Australian Government
National Health and Medical Research Council

BUILDING
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AUSTRALIA

NHMRC

STAYING HEALTHY IN CHILDHOOD

Scoping Review Report

August 2021

01 |

Background

- Overview of project and PICO
- Literature search terms
- Inclusion and exclusion criteria

02 |

Scoping the evidence

- Literature search results
- Common reasons for exclusion
- Limitations

03 |

Mapping the evidence

- Interventions and outcomes
- Mapping studies
- Study design and region

04 |

Findings and gaps

- Overview
- Evidence & gaps
- Future direction

00

Executive summary

HEALTH TECHNOLOGY ANALYSTS

01 | Background

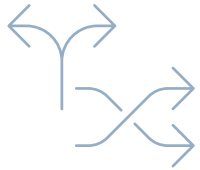
The purpose of this scoping review was to ascertain the volume and type of evidence relating to the prevention, control and management of infectious diseases in early childhood education and care services.

PICO

Population: infant, children and adults
Setting: early childhood education and service centres
Intervention: range of measures used for the prevention and control of infectious diseases
Comparator: any comparator
Outcome: any outcome

Literature search

A **broad literature search** was created using **various Mesh terms** and **keywords** to capture evidence related to the prevention, control & management of childhood infectious diseases



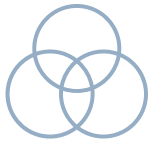
Criteria

Studies were **included** if they reported on **prevention and control measures** to reduce or manage infectious diseases in childcare settings.
Studies were **excluded** for reasons including **treatment**, epidemiology of disease, **associated risks** with childcare attendance, etc.

Search terms were created to capture evidence relevant to the prevention and management of infectious disease in childcare settings.

02 | Scoping the evidence

Broad literature search terms identified a large volume of studies. Most studies did not meet elements of the PICO and inclusion criteria and were therefore excluded.



Search results

Initial search results yielded 5,700+ studies. After removing duplicates, 4,400+ studies were assessed at title abstract. A total of **462 studies were included in the evidence map**. These studies addressed the PICO, inclusion and exclusion criteria.

Main reasons for exclusion

The main reasons for exclusion included **hospital and community settings**, assessing **treatment** interventions, **associated risks** of attending childcare, **communicable diseases** and **environmental exposures**.

Limitations

Not all studies provided adequate details at title/abstract to confidently determine the intervention and outcome. Where information was limited, studies were often classified broadly. If study details were not clear, studies were often classified as "*Grey*" literature. As a result, **some study designs, interventions and outcomes may be overrepresented**.

The literature search returned many studies relevant to the prevention and management of infectious diseases in the childcare setting.

03 | Mapping the evidence

To map the evidence, studies were mapped to the various characteristics addressed in the title/abstract. Characteristics included intervention/s, outcome/s, study design and region.

Interventions and outcome

Interventions and outcomes were **determined based on the information within the title and abstract**.
In some instances, topics are broad and encompass an array of studies, others are more specific.
Where possible, topics were aligned with those in the *Staying Healthy* Guidelines.

Mapping evidence

Studies were mapped based on the interventions and outcomes addressed in the title and abstract.
This approach means that **one study may be represented across various interventions and/or outcomes**.

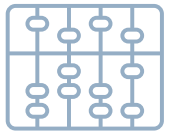
Additional characteristics

Studies were also mapped according to the study design and study region. Where possible studies were mapped with specific populations, including pregnancy.

Studies addressing a range of interventions and outcomes were represented multiple times in the evidence map.

04 | Findings and gaps

The evidence map provides an insight into where there is evidence and where there are gaps in evidence. Much of the evidence is internationally based and of lower quality, and no new concepts were identified.



Evidence

Most of the evidence was in **hand hygiene and education** (interventions) and **behaviour, pathogens and rates of transmission** (outcomes).
Many studies were vague and broadly categorised to management (intervention) and prevention (outcome).
No new concepts were identified through the scoping review.

Gaps

Based on the current *Staying Healthy* Guidelines, there were gaps in evidence for **various topics including food safety, spills, environmental sustainability** (e.g., reusable or disposable), and **celebration and cooking with children**.

Where to?

It is **unlikely that a systematic review would change the current recommendations** put forward in the Staying Healthy Guidelines.
A systematic review **would add value to the strength of the Guidelines**, as well as potentially expanding the Guidelines to additional topics outside the scope but relevant to the childcare setting (e.g., asthma, allergens)

It is unlikely that a systematic literature review will alter the current recommendations presented in the Staying Healthy Guidelines; however, it would provide evidence-based support and transparency of information.

01

Background

HEALTH
TECHNOLOGY
ANALYSTS

The aim of the scoping review is to gauge the volume of information on preventing infectious diseases in childhood education and care settings.

Population

Infants, children and adults

Notes
Specific population groups including pregnant women, Aboriginal and Torres Strait Islander and culturally and linguistically diverse communities to be identified and considered separately (where appropriate)

Setting

Early childcare and education services

Notes
includes day care, child care centres, family care, kindergarten, preschool and crèche

Will include studies in alternative settings involving children of the same age group (e.g., orphanage)

Intervention

Prevention and control of infectious diseases*

**Specific topics to include:*
hand hygiene, glove use, nappies and toileting, immunisation, food safety, bites and stings, exclusion, quarantine and physical distancing, general cleaning of play equipment, toys, sandpits

Various MESH terms to be applied in combination with specific topics including: infection control, bacteria, viruses, fungi

Comparator

Any*

(*any comparator considered relevant to the topic of interest)

Outcomes

Any*

(*any outcome considered to demonstrate whether the intervention achieves its intended purpose)

Example outcomes of interest include safety, adverse events, prevention, reduced spread, environmental sustainability etc.

Broad literature search terms were created to capture evidence related to the prevention, control & management of childhood infectious diseases.

#	Concept	Search string
1	Study limits	(editorial or letter or comment or historical article).pt.
2		(animals/ or nonhuman/) not humans/
3		1 or 2
4	Setting	exp *preschool child/
5		*kindergarten/
6		*child care/
7		(creche? or preschool$ or pre-school$ or pre?school$ or minischool$ or mini-school$ or mini?school$ or childcare$ or child-care$ or child?care$).ti,ab.
8		(child adj2 (daycare or day-care or day?care)).ti,ab.
9		(family adj (daycare or day-care or day?care)).ti,ab.
10		((daycare or day-care or day?care) adj2 (centre? or center? or setting or facilit$)).ti,ab.
11		((childcare or child-care or child?care) adj2 (centre? or center? or setting or facilit$)).ti,ab.
12		or/4-11
13	General infection control	exp communicable disease control/
14		infection prevention/
15		exp *isolation/
16		cross infection/dm, pc [Disease Management, Prevention]
17		((infection or bacteria or bacterial or viral or virus or fungal or fungus or fungi or protozoa or mite or parasite) adj (control or prevent*)).ti,ab.
18		exclusion.ti,ab.
19		or/13-18
20	Prevention and protection	exp hand washing/
21		*protective glove/
22		(face adj1 mask).ti,ab. or face?mask.ti,ab. or (hand adj1 (wash* or clean* or saniti* or care)).ti,ab. or handwashing.ti,ab. or hand-washing.ti,ab.
23		exp *coughing/
24		(((cough or coughing or sneeze or sneezing) adj2 (etiquette or behaviour or rules or protocol or practice or manners)) or (respiratory adj1 hygiene)).ti,ab.
25		or/20-24
26	Cleaning	(clean* or sterili$e or sterili$ation or disinfect* or antibacterial or bleach or saniti* or detergent or (spray adj2 wipe)).ti,ab.
27		exp disinfection/
28		*disinfectant agent/
29		or/26-28
30	Other concepts	(toys or bottles or dummies or sandpit or (play adj equipment)).ti,ab.
31		((cooking adj (class or demonstration)) or ((food or meal) and preparation) or breast?milk or breastmilk or formula).ti,ab.
32		pregnant woman/
33		(diaper or nappy or toileting or potty).ti,ab.
34		(scratch or cut or bite or animal or pet).ti,ab.
35		((soiled or dirty or contaminated) adj1 (linen or laundry or bedding or textile or material)).ti,ab.
36		or/30-35
37		(25 or 29) and 36
38		19 or 25 or 37
39		12 and 38
40		39 not 3

Inclusion and exclusion criteria were developed to guide screening of identified studies at title/abstract.

Studies of interest were those that evaluated any prevention, control or management interventions for infectious diseases in childhood education settings.

	Inclusion criteria	Exclusion criteria
Setting	• Any child/education based setting (i.e. childcare, family day care, early learning centres, kindergarten)	• Households • Hospitals and tertiary centres • Community and public health programs • Primary and high schools
Population	• Any person involved in the nominated setting (i.e. teacher, worker, parent, child, etc.)	• Staff or persons working in excluded settings

Intervention	• Any intervention or strategy to prevent, control or manage infectious diseases in the nominated setting. This may include:
	  • Education interventions
	  • Physical interventions
	  • Guidelines and protocols
		• Interventions that evaluate specific treatments to reduce or prevent infectious diseases
		• Interventions or strategies to prevent, control or manage non-communicable diseases in the nominated setting

Comparator	• None specified	• None specified

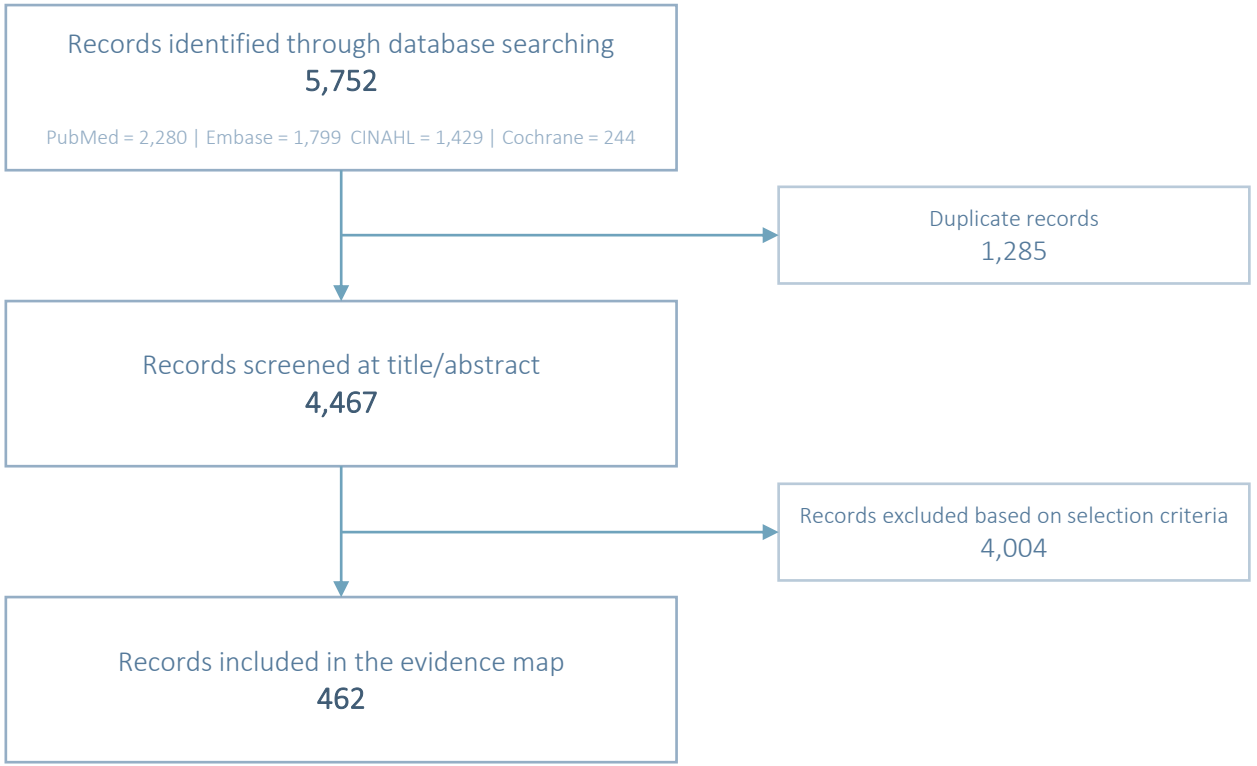
Outcome	• Any measures to evaluate the efficacy of nominated intervention to prevent, control or manage infectious diseases. This may include:
	  • Decreased transmission
	  • Improved behaviours
	  • Absenteeism
		• Measures that do not evaluate the efficacy of an intervention to prevent, control or manage infectious diseases. For example:
		  • Prevalence
		  • Vaccination uptake or coverage

02

Scoping the evidence

HEALTH TECHNOLOGY ANALYSTS

A total of 5,725 studies were identified; screening was performed by one reviewer at title and abstract only and based on inclusion and exclusion criteria



The most common reasons for exclusion were incorrect intervention, setting and population.

Many studies evaluated specific treatments

Numerous studies were in the correct setting and within the correct population, however, evaluated specific treatments for the prevention of infectious diseases (e.g., respiratory tract infections).

Many studies were in hospital and community settings

Various studies evaluated interventions of interest in the correction population, however, were in hospital, community and school settings.

Many studies reported on infection prevalence only

Several epidemiological studies were identified that reported on the prevalence of an infectious disease in the correct population group, however, did not report on measures for prevention, control or management.

Many studies reported on communicable diseases

A number of studies evaluated interventions for the prevention or management of communicable diseases or allergens (e.g., asthma, cystic fibrosis).

The most common reasons for exclusion were incorrect intervention, setting and population.

Many studies reported associated risks of childcare

Various studies identified investigated the associated risk factors between childcare attendance and either communicable or non-communicable diseases (i.e., childcare a.

Many studies were case studies on infection outbreaks

Several case studies were identified that retrospectively reported lessons of infection outbreaks within a childcare centre. Only a few of these included ways to incorporate these lessons into preventative measures.

Many studies evaluated the environmental risk factors

Some studies evaluated the air quality of childcare settings and the associated risk of developing disease.

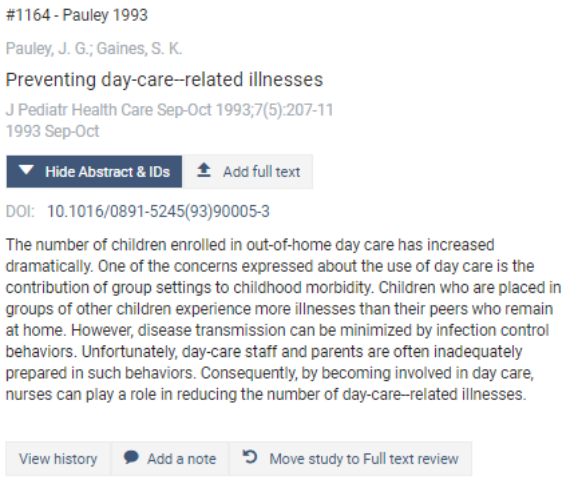
Many studies evaluated physical health in childcare

Some studies investigated interventions for the prevention of childhood obesity and other physical health attributes (i.e., diet, outdoor play).

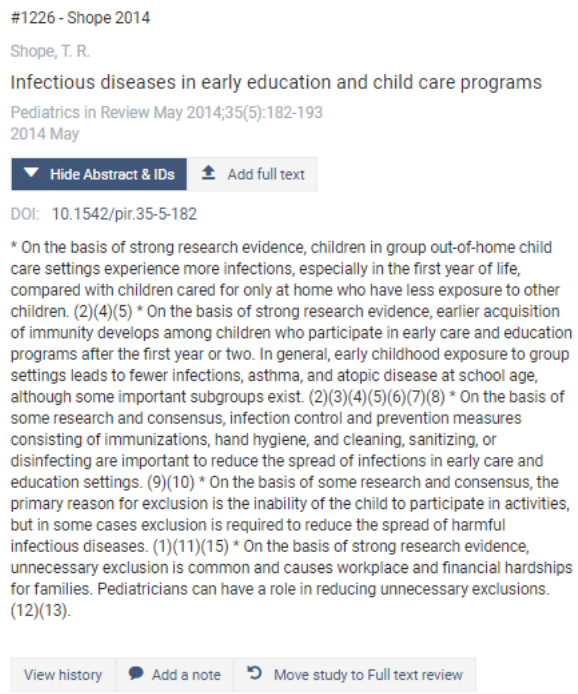
There are limitations to screening title and abstract only which can influence interpretation of the evidence map.

Not all studies provided an abstract, and while efforts were made to search for corresponding abstracts, some decisions to include or exclude were based solely on the title.

The study design of some citations were not able to be determined based on the abstract. In these situations, studies were mapped to "*Grey*" literature. Consequently, there may be an overrepresentation of "*Grey*" study designs in the evidence map.



Not all abstracts provide adequate information to determine the intervention and/or outcome. Some abstracts are vague, alluding only that a study reports on infection prevention and control measures.



03

Mapping the evidence

HEALTH TECHNOLOGY ANALYSTS

Based on the included studies, a range of appropriate intervention and outcome categories were determined.

Interventions

General prevention

- General management & control
- General surveillance & monitoring
- Exclusion & isolation
- Inclusion & management of ill children
- Medical clearance & return post infection
- Vaccination against common infections

Personal prevention

- Cough & sneeze etiquette
- Hand hygiene
- Personal protective equipment
- Nappy changing and toileting
- Education of staff, children & families

Environment

- Cleaning the childcare
- Fomites (e.g., toys, equipment, etc.)
- Textiles (e.g., towels, bedding, etc.)
- Cleaning product used (e.g., soap, sanitizer, spray & wipe, etc.)

Food

- General preparation, storage, handling of food
- General preparation, storage, handling of formula

Other

- Scratches & bites
- Animals
- Nurses & health professionals

Outcomes

Infection & transmission

- Safety and adverse events
- Rates, prevalence & spread
- Emerging pathogenic resistance
- General prevention measures

Actions

- Absenteeism
- Behaviour & practices
- Knowledge & understanding
- Policies

Environment

- Sustainability
- Pathogens
- Risk factors

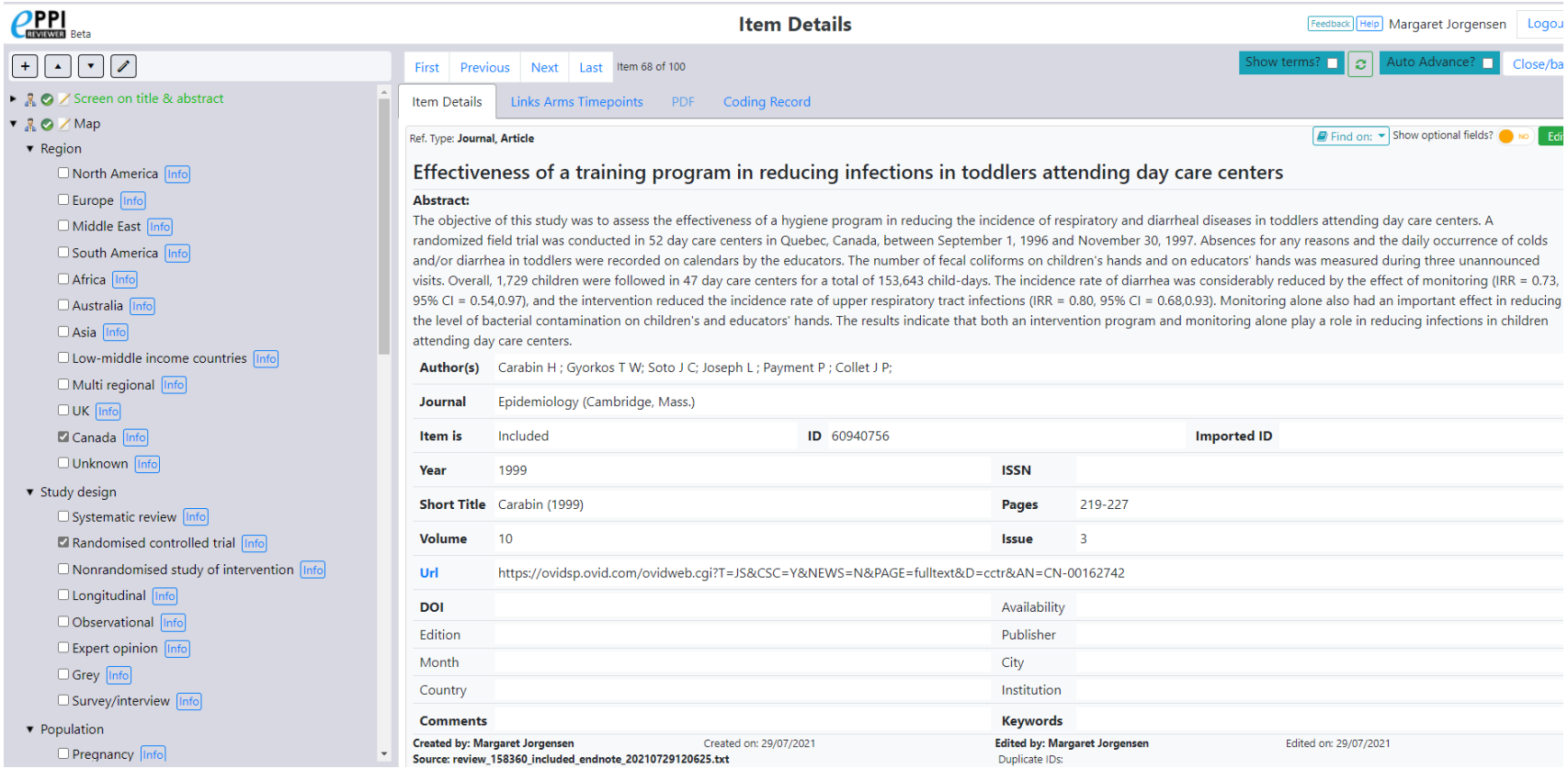
Other

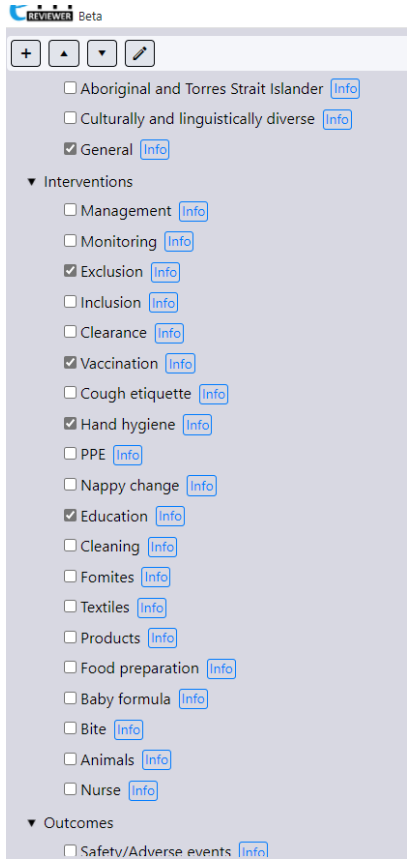
- Economic

Category topics were determined based on the information within the title and abstract.
In some instances, these topics are broad and encompass an array of studies, others are more specific.
Where possible, topics reflected those outlined in the current *Staying Healthy* Guidelines

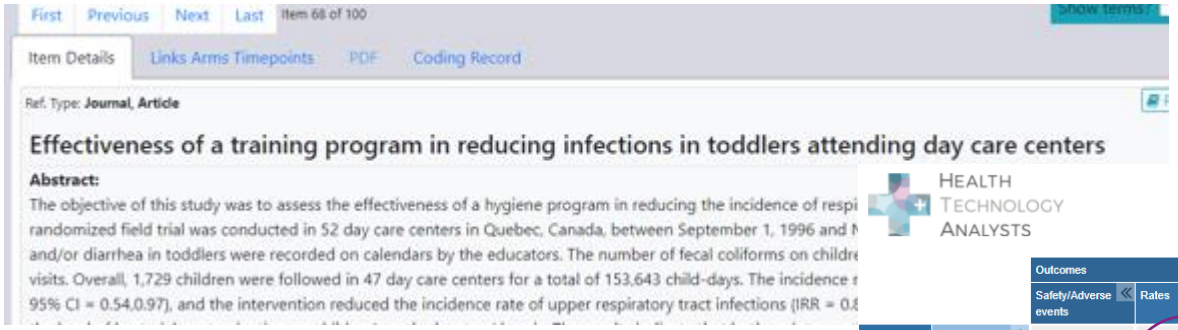
Studies were mapped using *EPPI Reviewer* according to the intervention/s and outcome/s reported in the title and abstract.

The example below illustrates a study that would be mapped to outcomes of "*Rate*" and "*Pathogen*" as well as the interventions of "*Hand hygiene*", "*Education*", "*Vaccination*" and "*Exclusion*".





Studies with various interventions and outcomes are represented multiple times in the evidence map.



The study above would be mapped to outcomes of "*Rate*" and "*Pathogen*" as well as the interventions of "*Hand hygiene*", "*Education*", "*Vaccination*" and "*Exclusion*".

In total, this study would appear eight times in the evidence map (circles show how this would occur).

Studies were also classified by study design and region; where possible particular study populations were also identified.

This allows the user to filter studies by a combination of study design, region and population.

As previously noted, the study design of some citations were not able to be clearly identified in the abstract. In these situations, the study was classified as "*Grey*". Therefore, there may be an over representation of "*Grey*" literature.

Study design

- SR
- RCT
- NRSI
- Longitudinal
- Case series
- Expert
- Grey

Region

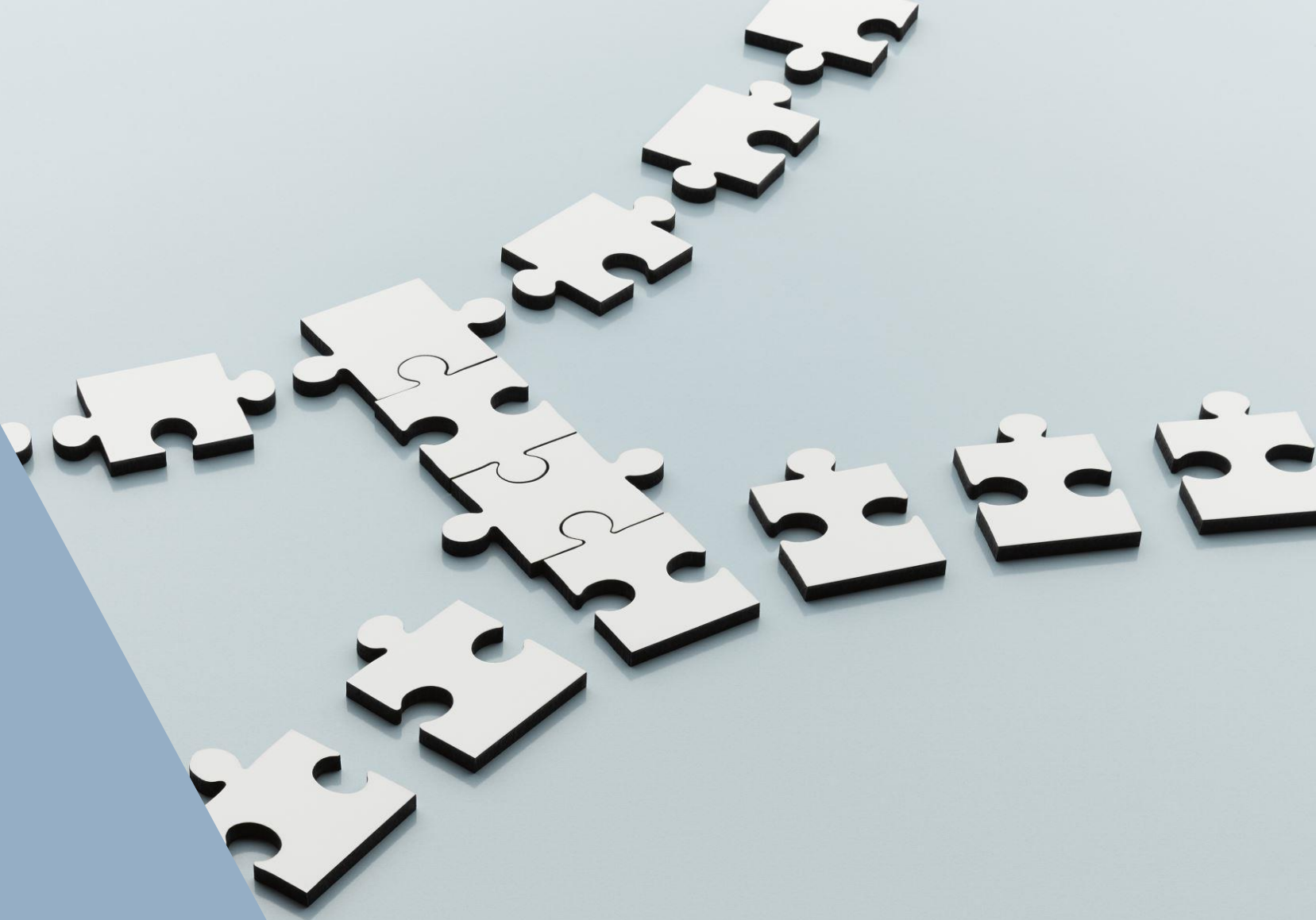
- Australia
- UK
- Europe
- Canada
- North America
- South America
- Africa
- Asia
- Middle East
- Low & middle income
- Multi-regional

Population

- Pregnancy
- Teachers
- Families
- General
- Aboriginal & Torres Strait Islander
- Culturally & linguistically diverse

04

Findings and gaps



HEALTH TECHNOLOGY ANALYSTS

Based on the scoping review, a large proportion of the evidence is on hand hygiene and education for the management and prevention of infectious diseases.

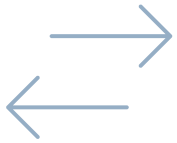
92 and 46

Studies addressed general management and monitoring for prevention, respectively.

Behaviour

Various studies sought to identify the behaviour of persons within the childcare setting in relation to preventing infectious diseases. This may provide managers **insight into supporting positive behavioural change** when implementing policies and strategies.

Hand hygiene



Education

A significant amount of evidence appears to be in hand hygiene and education for the management and prevention of infectious diseases.

There is evidence addressing the types of products used within the childcare setting for personal and environmental cleaning and the impact on preventing infectious diseases

Gaps

There appears to be gaps in evidence for various topics raised in the current *Staying Healthy Guidelines* including the **safety** of general preventative measures (e.g. cleaning), **food safety**, environmental **sustainability** (e.g., reusable or disposable), and **celebration and cooking** with children.

Pathogens in the childcare setting

Several studies investigated the **where pathogens reside throughout the childcare environment**. This awareness supports childcare settings to pay particular attention to those potentially high-risk areas when working towards preventing and controlling infectious diseases.

Part 1: Concepts in infection control

	Evidence	What's new?	Where are the gaps?
1.1 Causes	This section of the document outlines the main types of germs causing infection.	Risk factors for infection within the childcare setting	It is not clear if the evidence addresses the causes of infection.
1.2 Spread	There appears to be some evidence for the transmission and spread of pathogens within the childcare centre. In addition, elements of spread and transmission are likely touched on in studies.	High risk areas harbouring pathogens, increasing the risk of infection and transmission.	It is unclear if the evidence specifically addresses elements of transmission.
1.3 Prevention	There is a large amount of evidence on general prevention measures. In addition, there is evidence for specific measures: • There is a significant amount of evidence on hand hygiene, including use of products (e.g., soap, sanitizer). • There is some evidence for exclusion of children and educating families on policies and procedures. • There is some evidence on environmental cleaning and when cleaning should be carried out (e.g., following nappy changing). • There appears to be some evidence for the cleaning products used (e.g., spray and wipe, detergent). • There is some evidence on the knowledge and understanding of staff regarding immunisation, particularly in pregnant women.	The importance of actively involving families in a range of prevention strategies including hand hygiene.	There appears to be gaps in the evidence for hand care, hand drying and clearance following exclusion. There are gaps in the evidence for glove use and allergies in adults and children.

Part 2: Monitoring illness in children

	Evidence	What's new?	Where are the gaps?
2.1 Monitoring	There is evidence for monitoring strategies as part of infection control and prevention. It appears that this evidence is about the knowledge and understanding of staff and families around policies and procedures (e.g., recognising symptoms, when treatment is required, etc.) as well as the methods for communication. There also appears to be some evidence for the use of monitoring systems to improve identification of potential outbreaks.	**No new concepts** addressed based on the titles and abstracts of identified studies.	There appears to be gaps in evidence for management of symptoms following immunisation. Much of the evidence for immunisation appears to be specifically about the vaccine used rather than post management. In addition, this evidence may be within the hospital or community setting. There also appears to be gaps in the evidence for specific information on reducing fever. It is unclear if there is evidence for record keeping regarding ill children.

Part 3: Procedures

	Evidence	What's new?	Where are the gaps?
3.1: Personal hygiene	There appears to be a large amount of evidence on personal hygiene. This evidence largely includes hand hygiene education interventions for improving child and adult practices, the most effective products to use when washing hands and when hands should be washed. There is limited evidence on PPE, including when gloves should be used.	The importance of actively involving families to support children outside the childcare setting to continue personal hygiene behaviours.	There appears to be gaps in the evidence addressing hand care, hand drying and best practice for glove use and other PPE.
3.2: Nappies & toileting	There is some evidence addressing various elements of nappy changing. Much of this evidence appears to be related to hand hygiene, however, some evidence appears to be related to the nappy change station. There appears to be some evidence on cleaning nappy changing environments. There is limited evidence on caring for the skin when changing nappies (e.g., use of creams) and for cloth vs disposable nappy use.	**No new concepts** addressed based on the titles and abstracts of identified studies.	There appears to be gaps in the evidence for toilet training. It is unclear if the evidence provides best practice for nappy changing procedures (e.g., placing paper on change table).
3.3: Spills	There is limited evidence for bodily fluids. There was minimal evidence on procedures for dealing with faeces and nasal discharge (including cough etiquette) and less evidence on procedures for dealing with blood. At least one study appears to address aspects of first aid.	**No new concepts** addressed based on the titles and abstracts of identified studies.	There are gaps in the evidence for procedures to deal with vomit and urine. There appears to be gaps in the evidence for procedures to clean up blood or other bodily fluids. Much of this evidence may be within studies in the hospital setting.

Part 3: Procedures continued

	Evidence	What's new?	Where are the gaps?
3.4: Cleaning	There is evidence for cleaning procedures in the childcare environment. There appears to be evidence for most effective products to use when cleaning and what areas may require more attention. There is evidence addressing the pathogens residing on fomites and need for attention in preventing infection. This includes toys and equipment, basins, benchtops, nappy changing stations.	**No new concepts** addressed based on the titles and abstracts of identified studies.	There appears to be gaps in the evidence on cleaning cots, dummies, toothbrushes, carpets, curtains, etc. It is unclear if the evidence addresses cleaning processes such as when to clean (i.e., decision trees) or if PPE should be used when cleaning.
3.5: Food	There appears to be limited evidence on food safety. There is some evidence addressing food handling and hygiene practices around food handling. Much of this evidence appears to be around hand washing when staff work in multiple areas of the childcare environment (e.g., nappy changing and food preparation) and general cleaning of the environment. There is some evidence for processes prior to eating (e.g., hand hygiene). There is limited evidence for preparation of formula.	**No new concepts** addressed based on the titles and abstracts of identified studies.	There are notable gaps in the evidence on food safety: • Preparation of raw and cooked foods • Food sharing practices • Heating and cooling of food • Preparation of breast milk • Storage and heating of either formula or breast milk • Children's cooking classes
3.6: Other considerations	There is limited evidence for other considerations. Limited evidence addresses hygienic procedures related to animals within the childcare setting. There was very limited evidence for procedures following bites and scratches.	**No new concepts** addressed based on the titles and abstracts of identified studies.	There is a notable gap in the evidence for other considerations including sandpits, celebration cakes and blowing out candles, playing with play dough. There is a gap in the evidence for bat bites, fleas, fish and marine animals.

Part 4: Issues for employers, educators and other staff

	Evidence	What's new?	Where are the gaps?
4.1: Health & safety	There is evidence for general management and prevention strategies. Some of this evidence is related to policies and some appears to be related to the health and safety of staff. There is also evidence for the knowledge and understanding of staff regarding infection control measures and policies within the childcare setting.	**No new concepts** addressed based on the titles and abstracts of identified studies.	It is unclear how much evidence addresses workplace health and safety.
4.2: Immunisation	There is some evidence relating to the knowledge, understanding and behaviours of staff on immunisations. Some of the evidence may address the most relevant immunisations for staff within the childcare setting.	**No new concepts** addressed based on the titles and abstracts of identified studies.	There appears to be a gap in the evidence for specific policies on unvaccinated staff (e.g., exclusion, restrictions).
4.3: Pregnancy	There is some evidence on the risk factors of pregnancy women (or women of childbearing age) associated with working within the childcare setting. Cytomegalovirus appears to have the most evidence. There appears to be some evidence for the management of risk factors identified.	**No new concepts** addressed based on the titles and abstracts of identified studies.	There appears to be gaps in evidence for other infectious diseases during pregnancy including listeriosis and rubella.
4.:4 Public health units	There is some evidence on the importance and value of involving public health professionals in the childcare setting (e.g., nurses). There may be some cross over in evidence for monitoring of infectious diseases (e.g., studies monitoring child health and reporting to public health units).	**No new concepts** addressed based on the titles and abstracts of identified studies.	There appears to be a gap in the evidence regarding notifiable diseases.

Results from the scoping review suggest there are no new concepts that are not already addressed in the current *Staying Healthy* Guidelines.

The findings from the scoping review suggest that there is an **abundance of literature** relevant to the prevention and management of infectious diseases.

The **evidence** within the childcare setting is primarily **international based** and of a **lower quality** making it difficult to draw strong conclusions and generalise to the Australian setting.

Based on the titles and abstracts, there **does not appear to be any new concepts** to tackle the prevention and management of infections that have not already been addressed in the current *Staying Healthy* Guidelines.

Based on the results, it is unlikely that the evidence would change the recommendations outlined in the current Staying Healthy Guidelines.

Executing a systematic literature review would give an evidence base to the Staying Healthy Guidelines, setting a standard and adding value.

A systematic literature review would **align the document with other guidelines and evidence-based standards**.

Identifying the evidence and acknowledging the gaps would provide **transparency and strength to the current recommendations**.

Results of the scoping review suggest there may be **some studies** (excluded from evidence map) **addressing information outside the current scope** of the Guidelines but **with relevance to the childcare setting** (e.g., asthma, allergens).

Results of the scoping review suggest there may be **some studies in other settings such as hospitals and communities** (excluded from evidence map) that **could** be drawn on to **support and inform recommendations**

Results suggest an evidence review would add value to the strength of the Guidelines and could draw on evidence in other settings (e.g., hospitals) to inform recommendations, as well as potentially addressing additional topics currently outside the scope of the Guidelines.

Thank you

Margaret Jorgensen

Director

+61 2 9193 7777

margaret.jorgensen@htanalysts.com.au

Alison Miles

Senior Consultant

+61 2 9193 7777

alison.miles@htanalysts.com.au