport/ (37,254)
42. (restrict* adj3 (movement or moving or transport* or transfer*) adj3 patient*).tw,kf. (238)
43. (patient* adj2 placement*).tw,kf. (9,200)
44. (movement* adj2 (patient* or polic* or strateg* or protocol* or precaution*)).tw,kf. (10,900)
45. (patient* adj2 (transfer* or transfer* or mov* or flow)).tw,kf. (57,446)
46. (fe$cal adj2 (contain* or manag* or collect* or pouch* or system*)).tw,kf. (5,017)
47. (fe$ces adj2 (contain* or manag* or collect* or pouch* or system*)).tw,kf. (3,457)
48. (stool* adj2 (contain* or manag* or collect* or pouch* or system*)).tw,kf. (5,599)
49. (bowel* adj2 (contain* or manag* or collect* or pouch* or system*)).tw,kf. (3,681)
50. (excrement adj2 (contain* or manag* or collect* or pouch* or system*)).tw,kf. (33)
51. or/13-50 (361,084)
52. 12 and 51 (2,233)
53. limit 52 to (conference abstract or conference paper or "conference review" or editorial or letter) (788)
54. 52 not 53 (1,445)

Ovid Emcare (1995 to 15 May 2025)

1. exp Clostridioides difficile/ (1,681)
2. exp Clostridium infection/ (11,995)
3. clostridium difficile.tw,kf. (4,524)
4. clostridioides difficile.tw,kf. (1,478)
5. clostridium infection*.tw,kf. (34)
6. C difficile.tw,kf. (2,444)
7. "C.difficile".tw,kf. (49)
8. C diff.tw,kf. (109)
9. "C.diff".tw,kf. (16)
10. CDAD.tw,kf. (268)
11. CDI.tw,kf. (3,243)
12. or/1-11 (16,509)
13. exp isolation/ (5,131)
14. exp patient isolation/ (1,165)
15. exp isolation facility/ (419)
16. segregat*.tw,kf. (13,272)
17. cohorting.tw,kf. (347)
18. cohort ward*.tw,kf. (16)
19. (dedicate* adj3 ward*).tw,kf. (103)
20. ((patient* or strateg* or protocol* or precaution*) adj3 isolat*).tw,kf. (17,644)
21. individual room*.tw,kf. (32)
22. side room*.tw,kf. (35)
23. single room*.tw,kf. (455)

24. en$suite*.tw,kf. (191)
25. Cohort bay*.tw,kf. (5)
26. Multi*-bed room*.tw,kf. (25)
27. Multibed room*.tw,kf. (14)
28. single-bed room*.tw,kf. (37)
29. multi* patient room*.tw,kf. (12)
30. single patient room*.tw,kf. (47)
31. private room*.tw,kf. (336)
32. spatial separat*.tw,kf. (398)
33. exp bathroom equipment/ (5,976)
34. exp toilet/ (617)
35. dedicated toilet*.tw,kf. (1)
36. separate toilet*.tw,kf. (6)
37. individual toilet*.tw,kf. (6)
38. isolation facilit*.tw,kf. (159)
39. cohort area*.tw,kf. (120)
40. isolation room*.tw,kf. (389)
41. isolation area*.tw,kf. (45)
42. exp patient transport/ (17,556)
43. (restrict* adj3 (movement or moving or transport* or transfer*) adj3 patient*).tw,kf. (75)
44. (patient* adj2 placement*).tw,kf. (2,125)
45. (movement* adj2 (patient* or polic* or strateg* or protocol* or precaution*)).tw,kf. (3,381)
46. (patient* adj2 (transfer* or transfer* or mov* or flow)).tw,kf. (15,185)
47. exp fecal management system/ (27)
48. (fe$cal adj2 (contain* or manag* or collect* or pouch* or system*)).tw,kf. (802)
49. (fe$ces adj2 (contain* or manag* or collect* or pouch* or system*)).tw,kf. (484)
50. (stool* adj2 (contain* or manag* or collect* or pouch* or system*)).tw,kf. (955)
51. (bowel* adj2 (contain* or manag* or collect* or pouch* or system*)).tw,kf. (893)
52. (excrement adj2 (contain* or manag* or collect* or pouch* or system*)).tw,kf. (2)
53. or/13-52 (79,192)
54. 12 and 53 (549)
55. limit 54 to (conference abstract or conference paper or "conference review" or editorial or letter) (20)
56. 54 not 55 (529)

Web of Science Preprint Citation Index (1990 - search date 16 April 2025)

TS=(“Clostridioides difficile”) OR TS=(“Clostridium infection*”) OR TS=(“clostridium difficile”) OR TS=(“C diff*”) OR TS=(C.diff*) OR TS=(CDAD) OR TS=(CDI)

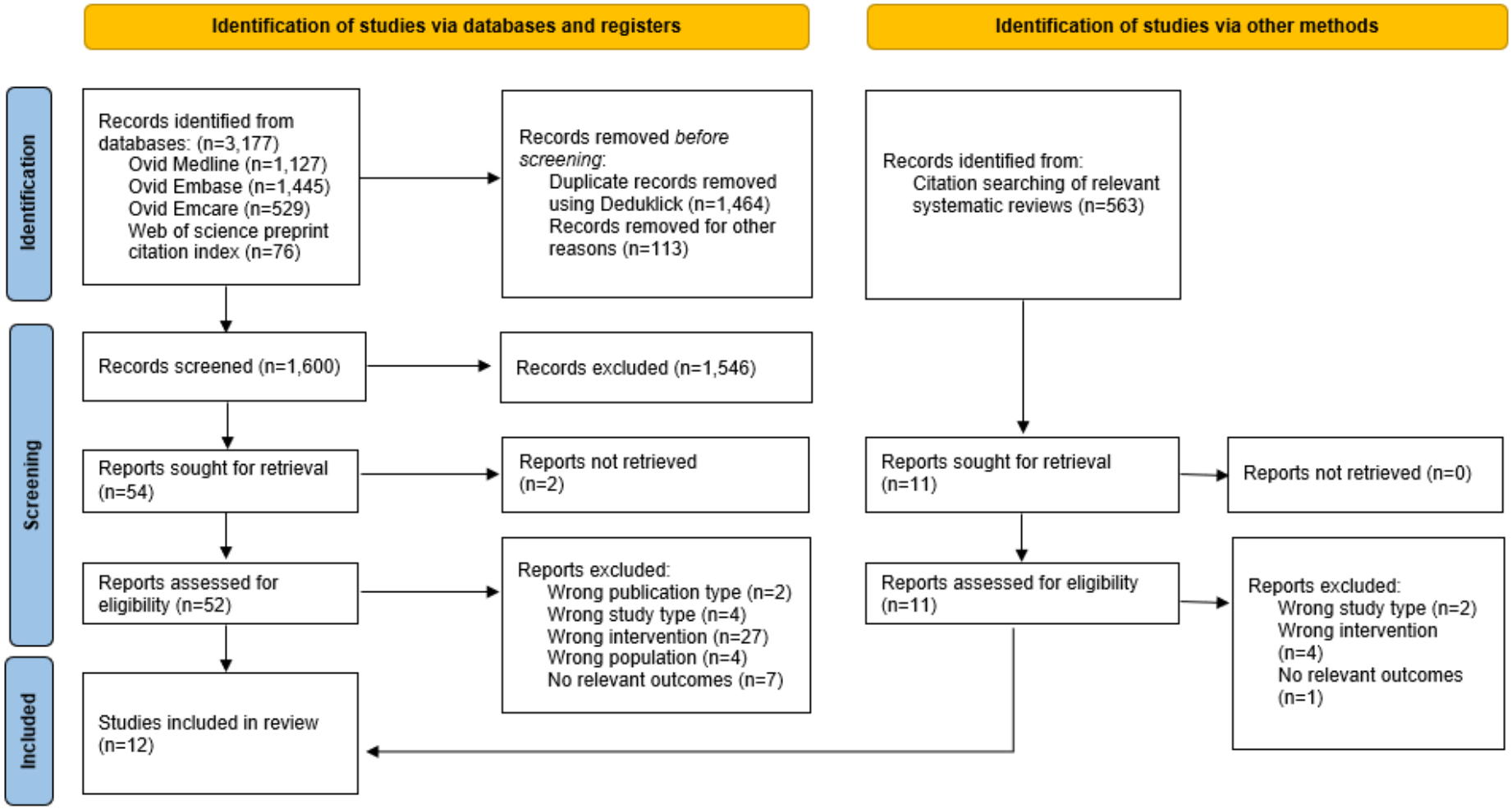
AND

TS=(isolat*) OR TS=(“patient isolation”) OR TS=(segregat*) OR TS=(cohorting) OR TS=(“cohort ward*”) OR TS=(“cohort area*”) OR TS=(“cohort bay*”) OR TS=(“individual room*”) OR TS=(“side room*”) OR TS=("single room*”) OR TS=(ensuite*) OR TS=(“Multi*-bed room*”) OR TS=(“single*-bed room*”) OR TS=(“Multi* patient room*”) OR TS=(“Single patient room*”) OR TS=(“Private room*”) OR TS=(“Spatial separat*”) OR TS=(“dedicated toilet*”) OR TS=(“separate toilet*”) OR TS=(“individual toilet*”) OR TS=(“isolation facilit*”) OR TS=(“isolation room*”) OR TS=(“isolation area*”) OR TS=(“bathroom equipment”) OR TS=(“dedicated toilet*”) OR TS=(“toilet facility*”) OR TS=(“separate* toilet*”) OR TS=(“patient trans*”) OR TS=(restrict* NEAR/3 (movement or moving or transport* or transfer*)) OR TS=(patient* NEAR/2 placement*) OR TS=(movement* NEAR/2 (patient* or polic* or strateg* or protocol* or precaution*)) OR TS=(“ fecal management system*”) OR TS=(fecal NEAR/2 (contain* or manag* or collect* or pouch* or system*)) OR TS=(feces NEAR/2 (contain* or manag* or collect* or pouch* or system*)) OR TS=(stool* NEAR/2 (contain* or manag* or collect* or pouch* or system*)) OR TS=(bowel* NEAR/2 (contain* or manag* or collect* or pouch* or system*)) OR TS=(excrement NEAR/2 (contain* or manag* or collect* or pouch* or system*))

76 Results

Annexe B. Study selection flowchart

Figure B.1. PRISMA diagram



Text version of Figure B.1. PRISMA diagram

A PRISMA diagram showing the flow of studies through this review, ultimately including 12 studies.

From identification of studies via databases and registers, n=3,177 records identified from databases:

- Ovid Medline (n=1,127)
- Ovid Embase (n=1,445)
- Ovid Emcare (n=529)
- Web of Science (n=76)

From these, records removed before screening:

- duplicate records removed using Deduklick (n=1,464)
- records removed for other reasons (n=113)

1,600 records screened, of which 1,546 were excluded, leaving 54 papers sought for retrieval, of which 2 were not retrieved.

11 studies were identified from citation searching of included studies.

Of the 63 papers assessed for eligibility, 51 reports were excluded:

- wrong publication type (n=2)
- wrong study type (n=6)
- wrong intervention (n=31)
- wrong population (n=4)
- no relevant outcomes (n=8)

12 papers were included in the review.

Annexe C. Excluded full texts

Wrong publication type (2 studies)

Ena J and others. 'Impact of strict isolation measures, surgical activity and antimicrobial use on *Clostridioides difficile* infection during COVID-19' Revista Clinica Espanola. 2023: volume 22

Rosenberg K and others. 'The Effects of Private Rooms on Hospital-Associated Infections' American Journal of Nursing 2019: volume 119, issue 11, page 53

Wrong study type (6 studies)

Gottenborg EW and others. 'Isolation Precautions in the Inpatient Setting' Hospital Medicine Clinics 2016: volume 5(1), pages 30 to 42

Quinn LK and others. 'Infection control policies and practices for Iowa long-term care facility residents with *Clostridium difficile* infection' Infection Control and Hospital Epidemiology 2007: volume 28, issue 11, pages 1,228 to 1,232

Read ME and others. 'Front-line education by infection preventionists helps reduce *Clostridioides difficile* infections' American Journal of Infection Control 2020: volume 48, issue 2, pages 227 to 229

Siani H and others. 'Best practice in healthcare environment decontamination' European Journal of Clinical Microbiology and Infectious Diseases: official publication of the European Society of Clinical Microbiology 2014: volume 34, issue 1, 45962

Siegel JD and others. '2007 Guideline for Isolation Precautions: Preventing Transmission of Infectious Agents in Health Care Settings' American Journal of Infection Control 2007: volume 35, issue 10, pages 164 to 164

Stirling B and others. 'Nurses and the control of infectious disease. Understanding epidemiology and disease transmission is vital to nursing care' Canadian Nurse 2004: volume 100, issue 9, pages 16 to 20

Wrong intervention (31 studies)

Abbett SK and others. 'Proposed checklist of hospital interventions to decrease the incidence of healthcare-associated *Clostridium difficile* infection' Infection Control and Hospital Epidemiology 2009: volume 30, issue 11, pages 1,062 to 1,069

Barbut F and others. 'Epidemiology of recurrences or reinfections of *Clostridium difficile*-associated diarrhea' Journal of Clinical Microbiology 2000: volume 38(6), pages 2,386 to 2,388

Berild D and others. '*Clostridium difficile* infections related to antibiotic use and infection control facilities in two university hospitals' Journal of Hospital Infection 2003: volume 54, issue 3, pages 202 to 206

Brakovich B and others. 'War on the spore: *Clostridium difficile* disease among patients in a long-term acute care hospital' Journal for Healthcare Quality 2013: volume 35, issue 3, pages 15 to 21

Cartmill TD and others. 'Management and control of a large outbreak of diarrhoea due to *Clostridium difficile*' Journal of Hospital Infection 1994: volume 27, issue 1, pages 1 to 15

Cheng VCC and others. 'Containment of *Clostridium difficile* infection without reduction in antimicrobial use in Hong Kong' European Journal of Clinical Microbiology and Infectious Diseases : official publication of the European Society of Clinical Microbiology 2015: volume 34, issue 7, pages 1,381 to 1,386

Cofini V and others. '*Clostridium difficile* outbreak: epidemiological surveillance, infection prevention and control' Journal of Preventive Medicine and Hygiene 2021: volume 62, issue 2, pages E514 to E519

Daneman N and others. 'The association of hospital prevention processes and patient risk factors with the risk of *Clostridium difficile* infection: a population-based cohort study' BMJ Quality and Safety 2015: volume 24, issue 7, pages 435 to 443

Debast SB and others. 'Successful combat of an outbreak due to *Clostridium difficile* PCR ribotype 027 and recognition of specific risk factors' Clinical Microbiology and Infection 2009: volume 15, issue 5, pages 427 to 434

Doll ME and others. 'Chasing the rate: An interrupted time series analysis of interventions targeting reported hospital onset *Clostridioides difficile*, 2013-2018' Infection Control and Hospital Epidemiology 2020: volume 41, issue 10, pages 1,142 to 1,147

Domeniconi G and others. '*Clostridium difficile* infection epidemiology and management: Comparison of results of a prospective study with a retrospective one in a reference teaching and research hospital in Northern Italy' American Journal of Infection Control 2016: volume 44, issue 11, pages 1,214 to 1,218

Drudy D and others. 'Emergence and control of fluoroquinolone-resistant, toxin A-negative, toxin B-positive *Clostridium difficile*' Infection Control and Hospital Epidemiology 2007: volume 28, issue 8, pages 932 to 940

Dulny G and others. 'An analysis of risk factors of *Clostridium difficile* infection in patients hospitalized in the teaching hospital in 2008' Przeglad Epidemiologiczny 2013: volume 67, issue 3, pages 445 to 450 and 547 to 551

Hardy KJ and others. 'Reducing *Clostridium difficile* through early identification of clusters and the use of a standardised set of interventions' Journal of Hospital Infection 2010: volume 75, issue 4, pages 277 to 281

Hung YP and others. 'Perceptions of Clostridium difficile infections among infection control professionals in Taiwan' Journal of Microbiology, Immunology and Infection 2017: volume 50, issue 4, pages 521 to 526

Keegan LT and others. 'Environmental and Health Care Personnel Sampling and Unobserved *Clostridium difficile* Transmission in ICU' JAMA Network Open 2025: volume 8, issue 4, e252787

Kuenzli AB and others. 'Successful management of a *Clostridioides difficile* ribotype 027 outbreak with a lean intervention bundle' Journal of Hospital Infection 2020: volume 106, issue 2, pages 240 to 245

Larson E and others. 'Impact of electronic surveillance on isolation practices' Infection Control and Hospital Epidemiology 2013: volume 34, issue 7, pages 694 to 699

Longtin Y and others. 'Effect of Detecting and Isolating Clostridium difficile Carriers at Hospital Admission on the Incidence of *C difficile* Infections: A Quasi-Experimental Controlled Study' JAMA Internal Medicine 2016: volume 176, issue 6, pages 796 to 804

Mayer J and others. 'Reinforcement of an infection control bundle targeting prevention practices for *Clostridioides difficile* in Veterans Health Administration nursing homes' American Journal of Infection Control 2019: volume 48, issue 6, pages 626 to 632

Morris KA and others. 'Impact of *Clostridium difficile* toxin gene PCR result on decisions to de-isolate patients: Do the ends justify the means?' Journal of Infection Prevention 2018: volume 19, issue 3, pages 138 to 140

Musuuza JS and others. 'Correlation of prevention practices with rates of health care-associated *Clostridioides difficile* infection' Infection Control and Hospital Epidemiology 2020: volume 41, issue 1, pages 52 to 58

Papanikolopoulou A and others. 'Association between consumption of antibiotics, infection control interventions and *Clostridioides difficile* infections: Analysis of six-year time-series data in a tertiary-care hospital in Greece' Infection, Disease & Health 2022: volume 27, issue 3, pages 119 to 128

Saint S and others. '*Clostridium Difficile* Infection in the United States: A National Study Assessing Preventive Practices Used and Perceptions of Practice Evidence' Infection Control and Hospital Epidemiology 2015: volume 36, issue 8, pages 969 to 971

Silva SY and others. 'Inpatient fluoroquinolone use in Veterans' Affairs hospitals is a predictor of *Clostridioides difficile* infection due to fluoroquinolone-resistant ribotype 027 strains' Infection Control and Hospital Epidemiology 2020: volume 42, issue 1, pages 57 to 62

Silva SY and others. 'Risk factors for *Clostridioides difficile* infection caused by ribotype 027 strains in the Veterans Affairs Healthcare System: a matched case-control study' Antimicrobial resistance and infection control 2025: volume 14, issue 1, page 53

Solanky D and others. 'Using diagnostic stewardship to reduce rates, healthcare expenditures and accurately identify cases of hospital-onset *Clostridioides difficile* infection' Infection Control and Hospital Epidemiology 2021: volume 42, issue 1, pages 51 to 56

Spagnolo AM and others. 'A *Clostridium difficile* outbreak in an Italian hospital: the efficacy of the multi-disciplinary and multifaceted approach' Journal of Preventive Medicine and Hygiene 2018: volume 59, issue 2, pages E132 to E138

Struelens MJ and others. 'Control of nosocomial transmission of *Clostridium difficile* based on sporadic case surveillance' American Journal of Medicine 1991: volume 91, issue 3B, pages 138S to 144S

Turner NA and others. 'CDC's Hospital-Onset Clostridioides difficile Prevention Framework in a Regional Hospital Network' JAMA Network Open 2024: volume 7, issue 3, e243846

Widmer AF and others. 'Transmissibility of *Clostridium difficile* Without Contact Isolation: Results From a Prospective Observational Study With 451 Patients' Clinical Infectious Diseases 2017: volume 64, issue 4, pages 393 to 400

Wrong population (4 studies)

Beaujean D and others. 'Five-year surveillance of patients with communicable diseases nursed in isolation' Journal of Hospital Infection 2001: volume 47, issue 3, pages 210 to 217

Black SR and others. 'Regional infection control assessment of antibiotic resistance knowledge and practice' Infection Control and Hospital Epidemiology 2015: volume 36, issue 4, pages 381 to 386

Kapoor R and others. 'Impact of Geographical Cohorting in the ICU: An Academic Tertiary Care Center Experience' Critical Care Explorations 2020: volume 2, issue 10, e0212

Rubin LG and others. 'Reduction in Rate of Nosocomial Respiratory Virus Infections in a Children's Hospital Associated With Enhanced Isolation Precautions' Infection Control and Hospital Epidemiology 2018: volume 39, issue 2, pages 152 to 156

No relevant outcomes (8 studies)

Dirks EE and others. 'Molecular Epidemiology, Clinical Course, and Implementation of Specific Hygiene Measures in Hospitalised Patients with *Clostridioides difficile* Infection in Brandenburg, Germany' Microorganisms 2022: volume 11, issue 1, page 22

Garcia-Lecona DA and others. 'Outcomes of *Clostridium difficile*-infected patients managed in a common isolation unit compared with isolation in their bed of diagnosis' American Journal of Infection Control 2018: volume 46, issue 1, pages 103 to 104

Gehasi;I and others. 'Comparing the impact of two contact isolation modes for hospitalised patients with *Clostridioides difficile* infection on the quality of care' Journal of Clinical Nursing 2023: volume 32, issue 5 to 6, pages 872 to 878

Gregersen M and others. 'Use of single-bed rooms may decrease the incidence of hospital-acquired infections in geriatric patients: A retrospective cohort study in Central Denmark region' Journal of Health Services Research and Policy 2021: volume 26, issue 4, pages 282 to 288

Islam J and others. 'Influence of cohorting patients with *Clostridium difficile* infection on risk of symptomatic recurrence' Journal of Hospital Infection 2013: volume 85, issue 1, pages 17 to 21

Paquet-Bolduc B and others. 'Detection and Isolation of *Clostridium difficile* Asymptomatic Carriers During *Clostridium difficile* Infection Outbreaks: An Exploratory Study' Clinical Infectious Diseases 2018: volume 67, issue 11, pages 1,781 to 1,783

Simon M and others. 'Is single room hospital accommodation associated with differences in healthcare-associated infection, falls, pressure ulcers or medication errors? A natural experiment with non-equivalent controls' Journal of Health Services and Research Policy 2016: volume 21, issue 3, pages 147 to 155

White H and others. 'A Multi-Faceted Approach of One Teaching Hospital NHS Trust during the *Clostridium difficile* Epidemic-Antibiotic Management and Beyond' Antibiotics 2016: volume 5, issue 1, page 26

Annexe D. Data extraction tables

Table D.1. Data extraction table – Quasi experimental studies

Abbreviations: CD: *clostridium difficile*, CDAD: *clostridium difficile*-associated diarrhoea, CDI: *clostridium difficile* infection, CI: confidence interval, HA-CDI: Healthcare acquired *clostridium difficile* infection, HCFA-CDI: Healthcare facility associated *clostridium difficile* infection, IPC: Infection prevention control, IR: incidence rate, IRR: Incidence rate ratio, OR: odds ratio, PPE: personal protective equipment, RR: risk ratio, SE: standard error

Study	Country, time period	Population	Context	Setting	Intervention length	Intervention – isolation strategy	Intervention – additional infection prevention control measures	Comparator – isolation strategy	Outcome - Incidence rate
Cherifi and others, 2006 (10)	Belgium, September 2002 to December 2003	Geriatric patients Outbreak patients (n=21): Mean age: 83 years (range, 71-100 years). Sex: 11 patients (52%) female 19 (90%) received 1 or more antibiotics before the onset of diarrhoea *C. difficile*-associated disease was diagnosed if *C. difficile* was detected in a stool culture. Isolates were identified on the basis of colony morphology. Isolates of *C. difficile* were typed by serogrouping and were genotyped	Outbreak	Hospital	10 months	Cohorting of infected patients in a single dedicated ward	• single medical team for cohorted patients • restriction of staff and patient movement (ward transfers were avoided until the patients were asymptomatic) • reinforcement of hand hygiene with soap and hydroalcoholic solution	• Single room isolation	• *C. difficile* incidence rate during outbreak period = 99 cases per 100,000 patient-days • mean *C. difficile* incidence rate in the 6 months following intervention = 31 cases per 100,000 patient-days • RR *C. difficile* onset = 0.31 (95% CI 0.13 to 0.77) 6 months following intervention compared with the risk during the outbreak period (p=0.013)

Study	Country, time period	Population	Context	Setting	Intervention length	Intervention – isolation strategy	Intervention – additional infection prevention control measures	Comparator – isolation strategy	Outcome - Incidence rate
		using pulsed-field gel electrophoresis							
Darley and others, 2018 (5)	UK, April 2011 to March 2016	Admitted patients (number not reported) with *C. difficile* Healthcare-associated *C. difficile* cases were defined as those that were identified from samples submitted 3 days after the date of patient admission (specific diagnosis method not reported)	Hospital move	Hospital	22 months	75% single rooms in all wards 100% single rooms in ICU	None reported	10% single rooms	Rates of HA-CDI infection over the five-year study period: • rate ratio = 0.88 per year (95% CI 0.81 to 0.97, P=0.01) • mean number of cases per 100,000 bed-days decreased from 21.6 to 15.1 no significant change in the rate of reduction in cases after the move, and no step change at the time of the move
Ellison and others, 2014 (1)	Canada, June 2007 to February 2010	General medical patients (n=1,687) admitted to the general internal medicine service from the emergency room, urgent assessment clinic or the community Mean age: 60.6 years (SD: 18.4) Sex: 55.3% male Hospital-acquired *C. difficile* infection was based on the definitions used by the Public Health Agency of Canada	New ward design	Hospital	33 months	More than 80% single bedrooms with private bathrooms (Random allocation was not possible in the setting of high bed occupancy and the need to maintain patient flow through the emergency room. Authors reported that a 2:1 patient allocation plan, that incorporated randomness, was used with investigator	• private bathrooms • hand-washing sink per room • hallway handwashing sink between each room	More than 80% four-bed rooms with shared bathrooms	• incidence rate (per 1000 patient-days) new design= 1.16 • incidence rate (per 1000 patient-days) historic design= 0.84 (p=0.57)

Study	Country, time period	Population	Context	Setting	Intervention length	Intervention – isolation strategy	Intervention – additional infection prevention control measures	Comparator – isolation strategy	Outcome - Incidence rate
		(occurring more than 72 hours after admission)				blinded ascertainment of outcomes)			
Lee and others, 2023 (12)	South Korea, January 2012 to December 2022	Confirmed healthcare facility-associated *C. difficile* infected patients An episode of *C. difficile* was defined based on the Clinical practice guidelines by the infectious diseases society of America (IDSA) and society for healthcare epidemiology (2017 update). The toxigenic *C. difficile* strain was determined from polymerase chain reaction-based detection of toxin genes	Endemic	Hospital	61 months (Pre-intervention = 51 months Post-intervention = 20 months)	Single room isolation Isolation from date of toxin positivity to 48 hours after improvement of diarrhoea	• handwashing (soap and water) for health care workers, patients, and caregivers • PPE (wearing of gloves and gowns) • precaution notices outlining contact isolation protocols and hand hygiene procedures posted on *C. difficile* isolation rooms • infection control staff provided handwashing education (soap and water) before patient contact and after glove removal • on-site inspection on correct hand hygiene and PPE	No isolation	Pre- intervention vs. intervention: • HCFA-CDI IR increased (38 vs. 45/100,000 inpatient-days) (predicted IR (91/100,000 inpatient-days, -51 [-66 to -35] %, p=0.001) Post-intervention vs. intervention: • HCFA-CDI IR increased (52/100,000 inpatient-days) (predicted IR (39/100,000 inpatient-days, 34 (13 to 54) %, p=0.001)
Marufu and others, 2014 (6)	UK, 2003 to 2011	All patients aged ≥2 years. All grades of infection (mild,	Period of increase prevalence Outbreak	Hospital	108 months (9 years)	Isolation unit	28 interventions were introduced across the study period: • medical microbiologist led antibiotic rounds	No isolation unit	• baseline Incidence Level: 3.1 *C. difficile* cases/1000 inpatient admissions

Study	Country, time period	Population	Context	Setting	Intervention length	Intervention – isolation strategy	Intervention – additional infection prevention control measures	Comparator – isolation strategy	Outcome - Incidence rate
		moderate, severe, complicated) including toxic mega-colon or ileus where the stool specimen was C. difficile toxin (A or B) positive including postmortem samples. Patients diagnosed with pseudo-membranous colitis revealed by lower gastrointestinal endoscopy or computed tomography (without a positive *C. difficile* toxin stool sample) in whom colonic histopathology was characteristic of CDI on a specimen obtained during endoscopy, colectomy, or postmortem, with or without a concurrent stool sample positive for *C. difficile* toxin	Endemic with declining rates				(adult and neonatal intensive care, haematology) • infection control performance scorecards for clinical groups • hypochlorite (Chlor-clean) for all equipment and environment • mandatory infection control training for consultants • infection control strategy group • 'Cleanyourhands' campaign implemented • strategy group for cleaning of near-patient equipment • executive lead: director of infection prevention and control • antibiotic-resistant organism (and CDI) feedback programme to all medical specialties • 'Saving Lives' infection control audit toolkit introduced • microbiologist led antibiotic rounds on geriatric wards • infection control clinical leads group • restrictive antibiotic policy introduced		• incidence trend prior to Intervention: 1.423 • incidence decrease following intervention: -2.303 ($p<0.05$) • change in *C. difficile* incidence after intervention: -2.655 ($p<0.01$)

Study	Country, time period	Population	Context	Setting	Intervention length	Intervention – isolation strategy	Intervention – additional infection prevention control measures	Comparator – isolation strategy	Outcome - Incidence rate
							• UK Health Act 2006: Code of Practice for the Prevention & Control of HCAIs • external audit of infection control and cleaning • disposable bedpans and macerators introduced • antimicrobial pharmacist appointed • trust infection control governance policy implemented • infection control strategy and performance committee formed • isolation unit and *C. difficile*-associated diarrhoea care plan and action cards introduced to document actions for each CDI • Department of Health *C. difficile* target introduced • deputy director of infection prevention and control appointed • new mattresses following regulatory authority visit • new director of nursing with responsibility for HCAI • CDI ward rounds introduced		

Study	Country, time period	Population	Context	Setting	Intervention length	Intervention – isolation strategy	Intervention – additional infection prevention control measures	Comparator – isolation strategy	Outcome - Incidence rate
							• new antibiotic stewardship audits introduced • CDI review meetings introduced • infection control performance scorecards re-launched		
McDonald and others, 2019 (2)	Canada, January 2013 to March 2018	Patients admitted to a tertiary/quaternary care (advanced medical investigation and treatment) adult hospital *C. difficile* testing was done in patients with at least 3 liquid stools over 24 hours or for those with toxic megacolon Healthcare acquired *C. difficile infection* was defined as per the provincial definition and included patients whose symptoms developed from 72 hours after admission up to 4 weeks post discharge Diagnosis was via direct stool	Hospital move	Hospital	36 months	Single patient rooms from point of admission	• hydrogen peroxide vapor for discharge cleaning during local outbreaks of CDI	Single patient room from the point of CDI diagnosis On medical units, 80% of the rooms were multibed and 20% were private On surgical and oncological units, 60% of the rooms were multibed and 40% were private On critical care units, 35% of the rooms were multiple occupancy and 65% were private	Before intervention: Mean unadjusted rate: 10.8 per 10,000 patient days (95% CI 9.5 to 12.2) After intervention: Mean unadjusted rate 7.0 per 10,000 patient days (95% CI 6.1 to 8.0) No immediate-level change IRR = 0.95 (95% CI = 0.51 to 1.76) No statistically significant pre- or post-intervention temporal trends • pre-intervention: IRR = 0.99 (95% CI = 0.97 to 1.01) • post-intervention: IRR = 1.00 (95% CI = 0.98 to 1.02)

Study	Country, time period	Population	Context	Setting	Intervention length	Intervention – isolation strategy	Intervention – additional infection prevention control measures	Comparator – isolation strategy	Outcome - Incidence rate
		polymerase chain reaction							
Muto and others, 2007 (8)	USA, 1996 to 2006	Patients admitted to a tertiary care teaching facility (provides specialised medical care and is affiliated with a medical school for training healthcare professionals)	Outbreak	Hospital	66 months	Prolonged duration of isolation (contact isolation for the duration of hospitalisation)	• education (delivered via meetings and on electronic platforms) on *C. difficile* epidemiology, risk factors, clinical signs, epidemic strain, and control measures • early Case Identification: Nurses authorised to order *C. difficile* Electronic markers used to flag high-risk patients Email alerts sent to physicians to prompt testing • CDI Management Team: Infectious disease clinicians reviewed all toxin-positive cases in near real time • expanded infection control measures Electronic flags to prevent room sharing with non-CD patients Daily bleach cleaning of high-touch surfaces (concentration increased over time) Monitoring of isolation compliance and hand hygiene with soap and water	Contact isolation for duration of illness (specific length not reported)	• CDI infection rate 1999: 2.7 infections per 1,000 hospital-discharges • CDI infection rate June 2000: 10.4 infections per 1,000 hospital-discharges • CDI infection rate 2001: 5.6 infections per 1,000 hospital-discharges • CDI aggregate infection rate 2001–2006: 4.8 infections per 1,000 hospital-discharges (0.77 infections per 1,000 patient-days; OR = 2.2 (95% CI 1.4 to 3.1, p<0.001)) • CDI infection rate 2006: 3.0 infections per 1,000 hospital-discharges (OR = 3.5 (95% CI 2.3 to 5.4, p <0.001))

Study	Country, time period	Population	Context	Setting	Intervention length	Intervention – isolation strategy	Intervention – additional infection prevention control measures	Comparator – isolation strategy	Outcome - Incidence rate
							• real-Time Alerts (lab system-generated notifications sent to care teams) • infection-control audits • targeted Antimicrobial Stewardship		
Price and others, 2010 (7)	UK, January 1, 2007 to March 31, 2009	All in-patients (teaching hospital) with a positive diarrhoeal stool test for *C. difficile* toxin more than 72 h after admission	Endemic	Hospital	27 months	All CDI infected patients admitted to CDI cohort ward within 24 hours of CDI diagnosis until discharge	• cohort nursing • cohort staff wore scrubs and changed apron and gloves between each patient contact • new antibiotic policy: cephalosporin and quinolone antibiotics replaced with aminopenicillin or antipseudomonal penicillins	All patients with diarrhoea to go into side-rooms, with standard isolation	Pre intervention phase: • number of CDI cases = 353 from 82887 admissions • incidence rate = 1.30 cases per 1000 bed days Post-intervention phase: • number of CDI cases= 258 from 117358 admissions • incidence rate= 0.69 cases per 1000 bed days Poisson regression analysis: • pre intervention: decrease in number of cases by 3% per month [multiplicative factor of exp (-0.032) = 0.97 per month (p value= 0.04, 95% CI= 0.94 to 1.00)] • post intervention: decrease in number of cases by 8% per month (multiplicative decrease per month was exp (-0.032) x exp (-0.047) = 0.92 (p value= 0.03, 95% CI= 0.86 to 0.99). The goodness of fit of the model was adequate (X2 = 31.5, p value: 0.11)
Salgado and others, 2009 (9)	USA, October 2004 to May 2005	All patients admitted to a tertiary care and academic institution	Outbreak	Hospital	6 months	Placing patients with diarrhoea into isolation	• mandatory handwashing with soap and water (not alcohol	Isolation after CDI diagnosis confirmed	• the overall mean outbreak CDI rate = 3.90 per 1000 patient-day

Study	Country, time period	Population	Context	Setting	Intervention length	Intervention – isolation strategy	Intervention – additional infection prevention control measures	Comparator – isolation strategy	Outcome - Incidence rate
		hospital (total outbreak cases=307) *C. difficile* cases were defined as any patient with a positive *C. difficile* toxin A or B test in the setting of diarrhoea that developed after 72 hours of admission or was present on admission if the patient had been hospitalised within the previous 30 days				(single rooms) until CDI confirmed or ruled out Patient kept in isolation (single rooms) for duration of hospitalisation after CDI confirmation	gel) for healthcare workers caring for CDI patients • gown and glove use required for healthcare workers entering CDI patient rooms • bleach-based disinfectants for cleaning equipment and environments occupied by CDI patients • electronic medical record flagging for CDI patients to ensure precautions on readmission • hospital-wide communication via memos and targeted in-service training in high-incidence areas		• peak outbreak CDI rate (November 2004) = 5.52 per 1000 patient days • absolute decrease in CDI rates over the first 3 months after implementing EICM = 2.50 per 1000 patient-days rate decrease (relative 45.3% decrease) • immediate post outbreak CDI rate = 1.84 per 1000 patient-days • mean post outbreak rate (maintained for 36 months beyond the outbreak) = 1.24 per 1000 patient-days
Shiode and others, 2022 (11)	Japan, January 1, 2013 to June 30, 2019	Patients aged 18 or older hospitalised for 72 hours or more *C. difficile* infection case was defined as diarrhoea occurring ≥3 times a day or the presence of a toxic megacolon and stool samples testing positive for *C. difficile* toxins	Hospital move	Hospital	42 months (3.5 years)	51% private rooms (n=277)	• hand hygiene sinks increased by 58% (607 to 960 sinks)	27% private rooms (n=148)	• incidence before intervention (3 years): 6.14 cases per 10,000 patient days • incidence after intervention (3.5 years): 1.17 cases per 10,000 patient days • before intervention: no downward trend (Coef. 0.005, 95% CI -0.053 to 0.063, p=0.85) • after intervention: significant downward trend (Coef. -0.111, 95% CI -0.185 to 0.038, P = 0.006), with the number of cases decreasing by 11% every 3 months

Study	Country, time period	Population	Context	Setting	Intervention length	Intervention – isolation strategy	Intervention – additional infection prevention control measures	Comparator – isolation strategy	Outcome - Incidence rate
									Poisson regression analysis: • IRR = 0.19 (95% CI = 0.15-0.25, P = 0.001) around the time of hospital move, indicating a significant 81% reduction in HO-CDI cases at the new hospital • this decline was not transient but continued for at least 3.5 years after the relocation
Teltsch and others, 2011 (3)	Canada, 2000 to 2005	ICU patients (general hospital) Mean age before intervention: 59.6 years Mean age after intervention: 59.4 years Female sex before intervention: n=973 (35.6%) Female sex after intervention: n=1874 (34.3%) *C. difficile* was diagnosed through microbiologic testing (of all patients) more than 48 hours after ICU admission	Ward redesign	Hospital	72 months (6 years)	100% single rooms	• hand hygiene sinks increased by 550% (4 to 26 sinks)	Pre-intervention ICU: 2 rooms of 12 beds, 2 private rooms	• rate ratio after intervention: 0.57 (95% CI 0.35-0.93)
Weiss and others, 2009 (4)	Canada, April 1, 2002 to March 31, 2007	Patients admitted to an acute care tertiary teaching hospital	Outbreak	Hospital	24 months	Cohorting of infected patients (with a positive toxin test) until the end of successful	• dedicated housekeeping team: Special training in CDI cleaning protocols	No cohorting	Pre intervention (2003 to 2004): • number of *C. difficile* cases=762 • mean annual rate=37.28 cases per 1,000 admissions

Study	Country, time period	Population	Context	Setting	Intervention length	Intervention – isolation strategy	Intervention – additional infection prevention control measures	Comparator – isolation strategy	Outcome - Incidence rate
		A case of *C. difficile* was considered hospital acquired if a patient had an episode of CDI more than 72 hours after admission or within 10 weeks of their hospital discharge if readmitted				14-day course of treatment	Daily cleaning of patient rooms and common areas Use of bleach solutions (1:50 for general cleaning; 1:10 for bathrooms) • enhanced contact precautions: Gloves and gowns for healthcare workers Handwashing with soap and water (no alcohol gel) Limited visitors (1 per patient) • antibiotic stewardship: Distribution of evidence-based guidelines to all physicians and trainees • patient education: CDI-specific information sheets provided on admission Emphasis on hand hygiene • rapid diagnostic testing: Enzyme immunoassay performed on first liquid stool sample Testing conducted three times daily • infection control staffing: Four new infection control practitioners hired		Post-intervention (2006 to 2007) • number of *C. difficile* cases=292 • mean annual rate=14.48 cases per 1,000 admissions OR: 0.379 (95% CI = 0.331 to 0.435, p<0.001)

Study	Country, time period	Population	Context	Setting	Intervention length	Intervention – isolation strategy	Intervention – additional infection prevention control measures	Comparator – isolation strategy	Outcome - Incidence rate
							Hospital-wide CDI education sessions Targeted ward-level education for high-incidence areas • global hand hygiene programme Promotion of soap and water use for CDI cases Installation of 85 new sinks in common areas Alcohol gel restriction (healthcare workers instructed not to use alcohol-based hand rubs for CDI care)		

Annexe E. Risk of bias assessment

Table E.1. Risk of bias assessment of Quasi-experimental studies

Study	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Notes
Darley and others, 2018 (5)	Yes	Unclear	Unclear	Yes	Yes	Unclear	Yes	Yes	Yes	Q2: Patient characteristics not reported Q3: Treatment or care information not reported Q6: Follow-up not reported
Ellison and others, 2014 (1)	Yes	No	No	Yes	Yes	Unclear	Yes	Yes	Yes	Q2: Patients admitted to the new design ward were younger, had significantly fewer comorbidities Q3: Participants were not receiving similar treatment Q6: Follow-up not reported
Lee and others, 2023 (12)	Yes	Unclear	Unclear	Yes	Yes	Unclear	Yes	Yes	Yes	Q2: Patient characteristics not reported Q3: Treatment or care information not reported Q6: Follow-up not reported
Marufu and others, 2014 (6)	Yes	Unclear	Unclear	Unclear	Yes	Unclear	Yes	Yes	Yes	Q2: Patient characteristics not reported Q3: Treatment not reported Q4: Interventions analysed independently; control unclear Q6: Follow up not reported
McDonald and others, 2019 (2)	Yes	Unclear	Unclear	Yes	Yes	Unclear	Yes	Yes	Yes	Q2: Patient characteristics not reported Q3: Treatment or care information not reported Q6: Follow-up not reported
Muto and others, 2007 (8)	Yes	Unclear	Unclear	Yes	Yes	Unclear	Yes	Yes	Yes	Q2: Patient characteristics not reported Q3: Treatment or care information not reported Q6: Follow-up not reported
Price and others, 2010 (7)	Yes	Unclear	Unclear	Yes	Yes	Unclear	Yes	Yes	Yes	Q2: Patient characteristics not reported Q3: Treatment or care information not reported Q6: Follow-up not reported
Salgado and others, 2009 (9)	Yes	Unclear	Unclear	Yes	Yes	Unclear	Yes	Yes	Yes	Q2: Patient characteristics not reported Q3: Treatment or care information not reported Q6: Follow-up not reported
Shiode and others, 2022 (11)	Yes	Unclear	No	Yes	Yes	Yes	Yes	Yes	Yes	Q2: Limited patient characteristics data Q3: Differences in treatments between control and intervention group
Teltsch and others, 2011 (3)	Yes	Unclear	Unclear	Yes	Yes	Unclear	Yes	Yes	Yes	Q2: No statistical analysis reported Q3: Patient treatment not reported Q6: Follow up not reported

Study	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Notes
Weiss and others, 2009 (4)	Yes	Unclear	Unclear	Yes	Yes	Unclear	Yes	Yes	Yes	Q2: Patient characteristics not reported Q3: Treatment or care information not reported Q6: Follow-up not reported

Critical appraisal was done using the JBI checklist for Quasi experimental studies (14).

Q1: Is it clear in the study what is the 'cause' and what is the 'effect' (that is, there is no confusion about which variable comes first)?
Q2: Were the participants included in any comparisons similar?
Q3: Were the participants included in any comparisons receiving similar treatment/care, other than the exposure or intervention of interest?
Q4: Was there a control group?
Q5: Were there multiple measurements of the outcome both pre and post the intervention/exposure?
Q6: Was follow up complete and if not, were differences between groups in terms of their follow up adequately described and analysed?
Q7: Were the outcomes of participants included in any comparisons measured in the same way?
Q8: Were outcomes measured in a reliable way?
Q9: Was appropriate statistical analysis used?

Annexe F. GRADE assessment of certainty of evidence

Abbreviations: CI: confidence interval, IRR: incidence rate ratio, OR: odds ratio, RR: relative risk

Table F.1. *C. difficile* incidence (rate ratio: single rooms compared to multi-bed rooms)

Certainty assessment							Effect	Certainty
Number of studies and endnote reference	**Study design**	**Risk of bias**	**Inconsistency**	**Indirectness**	**Imprecision**	**Other considerations**	**Effect estimate (95% CI)**	
1 Darley and others, 2018 (5)	Quasi-experimental	Serious [note 1]	Not assessed [note 2]	Not serious	Not serious	None	Rate ratio: 0.88/year (95% CI 0.81 to 0.97, p=0.01)	⨁◯◯◯ Very low

Explanations

[note 1] Study was potentially at risk of bias as patient characteristics and treatment/care, other than the intervention, was not reported. Adjustments not reported and therefore potential for confounding cannot be excluded.
[note 2] Only one study, not possible to assess inconsistency.

Table F.2. *C. difficile* incidence (IRR: single or cohorted rooms from point of admission compared to from point of diagnosis)

Certainty assessment							Effect	Certainty
Number of studies and endnote reference	**Study design**	**Risk of bias**	**Inconsistency**	**Indirectness**	**Imprecision**	**Other considerations**	**Effect estimate (95% CI)**	
1 McDonald and others, 2019 (2)	Quasi-experimental	Serious [note 1]	Not assessed [note 2]	Not serious	Not serious	None	IRR: 1.00 (95% CI, 0.98 to 1.02)	⨁◯◯◯ Very low

Explanations

[note 1] Study was potentially at risk of bias as patient characteristics and treatment/care, other than the intervention, was not reported.
[note 2] Only one study, not possible to assess inconsistency.

Table F.3. *C. difficile* incidence (IRR: 51% single rooms compared to 27% single rooms)

Certainty assessment							Effect	Certainty
Number of studies and endnote reference	**Study design**	**Risk of bias**	**Inconsistency**	**Indirectness**	**Imprecision**	**Other considerations**	**Effect estimate (95% CI)**	
1 Shiode and others (11)	Quasi-experimental	Serious [note 1]	Not assessed [note 2]	Not serious	Not serious	None	IRR: 0.19 (95% CI=0.15 to 0.25, P=0.001)	⨁◯◯◯ Very low

Explanations

[note 1] Study was potentially at risk of bias as patient characteristics were not reported and statistical differences in treatment/care, other than the intervention, were reported and therefore potential for confounding cannot be excluded.
[note 2] Only one study, not possible to assess inconsistency.

Table F.4. *C. difficile* incidence (rate ratio: single rooms compared to multibed rooms)

Certainty assessment							Effect	Certainty
Number of studies and endnote reference	**Study design**	**Risk of bias**	**Inconsistency**	**Indirectness**	**Imprecision**	**Other considerations**	**Effect estimate (95% CI)**	
1 Teltsch and others, 2011 (3)	Quasi-experimental	Serious [note 1]	Not assessed [note 2]	Not serious	Not serious	None	Adjusted rate ratio: 0.57 (95% CI 0.35 to 0.93)	⨁◯◯◯ Very low

Explanations

[note 1] Study was potentially at risk of bias as patient characteristics and treatment/care, other than the intervention, was not reported.
[note 2] Only one study, not possible to assess inconsistency.

Table F.5. *C. difficile* incidence (relative risk: cohort ward compared to single room isolation)

Certainty assessment							Effect	Certainty
Number of studies and endnote reference	**Study design**	**Risk of bias**	**Inconsistency**	**Indirectness**	**Imprecision**	**Other considerations**	**Effect estimate (95% CI)**	
1 Cherifi and others, 2006 (10)	Quasi-experimental	Serious [note 1]	Not assessed [note 2]	Not serious	Not serious	None	RR: 0.31 (95% CI 0.13 to 0.77, p=0.013)	⨁◯◯◯ Very low

Explanations

[note 1] Study was potentially at risk of bias as only patient characteristics and treatment of outbreak patients reported, not whole sample.
[note 2] Only one study, not possible to assess inconsistency

Table F.6. *C. difficile* incidence (odds ratio: isolation for the duration of hospitalisation compared to isolation for duration of *C. difficile* illness)

Certainty assessment							Effect	Certainty
Number of studies and endnote reference	**Study design**	**Risk of bias**	**Inconsistency**	**Indirectness**	**Imprecision**	**Other considerations**	**Effect estimate (95% CI)**	
1 Muto and others, 2007 (8)	Quasi-experimental	Serious [note 1]	Not assessed [note 2]	Not serious	Not serious	None	OR: 3.5 (95% CI, 2.3 to 5.4, p<.001)	⨁◯◯◯ Very low

Explanations

[note 1] Study was potentially at risk of bias as patient characteristics and treatment/care, other than the intervention, was not reported.
[note 2] Only one study, not possible to assess inconsistency

Table F.7. *C. difficile* incidence (odds ratio: cohorting of *C. difficile* patients until the end of treatment)

Certainty assessment							Effect	Certainty
Number of studies and endnote reference	**Study design**	**Risk of bias**	**Inconsistency**	**Indirectness**	**Imprecision**	**Other considerations**	**Effect estimate (95% CI)**	
1 Weiss and others, 2009 (4)	Quasi-experimental	Serious [note 1]	Not assessed [note 2]	Serious [note 3]	Not serious	None	OR: 0.38 (95% CI 0.33 to 0.44, p<0.001)	⨁◯◯◯ Very low

Explanations

[note 1] Study was potentially at risk of bias as patient characteristics and treatment/care, other than the intervention, was not reported.
[note 2] Only one study, not possible to assess inconsistency
[note 3] Comparator not clearly reported

Table F.8. *C. difficile* incidence (rate ratio: cohort ward compared to side-room isolation)

Certainty assessment							Effect	Certainty
Number of studies and endnote reference	**Study design**	**Risk of bias**	**Inconsistency**	**Indirectness**	**Imprecision**	**Other considerations**	**Effect estimate (95% CI)**	
1 Price and others, 2010 (7)	Quasi-experimental	Serious [note 1]	Not assessed [note 2]	Not serious	Not serious	None	Rate ratio: 0.92 (95% CI 0.86 to 0.99, p=0.03)	⨁◯◯◯ Very low

Explanations

[note 1] Study was potentially at risk of bias as patient characteristics and treatment/care, other than the intervention, was not reported.
[note 2] Only one study, not possible to assess inconsistency

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Prepared by Susannah Brown, Maheen Quershi, Jodie Walker, Jennifer Hill and Serena Carville.

For queries relating to this document, contact: enquiries@ukhsa.gov.uk

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