Workbase
Leading health literacy

Health literacy and the prevention and management of skin infections

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Glossary

Abscesses	Skin abscesses are also called boils and are usually painful, pus-filled infections which have gone deep below the skin surface. Abscesses usually start around a break in the skin or a hair follicle and can spread to the surrounding skin
Absolute risk	The probability of something occurring
Action-focused language	Language that mainly describes actions and which uses the active voice, such as “you will” instead of the passive voice, such as “a person might”
Ask-me-3	A communication strategy designed to improve communication between patients and health care providers, encourage patients to become active members of their health care team, and promote improved health outcomes. The strategy encourages patients to ask their health care providers three questions: **What is my main problem?** **What do I need to do?** **Why is it important for me to do this?**
Boils	Painful, pus-filled infections below the skin surface which usually start around a hair follicle and can spread to the surrounding skin
Carbuncles	Painful bacterial infections of the skin that usually have several openings containing pus
Cellulitis	A common infection where bacteria gets into broken skin or under the skin. The skin becomes swollen and red and broken skin produces pus
Chicken pox	A contagious disease, usually in children, that is caused by a virus and leads to small, itchy lumps on the skin, a slight fever, and feeling unwell. The lumps on the skin can become infected with bacteria
Cognitive load	The amount of information that must be processed by the brain’s working memory
Eczema	Eczema or Atopic dermatitis is a long-term skin disorder that creates dry, scaly and itchy patches on the skin
Face validity	How relevant or logical a test appears to the test participants
Germ theory	The theory about how germs cause infections
Health literacy	The degree to which individuals have the capacity to get, process, and understand basic health information and services needed to make good health decisions which is influenced by health professionals, healthcare organisations and the health system.

Homeopathy	Alternative medicine treatment where a patient is given natural substances to treat diseases or health problems
Impetigo	Impetigo, also known as ‘school sores’, is a highly contagious skin infection that is most common in infants and school children
Infographics	Pictures which explain concepts
Intravenous antibiotics	Antibacterial medication delivered straight into the bloodstream through a needle into a vein
Measles	A contagious viral disease, usually occurring in childhood, causing red spots on the skin and fever
Medication reconciliation	Transfer of information about medication from one record to another
Mumps	A contagious disease causing swelling of the salivary glands and sometimes of the pancreas, ovaries, or testes. Mainly affects children
National clinical guidelines	Recommendations about how best to treat and care for people with specific illnesses and conditions within the New Zealand health system
Navigating the health system	Understanding and using the health care system
Primary Health Organisation (PHOs)	Organisations funded by the government via District Health Boards to organise and fund primary health care (such as general practitioners) for the people they enrol in a region
Plain language	Language that is simple and free of jargon and technical terms
Primary healthcare	First level of contact that people have with the healthcare system e.g. general practice medicine
Relative risk	A comparison between different risk levels e.g. you are 10 times more likely to get lung cancer if you are a smoker
Ringworm	A contagious skin diseases caused by several fungi, characterized by ring-shaped, scaly, itching patches on the skin
Rongoā	Traditional Māori medicine
Scabies	Scabies is an itchy rash caused by a small mite that burrows in the skin surface
Schema theory	A theory about how people represent and organise knowledge in their long-term memory. Schema theory says that people relate new information to what they already know or have experienced
Septicaemia	Infection of the bloodstream

Subcutaneous tissue	Flesh that is just under the surface of the skin
Talking Points	Scripts to help health professionals talk with their patients
Universal precautions approach	Where health professionals use every interaction with health consumers to check whether consumers have health literacy needs. It also means providing clear communication (both written and spoken) to all consumers and actively building their health literacy knowledge and skills

Executive summary

New Zealand has one of the highest rates for childhood skin infections in the western world, with Māori children more than one-and-a-half times more likely than non-Māori to be hospitalised due to skin infections (Craig et al 2007). In many cases hospitalisation means intravenous antibiotics and even surgery.

Health literacy involves health organisations, health practitioners, and patients and their families. It is described as 'the degree to which individuals have the capacity to obtain, process, and understand basic health information and services needed to make appropriate health decisions' (Institute of Medicine 2004, p 2; Ministry of Health 2010). For health practitioners, health literacy is about their ability to communicate health information, and for health organisations it is about the appropriateness of the health information and services they provide for patients and their families. There is a strong relationship between a person's health literacy and their health status (Ministry of Health 2012).

Workbase was contracted by the Ministry of Health to undertake research in health literacy, with a focus on the prevention and management of skin infections for Māori. A clinical Reference Group comprised of three senior child and Māori health experts supported the project team. The aim of the project was to identify and assess the effectiveness of health literacy interventions for strengthening the prevention and management of skin infections in Māori children less than 15 years of age. The objectives of the research were to:

1. identify health literacy barriers and facilitators in the prevention and management of skin infections
2. highlight interventions that may be effective in strengthening health literacy to allow the better prevention and management of skin infections
3. demonstrate ways to increase health literacy in order to improve outcomes associated with skin infections.

Method

The research was undertaken in four phases.

1. Literature reviews for skin infections and health literacy were completed. A resource stocktake of skin health resources available in New Zealand was undertaken through an online search and the gathering of hard copy resources the health practitioners and providers interviewed in the project identified as most commonly used.
2. Consultation was undertaken with parents, caregivers and health practitioners. Focus groups were held with 23 parents and caregivers from two school communities. Face-to-face interviews were carried out with 22 health practitioners, and an online survey of health practitioners and providers returned 87 responses. Four teachers were also interviewed.

3. Resources were developed. A booklet and poster about skin infections was developed for parents and caregivers. Teachers, public health nurses (PHNs), or other health practitioners can use these resources in their discussions with parents and caregivers about skin infections, and possible scripts for health professionals, called Talking Points, were developed as guides for these discussions. Teaching materials were also produced for health practitioners working in schools as well as for teachers to use with children as part of the school curriculum.

4. Resources were trialled. The resources were trialled by health practitioners, health educators, teachers, parents, caregivers and children. Feedback was sought through a series of questions related to whether the resources had been used and the usefulness of the resources, including what parents and caregivers liked and the questions the resources provoked.

Findings

a) Health literacy barriers and facilitators

Barriers to health literacy for parents and caregivers include: difficulty in reading health materials, difficulty in communicating with health care providers, information overload, and information inconsistency. Parents and caregivers reported problems with receiving both minimal and contradictory advice and treatment from GPs, particularly for ongoing skin conditions. Apart from personal contacts, parents and caregivers were unsure about where to seek effective, affordable and practical advice about skin infections other than from a GP. Once people have information they can understand they also need to be empowered to act upon it. Action about skin infections requires parents and caregivers to see infections as serious, make decisions to seek health care, and to also have the financial ability to access health care.

Health practitioners acknowledged that an inability to afford health care and other conditions linked with poverty (e.g. overcrowding) challenge the prevention and management of skin infections.

Parents and caregivers whose children have frequently occurring skin problems (e.g. eczema) reported they were vigilant around prevention and management. Parents and caregivers whose children had less regularly occurring skin infections relied on their children reporting conditions, or the infections being noticed during routine activities. When parents and caregivers sought health care they reported difficulties with seeing different doctors each visit, and receiving contradictory advice.

b) Communication that strengthens health literacy

Communications between health practitioners and patients can be improved when one form of information supports another (such as visual information supporting verbal information), a brief narrative structure and repetition are employed, and messages are culturally relevant. Health literacy education for clinicians is also

recommended, along with approaching every patient interaction by checking the health literacy needs of the patient and their support group.

Parents and caregivers interviewed wanted timely and consistent information and advice that would explain and show them how to prevent, identify and manage skin infections, including when to seek medical assistance. Parents and caregivers were particularly interested in understanding how to overcome recurring infections, such as impetigo, and reduce the risk of ongoing skin conditions, such as eczema and insect bites, becoming infected. Many of the health practitioners surveyed provided advice to parents and caregivers about the prevention and management of skin infections, and supported this advice with written material. PHNs described parents and caregivers as preferring resources with practical information and pictures. Both teachers and PHNs saw value in teaching materials for the classroom about skin health.

c) Increasing health literacy

The skin infection resources developed for parents and caregivers (a booklet and poster) are action oriented and focus on what parents and caregivers are likely to see at home, can do at home, and need to monitor when deciding if a child needs to see a general practitioner (GP). The resources developed for health professionals (scripts called Talking Points) are designed to help them work through the booklet or poster with parents and caregivers to check what people already understand, reinforce good practice, and build new knowledge and skills where needed.

PHNs were identified as well positioned to work with parents and caregivers to build health literacy about skin infection prevention and management. Feedback on the booklet and poster from health practitioners, parents and caregivers was very positive. Eight lesson plans for use by PHNs and school teachers were also developed. Feedback from teachers about the lesson plans was positive.

Conclusion

Improving the health literacy of parents and caregivers will contribute to improved prevention and treatment of skin infections in children. The present research identified the barriers to and facilitators of this health literacy and interventions to improve health literacy. This led to the development and trialling of resources for parents and caregivers that health practitioners and teachers can use to discuss the prevention and management of skin infections. The booklet and poster were well received by health practitioners and by parents and caregivers, who requested copies to take away and distribute. The lesson plans developed for schools also received positive feedback from teachers. The acceptability of the resources developed is a first test of their potential effectiveness in building health literacy and supporting a reduction in the incidence of serious skin infections and resulting hospitalisations for children.

Recommendations

During the course of this project opportunities have been identified for increasing health literacy in relation to the prevention and management of skin conditions and infections through improving existing skin health resources and using the new resources developed during the project.

Existing resources regarding skin conditions could be improved by ensuring messages reflect the clinical guidelines or evidence-base available, adding photographs of skin infections, and further explanation of the complex and difficult concepts in the resources. Guidance about how a health practitioner can work through a resource with parents and caregivers would also be beneficial.

With regard to the resources developed and trialled during the project, the following recommendations are made:

1. Publishing the skin infections booklet and poster using photography that depicts Māori children and parents and caregivers (noting that parents and caregivers interviewed during the project wanted hard copy resources rather than online material).
2. Publishing the Talking Points (scripts) as a model of good practice in using a resource to build health literacy and seeking further feedback on the Talking Points from health practitioners to determine how they are being used and could be improved.
3. Encouraging the use of the Talking Points through professional development for health practitioners, focusing on how to use the resources to engage and empower parents and caregivers to build health literacy and improve the prevention and management of skin infections.
4. Distributing hard copies of the booklet, poster and Talking Points to primary healthcare providers.
5. Making the lesson plans available online for health practitioners and teachers to use in schools.
6. Publishing the lesson plans about germ theory and how the body fights infection as these provide relevant background knowledge for many health conditions, and hard copy resources will encourage uptake by schools.
7. Producing the lesson plans and poster in the Māori language so that they may be used in Kura Kaupapa Māori and wharekura.
8. Consider developing and publishing resources that were requested by participants:
    - an extended version of the booklet and poster, including other skin conditions or childhood illnesses, and/or a section describing what healing looks like
    - guidance about home or alternative remedies.

Part 1. Introduction

Skin infections are bacterial infections of the skin or subcutaneous tissue, such as cellulitis, impetigo, abscesses, and boils. Broken skin caused by cuts, grazes, insect bites, eczema, scabies, and chicken pox can also lead to skin infections. Skin infections can become serious very quickly as bacteria spread to the surrounding tissue and lead to conditions such as septicaemia and kidney failure. Serious skin infections are distressing for those affected, especially children, and are highly preventable (Baker et al 2012). This section provides a brief introduction to health literacy as well as skin infections (see Appendix 1. and Appendix 2. for expanded literature reviews on health literacy and skin infections respectively).

1.1 Health literacy

Health literacy is described as 'the degree to which individuals have the capacity to obtain, process, and understand basic health information and services needed to make appropriate health decisions' (Institute of Medicine 2004, p 2; Ministry of Health 2010). Health literacy is more than improving the quality of information and information flow between individuals, communities, health practitioners and the health system. Health literacy also requires individuals to be able to synthesise the information they receive from the health system and other sources, decide whether they have enough information and if not gather more, and then act on the information. This concept of empowered self-care runs alongside the process and outcome of becoming more health literate.

There are a number of behaviours that may indicate a person has low health literacy, although these alone do not constitute evidence of low health literacy. These indicators include: regularly missing medical appointments, ignoring or misunderstanding health instructions or advice, asking a number of questions or asking no questions, arriving with incomplete forms, avoiding filling in forms or taking additional spare copies, and making excuses about forgetting their glasses and needing to read the information at home (Weiss 2007). In addition 'patients rarely identify themselves as struggling with literacy issues' (Rudd et al 1999, p 183), and seldom ask for assistance in reading health related materials.

More than half (56.2 percent) of adult New Zealanders have low health literacy skills (Ministry of Health 2010). Groups with poor health literacy include older people, Māori, people in Pacific and other ethnic minority groups, and people on low incomes. Māori have poorer health literacy than non-Māori regardless of age, gender, income, employment status, education level or location. There is a strong relationship between a person's health literacy and their health status (Ministry of Health 2012). Although there is little research that specifically investigates the health literacy of children, there is evidence that low literacy amongst parents or caregivers is related to worse health outcomes for children (DeWalt and Hink 2009). One longitudinal study about literacy and asthma self-management skills showed that

improvements in the reading abilities of minority children reduced repeat emergency department visits and hospitalisations (Robinson 2008).

Health literacy is also influenced and defined by culture. Zarcadoolas et al (2006) state that as a component of health literacy, cultural literacy (i.e. the ability to understand and use culture and social identity to interpret and act on information) is clearly needed by all stakeholders in order to improve health care and health outcomes. As the Institute of Medicine (2004, p 9) states, 'culturally influenced perceptions, definitions and barriers can affect how people interact with the health care system and help determine the adequacy of health literacy skills in different settings'. Furthermore, the Institute claims that health literacy is not just shaped by cultural differences between patients and providers but also between those who create the health messages and those who use them. Socio-cultural factors are therefore important for public health campaigns, especially when vulnerable groups are being targeted.

1.2 Skin infections

Infections of the skin and soft tissue are a high priority global issue with developed countries seeing rapidly rising rates of incidence (Regional Public Health 2012). O'Sullivan and Baker (2012) found that over 10 percent of children in the Tairawhiti District Health Board region had consulted their general practitioner (GP) over a skin related issue, with the majority receiving adequate treatment in the primary setting and avoiding hospitalisation.

New Zealand has one of the highest hospitalisation rates for childhood skin infections in the Western world (Craig et al 2007). Between 2005 and 2009 skin infections were the third most common cause of hospitalisations among Māori children, accounting for 10 percent of hospital admissions (New Zealand Child and Youth Epidemiology Service 2012). O'Sullivan et al (2011) found that between 1990 and 2007 serious skin infection rates in New Zealand effectively doubled, with over 100 children per week being admitted to hospitals for the treatment of skin infections, many of which needed intravenous antibiotics, and one-third of which required surgery. Hospital admission rates are highest among preschool-aged children, Māori and Pacific children, boys, and children living in low socio-economic areas (O'Sullivan et al 2011). Māori and Pacific children are at greater risk of skin infections and of suffering complications from skin infections than European children (Fawthorpe 2007; Ete-Rasch 2009; O'Sullivan and Baker 2012).

Socio-economic deprivation is the most common cause of a higher risk of skin infections (Baker et al 2012; Turner et al 2011). Children living in socio-economically deprived areas are 4.3 times more likely to have a skin infection than those from the least deprived areas (University of Otago 2011). Hunt (2004, p 32) notes that Māori and Pacific populations are generally found in more deprived areas and with 'increasing deprivation there are increasing numbers and rates of hospital admissions for skin infections'. Other explanations for a higher risk of skin infection

include a lack of awareness, knowledge and education about skin infections (Morgan, Selak and Bullen 2004), and barriers to accessing health care.

Health literacy knowledge and skills can assist parents and caregivers with the prevention, identification and treatment of children's skin infections at home, as well as understanding when to seek primary health care in order to prevent more serious infection and hospitalisation. The communication skills and cultural responsiveness health practitioners and health educators can use play a critical role in engaging parents, caregivers and children and facilitating their knowledge about skin infections (Edwards et al 2012).

1.3 The project

In New Zealand, Kōrero Mārama identified that instead of viewing health literacy as an issue for the individual patient, where the onus is on the individual to lift their skills, the solution lies in a concerted effort from all sectors including schools, government agencies and the health care system (Ministry of Health 2010). This report describes the findings of a research project (the project) focused on health literacy and the prevention and management of skin infections for Māori children. The project was commissioned by the Ministry of Health and carried out in 2012 by Workbase Education Trust.

The aim of the project was to identify and assess the effectiveness of health literacy interventions for strengthening the prevention and management of skin infections in Māori children less than 15 years of age. The objectives of the research were to:

1. identify health literacy barriers and facilitators in the prevention and management of skin infections
2. highlight interventions that may be effective in strengthening health literacy to allow the better prevention and management of skin infections
3. demonstrate ways to increase health literacy in order to improve outcomes associated with skin infections.

1.3.1 Project team

A project team of health literacy researchers and resource developers from Workbase was established. A primary health care nurse specialist was recruited to assist the project team by providing clinical expertise during interviews with parents and caregivers and the review of clinical literature, and to facilitate contact with health practitioners.

1.3.2 Reference group

A Reference Group was established to provide clinical guidance to the project team. The Reference Group included Professor Innes Asher, Head of Paediatrics, University of Auckland; Lorraine Hetaraka-Stevens, Associate Director of Nursing –

Māori Health, Auckland District Health Board; and Dr Alison Leversha, Community Paediatrician, Starship Children's Hospital.

Leonie Matoe, Nutrition and Physical Activity Manager, Te Hotu Manawa Māori, supported the Reference Group and project team by providing links to Māori communities and health research. The Reference Group had five meetings and contributed to the development of the project plan, identified existing data and research to review, provided feedback on the literature review, resource ideas and content, and reviewed project findings.

1.3.3 Other skin infection projects

In New Zealand work is under way to improve the prevention and management of skin infections in Wellington with the Keeping Well, Healthy Skin Greater Wellington project (Regional Public Health 2012), and in Auckland with the Greater Auckland Integrated Health Network (GAIHN) project. Both regions are providing information resources to guide health practitioners and allied health workers in the prevention, assessment, management and treatment of common skin conditions. Meetings were held with representatives of GAIHN and Healthy Skin Greater Wellington projects to identify the activities they have under way. GAIHN and Healthy Skin Greater Wellington have both indicated they would like to use and distribute the resources created from this project as examples of how health practitioners can work with parents and caregivers to build health literacy.

1.4 Report structure

Part 2 of this report follows this Introduction and describes the research method used in the project.

Part 3 describes the findings related to Objective 1; that is, the barriers to and facilitators of health literacy in the prevention and management of skin infections.

Part 4 describes the findings related to Objective 2; that is, interventions that may be effective in strengthening health literacy to allow the better prevention and management of skin infections.

Part 5 describes the development and assessment of health literacy resources in fulfilment of Objective 3; that is, demonstrating ways to increase health literacy in order to improve outcomes associated with skin infections.

Part 6 provides an overall discussion of the research.

Part 2. Method

The research was conducted in four phases. Phase 1 involved the search of relevant literature and health literacy resources. In Phase 2 parents, caregivers and health practitioners were interviewed, and health practitioners also surveyed. In Phase 3 health literacy resources were developed based on the findings from Phases 1 and 2. In Phase 4 the resources were distributed to PHNs and teachers who then provided feedback on their use of the resources with children, parents and caregivers. The alignment of each phase with the three research objectives is outlined in Table 1 below.

Table 1. Alignment of research objectives with research phases

Research Objectives	Phase **1**	Phase **2**	Phase **3**	Phase **4**
1 Identify health literacy barriers and facilitators in the prevention and management of skin infections	✓	✓		
2 Highlight interventions that may be effective in strengthening health literacy to allow the better prevention and management of skin infections	✓	✓	✓	
3 Demonstrate ways to increase health literacy in order to improve outcomes associated with skin infections				✓

2.1 Phase 1. Literature and Resources

The project began with sourcing and analysing existing information on skin infections and health literacy:

- **Literature reviews** National and international research was reviewed to produce a literature review about health literacy and a separate literature review on skin infections (Appendix 1. and Appendix 2.). Primary searches were done using Google Scholar, with secondary searches done on PubMed. Search terms for health literacy included ‘health literacy’, ‘patient communication’ and a range of qualifiers (e.g. assessment, education, tools, culture). Search terms for the skin infections included ‘skin infections’ and the named conditions, as well as qualifiers related to skin infections in children, and the prevention and management of skin infections.
- **Stocktake of resources** Hard copy and online resources about skin infections for parents, caregivers and children were collected. The health practitioners interviewed (Phase 2) identified further resources to be added to this stocktake (Appendix 3.).
- **Health Literacy Demands** were prepared, describing the health literacy knowledge and skills required (by parents and caregivers) to manage skin infections as they progress from an initial break in the skin or minor infection to a serious skin infection (Appendix 4.).

2.2 Phase 2. Consultation

2.2.1 Focus groups with parents and caregivers

Focus group discussions were carried out with 23 parents and caregivers from two low decile school communities. Parents and caregivers were invited to interviews via their school or Kura Kaupapa Māori. The terms parent and caregiver were not defined by the researchers. One school sent a note home with children inviting parents and caregivers to participate in focus groups and the other invited parents and caregivers to focus groups following parent-teacher interviews at the school. Approximately 90 percent of the focus group participants were Māori with the remainder being Pacific people. Parents and caregivers whose children experience frequent skin infections (such as impetigo) or have ongoing skin problems which can lead to infection (such as eczema) were the largest groups to participate in the focus groups.

Focus group participants identified that their main reason for participating in the interviews was a strong desire to know more about skin infections. Participants discussed their experiences, skills and knowledge in preventing skin infections, identifying and managing skin infections, navigating the health system, and accessing health information and supplies. Participants also identified the questions they had about skin infections and what else they wanted to know about preventing and managing skin infections.

2.2.2 Health practitioner interviews

PHNs were identified as a group of health practitioners particularly well placed to provide health literacy support as they work with parents and caregivers, schools and children to help treat acute and ongoing skin infections, as well as helping schools, communities, and parents and caregivers with longer term prevention. Face-to-face interviews were conducted with 18 PHNs, a community health worker, and three clinical nurse managers, all working in locations with high rates of skin infections.

The information sought from the health practitioners related to:

- their work with parents, caregivers and Māori communities
- the information, advice and help they provide about skin infections in children
- checks (if any) they made about the health literacy of patients
- explanations for increasing rates of skin infection among children
- health conditions that were being managed effectively by parents and caregivers.

Four teachers also participated in face-to-face interviews. They were also asked how skin infections are managed by schools, and to identify opportunities to develop health literacy amongst children via the school curriculum.

2.2.3 Health practitioner surveys

Eighty-seven health practitioners responded to a survey, including 42 PHNs, 28 school nurses, and a small number of practice nurses, GPs, nurse practitioners, community health workers, and primary health care workers from 13 district health board (DHB) regions. The survey was carried out before and during the interview phase of the project to gain a broad understanding of the services and experiences of health practitioners in working with children, parents and caregivers with skin infections. Survey questions covered service and information provision, explanations for increasing rates of skin infection, and the management of skin infections and other health conditions by parents and caregivers.

A shorter online survey about the expectations of organisations providing primary health care leadership received seven responses from six primary health organisations (PHOs). Three of the PHOs are based in large urban centres with high proportions of Māori and Pacific people in their populations. The three other PHOs were from regions with high proportions of Māori in their populations living in both urban and rural settings.

2.3 Phase 3. Resource Development

Using information gathered during consultation, several resources were generated to guide health practitioners' practice in relation to building the health literacy of parents, caregivers and children:

- A booklet and poster for parents, caregivers and children focusing on understanding the general principles of skin health and maintaining healthy skin, preventing and identifying skin infections, treating skin infections, and when to seek advice from a health practitioner. Teachers, PHNs, or other health practitioners are also able to use these resources when they are discussing skin infections (Appendix 5. and Appendix 6.).
- Talking Points (scripts) for health practitioners to use when working through the booklet or poster with parents, caregivers or children (Appendix 7.).
- Lesson plans for primary school settings focusing on understanding skin as an organ, germs and keeping skin healthy (Appendix 8.).

The Reference Group provided initial feedback on the resources.

2.4 Phase 4. Resource trialling

The booklet, scripts and poster were distributed to approximately 50 PHNs, some of whom had been surveyed or interviewed earlier in the project, along with a community health worker who had facilitated access to parents and caregivers. Twenty-nine PHNs and the community health worker used the booklets and poster with children, parents and caregivers and provided feedback to the researcher.

Feedback was sought through a series of questions related to whether the resources had been used, the usefulness of the resources including what parents or caregivers

liked and the questions the resources provoked, and anything that might be added to or changed in the resources.

Seven teachers trialled the lessons with 181 children. Two of the lesson plans were translated into the Māori language for use by staff at a Kura Kaupapa Māori. Teachers' feedback on the usefulness of the resource was sought through questions about its use, including what the students liked and did not like, and anything that might be added to or changed in the resource.

Part 3. Health literacy barriers and facilitators

The barriers to and facilitators of health literacy related to the prevention and management of skin infections were elicited through the literature reviews (Phase 1) and the stakeholder consultation (Phase 2).

3.1 Phase 1. Literature review

The literature reviews identified barriers to, and facilitators of both health literacy and the prevention and management of skin infections.

3.1.1 Health literacy

Barriers to health literacy

Difficulty in reading materials and difficulty in communicating with health care providers are two major health literacy barriers that individuals face when they access and use the health care system (Rudd et al 1999). Kickbusch et al (2005, p 9) assert that ‘access to good reliable information is the cornerstone of health literacy’ yet most health related material is written at a level beyond what most patients can understand (Kickbusch et al 2005; Levandowski et al 2006; Zarcadoolas et al 2006, Rudd et al 1999; Rudd et al 2007).

Patients who have trouble reading may better understand a spoken message. Spoken interactions are also context-rich and rely on more than words to communicate information and meaning, with tone, body language and gestures all playing an important part (Zarcadoolas et al 2006). On the other hand, speech is ephemeral and once the interaction is over there is nothing left except the memory (which may be incomplete) of what was said (Vandergrift 2006).

Kelly and Haidet (2007) also claim that many health care providers overestimate the health literacy levels of their patients. This leads to a lack of tailored communication that in turn leads to information that is beyond the understanding of the patient, with the potential outcome of non-adherence to a treatment plan. Koh et al (2012, p 435) also write that, ‘a wide chasm often separates what providers intend to convey in written and oral communication and what patients understand’.

Another major barrier to health literacy is an overload of information. There is a vast amount of health information available to patients, from an equally vast number of information sources, which can make finding and understanding the right information difficult (Kickbusch et al 2005; Zarcadoolas et al 2006; Institute of Medicine 2004). An additional outcome of an increase in information is a decrease in the consistency of the information. It is not uncommon for patients to get conflicting information from their information sources including their health care practitioners, the health system, the media, and their family and friends. This barrier to health literacy is underscored by Eagle et al (2006) who found that a sample of patients rated consistency of advice between doctors and pharmacists as very important.

Facilitators of health literacy

Facilitators of health literacy that health practitioners can use include:

- using face-to-face opportunities as much as possible to give medical advice
- using the teach-back method to check patient understanding. This involves the health practitioner checking on the quality of the communication by asking the patient to explain or demonstrate what they have been told
- reading written materials with patients or supporting the materials with verbal explanations
- supporting oral explanations with pictorial material or visual aids
- using plain language in spoken and written texts and making materials easier to use through a greater consideration of design, font, layout and pictures (Rudd et al 2007; Weiss 2007).

Although good knowledge of a health condition is essential for good health literacy, improved patient knowledge will not always lead to the desired change in behaviour. Kickbusch et al (2005, p 9) state that 'health information alone will not be useful to people who do not feel they have the power to act'. Confidence and self-efficacy to act on the information and to help others is what counts, and this requires additional inputs such as community development and education (Nutbeam 2008; Kickbusch et al 2005; Zarcadoolas et al 2006). The ultimate goal is greater independence and empowerment in individuals and communities to effectively manage their health. For this to happen a greater understanding is needed around the potential of health education to help focus health dialogue on the social determinants of health (Nutbeam 2008).

Rudd et al cite recent medical and public health reports that recommend that future studies in the area of health literacy 'continue to include – but move beyond the doctor-patient encounter ... and include investigations into health-related activities at home, in the workplace, in the community, and in a range of health systems and care settings' (2007, p 183). In addition Rudd et al highlight the importance of attention to the broad range of skills involved in health literacy, including a closer examination of patient information-seeking skills. Other areas that Rudd et al consider could facilitate better health literacy, and which require closer attention, include:

- considering the importance of patient background, knowledge and experience in health related activities and paying attention to assumptions that information-givers have about these
- considering the value that new technologies can add to the field of health literacy.

3.1.2 Skin infections

Skin infections are not always perceived as a serious health issue. As noted by Morgan et al (2004), skin infections have become commonplace and normalised by populations who experience them regularly. This is possibly because low socio-economic communities often experience competing health issues. Another barrier to seeking treatment is that people sometimes want to keep skin infections private

(Morgan et al 2004). A study with Pacific families identified that skin infections were perceived to be minor and likely to clear up of their own accord. This approach has been noted in a number of studies that find that skin infections are often subject to 'wait and see' treatment (Ete-Rasch 2009). The main trigger for Pacific parents to seek medical advice is if their child has a fever. However by the time a skin infection is advanced to the point of causing a fever, hospitalisation is often necessary (Leversha, personal communication, September 2012). As noted by Ete-Rasch (2009), hospitalisation for serious skin infections can be prevented with better home and primary care of minor cuts, grazes and insect bites. This requires people to know why and how to prevent and treat infections.

The skin infections literature review confirmed that socio-economic factors and poor health literacy, including inaccurate and insufficient knowledge about skin infections, contribute to the high rates of serious skin infections in New Zealand. (The complete skin infections literature review is provided in Appendix 2.)

3.2 Phase 2. Stakeholder consultation

3.2.1 Focus groups with parents and caregivers

During focus groups with parents and caregivers most participants reported eczema and associated skin infections to be the main skin problems experienced by their children. Participants asked many questions about eczema and the advice they had received from health practitioners. Participants wanted to understand more about how to prevent and manage eczema and associated skin infections in order to lessen the pain, discomfort and embarrassment their children experience. Participants described regularly monitoring their children's eczema, as well as good practice regarding washing and moisturising. Regular monitoring of skin health was less common in parents and caregivers with children who did not have eczema, where more reliance was placed on a child telling an adult about an injury or infection, or observing an injury or infection when a child was dressing or having a bath or shower.

Participants reported feeling rushed when seeing a GP and often thought of questions to ask following a consultation. Some GPs were described as treating recurrent skin infections, like boils or scabies, as acute individual illnesses rather than long-term or family health issues. Participants also reported problems with the continuity of care they received, such as:

- seeing a different GP each time they went to their medical centre
- GPs seldom referring to children's medical records prior to or during consultations
- GPs providing advice that contradicted that given by other GPs during prior consultations.

Participants discussed feeling reluctant to question GPs about their advice even when it appeared contradictory to advice received from other GPs. Some participants also described problems accessing and affording primary care services

and medication. Other participants had experienced difficulty in finding appropriate first aid supplies for skin infections such as large, non-stick dressings.

Participants were asked where they found health information and from whom they sought health advice. Other than GPs, participants were largely unaware of where or how they could access free health care advice about skin infections from health practitioners within their communities. Some were unsure of the services of PHNs or how to find out about them, and perceived PHNs to be focused on immunisation activities. There was also some reluctance to have a PHN visit parents and caregivers at home (although the reasons for this were not discussed in detail). Participants did not identify school nurses, practice nurses or pharmacists as other sources of health care advice. Nor did they mention Healthline or looking for information on the internet. Participants said they were more likely to ask other family members or friends working in the health sector for advice, or rely on their previous experiences to guide them. A few participants had some knowledge of rongoā (traditional Māori medicine) and homeopathy. Other participants were interested in trying these treatments, particularly as preventive measures. None of the participants had received specialist care for eczema management despite some having children being hospitalised for infected eczema.

3.2.2 Health practitioners interviews

The PHNs interviewed identified that some schools and teachers frequently refer children with skin infections to PHNs while other schools and teachers prefer to recommend to a parent or caregiver that the child see a GP. PHNs and clinical nurse managers described some difficulties created by the way schools introduce the role of the PHN. For example, sometimes schools referred to PHNs as being sent to ‘check-up’ on a family and as a result people can be reluctant to engage with PHNs, especially within a home setting. Conversely, where good relationships exist between a family and a PHN, they are regularly contacted directly by parents and caregivers for help with health matters.

PHNs reported the cost of visiting GPs, filling prescriptions, transport, and time off work as prohibitive for many parents and caregivers. They were aware of instances where children would not tell parents about an infection because their parents are unable to afford the GP visit and medication. PHNs saw medications and dressings not being used as prescribed because parents and caregivers wanted to save them. This issue of poor adherence to treatment plans may also be due to parents and caregivers not having a clear understanding of how medication works. There were also descriptions of children living in multiple dwellings and with multiple caregivers, and experiencing problems in the continuity of their health care that sometimes led to errors such as irregular and incorrect medication dosing.

PHNs described the advice they provide to parents and caregivers as needing to fit the circumstance and priorities of each situation. In some cases parents and caregivers need information about access to services, such as identifying pharmacists in the local area who have very low or no charges, sorting out

appointment times, and the provision of resources such as dressings and creams. Sometimes PHNs tried building understanding of the potential seriousness of skin infections by using known examples such as talking about potential kidney problems and relating this to Jonah Lomu. This strategy is used in situations where a family appears to normalise skin conditions or where an adult does not acknowledge the seriousness of skin infections for children (for instance, where adults also have untreated infections).

Where possible or necessary PHNs work with parents and caregivers to help them understand how to treat and monitor skin infections and prevent the spread of infection. PHNs found children, especially older children, to be very good at monitoring their own skin. PHNs reported describing and demonstrating how to use low cost products, such as soap and diluted bleach, to treat minor skin problems as well as going through activities to help manage skin infections, such as how to wash hands, cutting children's nails, and the importance of not sharing clothes, towels and bedding.

All of the interviewees noted that the more health supplies they are able to provide to parents and caregivers (such as lice combs, soap, dressings, cream, etc.), the more successful treatment becomes. Some PHNs found that providing children's clothing, towels and bed linen was also very helpful in preventing infection in families without the ability to access these resources. However the same PHNs also noted that extra supplies and support assisted with the management of an immediate skin infection, but were less likely to lead to better long-term prevention and management of infections.[1] They noted that the causes of some skin infections are very difficult to manage. For example, scabies prevention requires a whole household approach and a family may not have the resources or facilities to wash all their linen at the same time. Flea infestations and head lice can be similarly difficult to prevent, as well as costly and time consuming to eradicate.

3.2.3 Teacher interviews

Prior to focus groups with parents and caregivers on school premises the researchers spoke to a small number of teachers and other school staff. These teachers were unsure of the services provided by PHNs, other than immunisations, and were more likely to recommend that a parent take a child to a GP than contact a PHN. Teachers identified that sending a child home, or letting a parent know that a child should not attend school until a skin condition had improved (or until the child had obtained a doctor's certificate) was usually sufficient encouragement for a parent to get medical treatment for a child.

3.2.4 Health practitioner surveys

Practitioners and health system representatives were asked why the rates of serious skin infection in children less than 14 years of age are increasing. A majority (89

[1] Interviewees also acknowledged that this was sometimes hard to measure as they often lost contact with families for many reasons.

percent) of the health practitioners and six of the PHO representatives identified poor knowledge amongst parents and caregivers of effective prevention and treatment regimes as the main reason for increasing rates of serious skin infections in children. Parent and caregiver beliefs that skin infections are not serious were identified by many (84 percent) of practitioners and all of the PHO respondents as a contributing factor.

Practitioners also reported poverty as a pervasive barrier to the effective prevention, treatment and management of skin infections. Three-quarters of practitioners identified lack of affordable primary health care, and the cost of prescriptions, transport and time off work as contributing to the increasing rates of serious skin infection. Eighty percent identified other poverty-related factors, such as poor nutrition and overcrowding, as being associated with higher rates of serious skin infections. PHO representatives similarly identified factors of poor nutrition and overcrowding as contributing to higher rates of serious skin infections. However, only two of the seven PHO respondents identified lack of affordable health care as an issue.

3.3 Summary

The health literacy literature review confirmed the central role of health practitioners in building the health literacy of patients. This review also identified that health practitioners, and those designing health systems, need guidance about how to improve the health literacy of patients and families. A key concern from the literature and the health practitioner consultation was that parents and caregivers might not consider skin infections to be serious health conditions. Health practitioners also acknowledged other barriers to parents and caregivers seeking health care, including the cost of health care and the impact of poverty on the living conditions of parents and caregivers.

While a lot of care is taken by parents and caregivers whose children have frequent skin conditions such as eczema (which can become infected), the noticing of other skin infections is more serendipitous with older children being relied upon to tell parents and caregivers about skin problems. Parents and caregivers interviewed suggested that they might be the best people to provide health practitioners with an overview of the child's skin health, particularly for ongoing skin conditions. At the same time, parents and caregivers reported not being asked about the children's skin health history and feeling reluctant, discouraged or unqualified to explore unclear or contradictory medical advice from a GP, especially when they did not have an established relationship with that GP.

Parents and caregivers wanted to know more about skin infections and, given a supportive environment such as the focus groups, were prepared to ask questions of a health practitioner (the project nurse) and researchers. Participants had many questions about skin infections that could be answered by the project nurse, and they enjoyed listening to peers discuss rongoā, homeopathic medicine and their health experiences. Participants appreciated endorsement from the project nurse of

the things they were doing correctly as well as getting new ideas from other participants.

3.3.1 Health literacy demands

The health literacy required by parents and caregivers to manage specific skin infections is extensive and complicated by the fact that many skin infections in children are fast developing short-term conditions, requiring parents and caregivers to understand a lot of new information and activities in a short period of time. It is also easy to forget this information (knowledge) because it may only be needed at irregular and infrequent intervals. The health literacy knowledge and skills required by parents and caregivers also depend on the communication skills of the health practitioners they encounter, and the complexity of the health services and system parents and caregivers are expected to navigate. A description of the health literacy knowledge and skills required by parents and caregivers to manage (a range of) skin infections in children was developed by researchers to inform the resources produced for health practitioners, and parents and caregivers. This document, Health Literacy Demands is in Appendix 4.

Part 4. Interventions to strengthen health literacy

The research into interventions to strengthen health literacy spanned the literature reviews (Phase 1), stakeholder consultation (Phase 2) and resource development (Phase 3). The development of resources was in response to the findings from Phases 1 and 2.

4.1 Phase 1. Literature and resources

The literature was examined for interventions that successfully strengthened health literacy.

4.1.1 Literature review

Communications between health practitioners and patients can be improved so they facilitate health literacy. To minimise the risk of patients not understanding what they read, it is now recommended that all written health care material in the United States be graded to the reading age of a 10 year old (Wilson 2009; Zarcadoolas et al 2006). While using plain language in written material is widely recommended, the validity of this readability approach has been questioned as, apart from the fact that adult patients are not 10 year old children, this approach fails to take account of the important role that sense, logic, familiarity, tone, and cohesion play in the comprehension of a text (Ministry of Health 2012; Rudd et al 2007). Many experts in the health literacy field now claim that the most effective way to improve patient understanding is to support one form of information with another; that is, reinforcing spoken explanations with written materials or supporting written materials with visuals (Weiss 2007). As a result, it is essential that written, spoken, and visual messages are consistent and repeated.

Rethinking how information is given to patients, with the most important information being given first and the rest at a later point, can lessen the cognitive load for all patients and act as a facilitator to improve uptake (Rudd et al 1999). Zarcadoolas et al (2006, p 90) acknowledge the fleeting nature of spoken interactions and for this reason recommend that spoken messages ‘contain facilitators such as brevity, narrative structure and repetition’. Even though there is not much that can be done about information that is received from sources outside the health system, consistency in health and medication messages is important.

As mentioned earlier, Kickbusch et al (2005, p 18) note the importance of cultural relevance and claim that ‘health messages and solutions must be placed within settings relevant to their target audiences and encompass both a social and health dimension’. This reinforces the need for health practitioners to sensitively and appropriately explore what patients know and believe about their health, and use this as the basis for building new knowledge and understanding with a patient. This approach to building knowledge is based on schema theory, a theory about how people represent and organise knowledge in their long-term memory. Schema theory says that people relate new information to what they already know or have

experienced. Schema theory emphasises the critical role of knowledge in understanding our world (Anderson 2004).

Sudore and Schillinger (2009) developed a framework and description for best practice of interventions to improve care for patients with low health literacy. The framework and description are the result of a comprehensive literature review to identify feasible health literacy interventions at the practitioner-patient level, at the system-patient level and at the community-patient level. Although designed to address health literacy levels in the United States, the framework provides a useful starting point for analysing and developing effective health literacy interventions in New Zealand.

Key interventions at the health practitioner-patient level include:

- providing patient-centred communication, where existing patient knowledge and experiences are built on
- prioritising health messages to emphasise important information and not to overload patients with new information
- using clear health communication approaches, including use of plain language
- using effective techniques to confirm patient understanding, including the use of the teach-back method
- reinforcing information, including using multiple modalities and using the patient's support network
- providing clear numeracy and risk information, including providing absolute risks instead of relative risks
- providing medication reconciliation, including simplifying regimens as much as possible, and confirming regimen dosage.

Key interventions at the system-patient level include:

- providing health education materials , including incorporating the target audience in the design of the materials and delivery methods (noting that written materials may not be effective for some patients or may need to be supported with other types of communication)
- providing explanations of medication drug labels, including using concrete examples
- designing disease self-management support systems that need are proactive(?) and disease-specific
- creating an empowering environment, including making signs and forms easy to read and encouraging the patients to use the Ask-Me-3 approach[2]
- clinician training, including health literacy education.

Key interventions at the community-patient level include:

[2] Ask-me-3 was developed by the Partnership for Clear Health Communication and encourages patients to ask three important questions of providers in every health care interaction: what is my main problem; what do I need to do; and why is it important for me to do this?

- referring to adult literacy classes
- using lay health educators/navigators
- using mass media to disseminate health information (Sudore and Schillinger 2009).

Most people with low health literacy do not know they have an issue and, if they do, they are unlikely to tell health practitioners that they have a health literacy problem. To work within this context, health practitioners in the United States are implementing a universal precautions approach to health literacy. Universal precautions in relation to blood-borne diseases is a concept that is familiar to health practitioners; in health literacy the universal precautions concept means health practitioners approach every interaction with health consumers as if the consumers might have health literacy needs. Taking a universal precautions approach means checking the health literacy needs of consumers, providing clear communication (both written and spoken) to all consumers and actively building their health literacy knowledge and skills (DeWalt et al 2010).

4.1.2 Resources stocktake

Resources for patients, parents and caregivers

Resources on every type of skin infection and condition are available from most health centres. The majority of resources are also available online, although due to the multitude of online resources for each skin condition it can be difficult to locate a specific resource without its exact title. Some resources include health and technical terminology with little explanation. Many of the resources require a high level of reading skills as they contain a lot of text and are provided without supporting discussion. Furthermore the internet can be an unreliable source of health information that requires a high degree of health literacy to evaluate the information located, as well as the high degree of digital literacy required to initiate searches then navigate and assess results pages for relevancy. (A list of local and international resources about skin infections and conditions available from credible sources is attached in Appendix 3.)

Resources for health practitioners

There are many skin infection resources for health practitioners, although few describe how to communicate effectively with patients (or parents and caregivers) when discussing skin infections, or how to build health literacy.

The Regional Public Health website for Healthy Skin Greater Wellington provides a comprehensive catalogue of online resources about skin topics for health practitioners, and for health practitioners to share with families and children. Regional Public Health, with assistance from the Healthy Skin Greater Wellington protocols sub-group, has also developed protocols to guide health practitioners and allied workers in the prevention, assessment, management and treatment of common skin conditions. These protocols promote evidence-based practice

designed to reduce skin infections in the community and decrease progression to serious skin infections requiring hospitalisation (Regional Public Health 2012).

Similarly, the Greater Auckland Integrated Health Network (GAIHN) is developing and implementing primary care clinical guidelines for cellulitis and skin infections. It is intended that all those providing primary health care, including practice nurses, PHNs, GPs, Plunket, public health, schools, district nurses and community health workers, will use these guidelines.

In order to improve access to medicines for skin infections the Keeping Well, Healthy Skin Greater Wellington project is encouraging clinical teams to develop standing orders to support implementation of the project's new protocols for managing skin infections. Standing orders can be used to enable registered nurses to administer and supply specified (prescription) medicines in order to improve timely access to treatment.

4.2 Phase 2. Stakeholder Consultation

4.2.1 Focus groups with parents and caregivers

The questions participants asked about skin infections during the focus groups demonstrated gaps in their knowledge of germ theory, infection control and health terminology, as well as how to access primary services and their rights as health consumers. A number were also unsure of first aid procedures such as when and how to dress a wound or infection, particularly on difficult areas such as hands.

Participants wanted information they could keep at home to help them identify/diagnose skin conditions, know 'what to do' to prevent and treat these conditions, as well as recognise the signs that a child needs to visit a GP or other appropriate primary health care practitioner such as a practice nurse or pharmacist. Participants asked for photographs to help identify the differences between types of skin infections and conditions. They also wanted to know more about where to access affordable health advice, particularly who they could talk to when they had questions about skin conditions or minor infections, and what they could do at home to treat and prevent skin infections. Parents and caregivers managing long-term skin conditions such as eczema, allergies, or recurrent skin infections such as boils and scabies, wanted to know where they could get advice about the daily prevention and management of these conditions.

Having resources for parents/caregivers and children that health practitioners could discuss with them, with explanations adapted to ensure the resources were made relevant to the individuals involved, was also identified by parents and caregivers as an important strategy to build health literacy.

4.2.2 Health practitioner interviews

Each of the PHNs interviewed showed the researchers the health information resources they found most useful when working with parents, caregivers and

children. A number of PHNs had also made their own small resources to fill information gaps. Resource preferences were for practical information with pictures. Interviewees emphasised the importance of providing resources in multiple languages to meet the needs of parents and caregivers who have limited English language reading skills. Colourful and fun posters, stickers, and fridge magnets were popular with children. It was noted that health resources were more likely to be retained by parents and caregivers if the resources contained information about the length of time a child needs to be away from school when the child has an illness.

PHNs described running short education sessions for children (and staff) in schools. These sessions are often about prevention or detection of health issues and are designed to build the health literacy of children (and staff). A public health centre has developed complete health lesson plans for PHNs to use in the classroom, and reported that teachers are very happy to use these plans and activities as part of the health curriculum.

PHNs provided input about the usefulness and popularity of resources with parents and caregivers. A double-sided A4 poster about common childhood infections and illnesses was identified as popular with parents and often retained in households, as it had information about a number of common conditions which made it an easy quick-reference guide. The poster also identified the length of time a child was likely to be away from school due to an illness.

4.2.3 Teachers interviews

Teachers reinforced the message from PHNs that lesson plans about skin health would be useful within the primary school sector. Lesson plans on skin health and infections could be used before and during summer to help children understand how to care for their skin during the season when infections are most prevalent.

4.2.4 Health practitioner surveys

Most of the services provided by health practitioners to children related to treating and monitoring skin infections and referral to other health services (such as GPs or hospitals), along with hand-washing and other hygiene advice such as ‘clean, cut, and cover’ messages. Consistent with PHO expectations, health practitioners discussed most aspects of managing skin infections with children and parents, ranging from prevention strategies such as nutrition and hand-washing, to treatment approaches such as how to clean infected skin and take medication, and emergency management such as warning signs and what to do if things get worse.

Most health practitioners provided information to parents and caregivers about skin infections. In addition to talking with children and parents (97 percent), many respondents gave out handouts or leaflets (83 percent) or showed pictures or photographs of infections (56 percent). Health practitioners said that children (90 percent) and adults (74 percent) were the main target groups for this information. Sometimes these resources were discussed during a health consultation, and at other times they were left as reminders or additional advice for parents to review in

their own time. Six of the seven PHO respondents identified best practice guidelines as the main information PHOs supply to practitioners to support effective treatment decisions and service consistency.

Some health practitioners provided or encouraged education in schools, hoping that the children would take information home and educate their parents or caregivers. Some respondents noted that children, parents and caregivers had practices around healing that were no longer considered effective, and had a poor understanding of contagion (germ theory) and skin infections. Comments were also made that children who see a PHN are often better educated than their parents about skin hygiene and preventive measures. Some health practitioners described giving medical supplies to children and families, helping families access subsidies, and made suggestions for improving the accessibility and affordability of health care and supplies, such as PHNs providing antibiotic treatment.

Health practitioners were asked to identify other health conditions being managed effectively by parents and caregivers that might be relevant to the management of skin infections. There was wide feedback that the management of asthma is timely and effective, and that the model used for asthma management might be appropriate for skin infections. The use of an Asthma Action Plan shared between families and schools was described as valuable. Several responses also identified that having a specialist nurse for people with asthma was beneficial for education and management, as a generalist nurse may not have the same expertise. National immunisation campaigns for Meningococcal, HPV and more recently measles and whooping cough, were also identified as effective in changing behaviour with regard to increasing immunisation rates.

4.3 Phase 3. Resource development

Findings from the literature reviews, interviews, surveys, and focus groups as well as discussions with the Reference Group, led to the identification of three main health literacy opportunities for reducing the incidence of serious skin infections and resulting hospitalisations for children. These opportunities involved building health literacy skills and knowledge about:

- why and how to prevent skin infections at home and school, for example through better care of broken skin, breaking the cycle of recurrent infections, and preventing precursors to infection such as insect bites
- why and how to treat minor skin infections at home and school
- why and how to monitor minor skin infections for signs that a child needs to be taken to a primary health care provider.

In addition, parents, caregivers and children need to be able to follow the treatment requirements and advice they receive from a health practitioner, and understand when to revisit a health practitioner if necessary.

Photographic health education resources were developed as a tool for health practitioners to trial with parents and caregivers to build health literacy knowledge

and skills relating to skin infections. Findings from the health literacy literature review informed the development of a range of possible scripts, called Talking Points, for health practitioners to guide their practice when using the health education resources to build health literacy with parents and caregivers. Teaching materials were also produced for health practitioners working in schools as well as teachers to use with children in the school curriculum.

The resources developed are action oriented and focus on what parents and caregivers are likely to see at home, can do at home, and need to monitor when deciding if a child needs to see a GP. The resources can be used at any stage of a skin condition: prevention; early treatment; urgent treatment or healing.

A booklet and poster produced for parents and caregivers show and describe the common skin conditions that lead to skin infections and how each skin condition progresses from the early stages of infection to more serious infection. Skin infections and skin conditions that are common precursors to infection were included in the draft resources: namely: boils and abscesses; cellulitis; chicken pox; cuts, scratches and grazes; eczema; impetigo; insect bites; measles; mumps; ringworm; and scabies. The poster and booklet are based on the popular 'infections and illnesses' poster that provides a one-stop quick reference guide to multiple childhood illnesses. The booklet was designed to provide an easier to read format, and an opportunity to supply more background information (health literacy knowledge) about skin health and infections than the poster.

These resources provide clear photography of skin infections in children. To source photography the researchers approached DermNet NZ, an online resource (www.dermnetnz.org) established by the New Zealand Dermatological Society to provide information about skin diseases, conditions and treatment for patients and their health practitioners, and gained their permission to use some of their images in the draft resources developed for the project. In some cases DermNet NZ did not have suitable photography available, particularly showing the early stages of an infection in young children. In these situations, other photographs were sourced. The Northland District Health Board also agreed to their resource on washing and drying hands being included in the draft resources.

The resources are in colour, use large font and as little text as possible. Phonetic descriptions and common explanations are provided for unfamiliar words. Most of the statements are in clear action-focused language. There is a clear and repetitive design approach used to present each condition. Important points are highlighted. Infographics (pictures to explain concepts) are used to describe basic treatment principles for infection prevention and treatment (clean, cover, check) along with messages such as good nutrition and adequate sleep (incorporated in the booklet).

4.3.1 Summary list of resources

1. An A4 (or A5) booklet with supporting photography for identifying and managing skin infections, *Looking after your child's skin and treating skin infections: A guide*

for parents and families (Appendix 5.). The booklet has pages for each skin condition and can be used to provide an action plan for each condition. There are pictures and information about the signs and symptoms of early-stage infection, along with actions to be taken. There are then signs and symptoms of worsening infection and the immediate actions to take. Each page has a notes section that can be personalised with medicine names and dosages.

2. An A2 poster, *Skin problems in children*, summarising infections, actions, warning signs, and notifications (time off school), for use in classrooms, school offices or with children (Appendix 6.).

3. Talking Points, a guide for health practitioners such as PHNs describing how to use the booklet with parents and caregivers (including children) that can be used with the booklet or poster (Appendix 7.). The Talking Points follow the learning principle that an effective way of building health literacy is to support one form of information with another, in this instance, reinforcing written materials with spoken explanations. The Talking Points model good practice in using a resource to build health literacy (knowledge and skills) through actions such as:

    - checking and acknowledging what parents and caregivers already know about skin infections
    - generating discussion rather than having the health practitioner provide a presentation
    - showing parents and caregivers how to find information in the booklet
    - focusing on action and sequencing instructions
    - recommending demonstration of an activity and getting a parent or child to practise the activity with supervision
    - adapting the actions to suit the context of the parents and caregivers (such as guidance in using everyday household items for treating skin infections)
    - encouraging parents and caregivers to ask questions
    - modelling engagement by helping parents and caregivers prepare questions for their GP
    - encouraging health practitioners to raise related subjects not mentioned in the resource, such as rongōa, home remedies and alternative therapies.

4. Eight lesson plans for skin infections that can be used by PHNs or teachers in schools as part of the health curriculum. Children are an audience for building health knowledge and skills about skin infections within the school environment and this learning can be transferred to home. The lesson plans about germ theory and how the body fights infection build general health knowledge that is relevant to many health conditions. Two lesson plans were translated into the Māori language for review by Kura Kaupapa Māori staff.

4.3.2 Which health practitioners can help build health literacy?

Because of the prevalence of skin infections amongst children, the health practitioners involved in building health literacy with parents and caregivers need to be widely and easily accessible, and have a focus on preventive health care. PHNs were identified as well positioned to work with parents, caregivers and children to build health literacy about skin infections as they already work with schools and in homes to provide health education to prevent infection, and assist children, parents and caregivers during the early stages of skin infections. PHNs are also able to work with parents, caregivers and children with recurrent skin infections, and monitor the treatment of serious skin infections. PHNs are able to provide first aid services and medicine for some skin conditions. Importantly, PHNs provide free services to school age children and are accessible to parents, caregivers and schools.

Community health workers, social workers, school first aid staff, and teachers were also identified as groups that provide freely accessible and preventive health services and self-care information for parents and caregivers. Initially Plunket nurses were also identified as a potential point of contact for pre-school children. However people interviewed did not report contacting Plunket for acute health issues such as skin infections, and were more likely to go to a GP or hospital than contact Plunket.

In this project GPs were not identified as a relevant group of health practitioners as parents and caregivers are unlikely to have contact with a GP prior to deciding whether a child needs to be taken to a primary health care provider. However GPs could reinforce when and why a child needs to be taken to a primary health care provider, and acknowledge when a parent or caregiver has done so.

4.4 Summary

The skills and knowledge parents and caregivers need to make appropriate decisions about when to take a child with a skin infection to the GP requires parents and caregivers to have access to information and support before seeing a GP (although a GP can reinforce good decisions). This is why PHNs, school nurses and community health providers were the groups interviewed about possible interventions, with practice nurses and GPs invited to provide input through the surveys.

Resources about skin infections were requested by and for parents and caregivers as a way to build their skills and knowledge. In particular, photographic resources were identified as a resource need that could contribute to building health literacy. While many resources exist, there are very few hard-copy resources with coloured photographs of skin infections that parents and caregivers could use as a reference point for identifying an infection and the stage of the infection. Photographs of skin infections are more commonly found online; however these tend to show infections in the advanced stages and rarely feature children. In interviews, parents and caregivers asked for photographic resources and instructions about skin infections

and none of the parents and caregivers interviewed reported using the internet as a source of health information about skin infections.

Health practitioners need to think about the content of the health information they are sharing as well as how they communicate this information, by considering what a person already knows, prioritising key health messages, logically sequencing information, and making information relevant. Health practitioners also need strategies to encourage parents and caregivers to participate in health conversations. Health practitioners checking understanding of important health messages while not being confronting or interrogative, and using approaches that encourage knowledge gaps to be identified, are fundamental components of building health literacy.

Health practitioners are able to support the effective health practices of parents and caregivers, develop treatment plans that take into account the realities of managing skin infections, take a long-term holistic view of skin infections with parents and caregivers, use strategies to build understanding, and check that they are communicating effectively. However health practitioners require guidance about how to engage with parents and caregivers in ways that build health literacy, and work in a culturally sensitive and appropriate manner. As a result Talking Points, or possible scripts for health practitioners, were developed for use alongside the photographic resources produced for parents and caregivers (provided in Appendix 7.).

Part 5. Increasing health literacy

This section covers the trialling (Phase 4) of health literacy resources to facilitate the prevention and management of skin infections.

5.1 Phase 4. Resource trialling

5.1.1 Reference group

Resources were initially provided to the Reference Group. Alternative remedies and treatments, such as using antibacterial products, were included in an initial version of the resource. However, the Reference Group pointed out that there was little evidence supporting the effectiveness of most of these remedies. As a result, alternative remedies were removed from the resources distributed for trial.

5.1.2 Health practitioners and teachers

Resources were distributed to PHNs, other health practitioners, and teachers for trial and feedback. Health practitioners used the Talking Points, booklets and posters with parents and caregivers, while both teachers and PHNs used the lesson plans with children. The Ministry of Health also provided feedback on the draft resources. Feedback was gathered from the trial and is provided in full in Appendix 9. The main points from the feedback are summarised below and incorporated in the final draft of the resources.

The poster, booklet and talking points

Health practitioners reported being able to use the resources in ways that engaged parents and caregivers in learning and helped them add to their existing knowledge about skin infections. The resources (and health practitioner practice in using the resources) generated questions and discussion from parents and caregivers about information in the resources and related topics. Following discussions with health practitioners, people asked to keep the resources as they saw them being a useful guide for the future.

Feedback on the use of photography was overwhelmingly positive from health practitioners, parents and caregivers. It was helpful for parents and caregivers to see pictures of a skin condition as it became more serious, along with clear direction about the actions to take. It was noted that some photographs needed to be clearer or provide more typical examples of a skin condition in children. A number of health practitioners reported that parents and caregivers asked for more information on the use of anti-bacterial soaps or similar, and alternative remedies.

Health practitioners reported that parents and caregivers found the language and layout used in the booklet and poster easy to understand. Health practitioners debated which skin conditions should be included in the resources. Health practitioners questioned the inclusion of ringworm, chicken pox, eczema, measles, and mumps, as these are not all skin infections, or common conditions. They also

debated the order in which the skin conditions should be presented within the resources and identified a preference for the most common conditions to be presented first.

Health practitioners requested that the resources be printed in a variety of sizes. Large single-sided, laminated versions of the poster would be useful for school classrooms, offices, and sick bays, while A4 double-sided versions of the poster would be useful for quick reference guides in homes. For the booklet, the A4 size was useful when sitting alongside parents and caregivers and discussing the resource. However an A5 version would be a useful handout to leave with parents and caregivers. To reduce the printing costs of the colour resources it was also suggested that a one-sided A4 sheet for each condition could be produced based on the information in the booklet. This would be practical where health practitioners were printing their own copies of the resources to give to parents and caregivers.

Feedback from the Kura Kaupapa Māori identified that the resources need to be in the Māori language if they are to be used in immersion settings. Health practitioners also requested that the resources be made available in Pacific languages.

Lesson plans

Seven teachers trialled the lesson plans with 188 students. Teachers were positive about the lesson plans and children's responses to the activities. Teachers identified that there is a real need for units like this at all levels. They described the lesson plans as relevant, interactive, enjoyable, and building good health knowledge and practices with children. Teachers also identified multiple opportunities to use the lesson plans throughout the school year.

Teachers suggested additional lesson plans could be developed on topics relevant to older children. Topics included acne and pubertal changes, nutrition, hygiene, and skin products (such as deodorant). It was noted the New Zealand school curriculum for health does not emphasise personal hygiene and responsibility but it could be addressed within the Social Science curriculum areas. Teachers also noted that it would be helpful if the plans were explicitly linked to the New Zealand curriculum.

They asked for more information about hand sanitisers, as this has become a standard part of hygiene practices in many classrooms.

Other feedback

Discussion with representatives from Wellington and Auckland-based projects to improve the prevention and management of skin infections has identified opportunities for the resources developed in this project to be incorporated into these regional initiatives.

5.2 Summary

5.2.1 Poster, booklet and talking points

A positive indicator from parents and caregivers of the acceptability of the resources was the requests received from parents and caregivers for the resources. Having resources to take home would enable parents and caregivers to regularly refer to the resources and will help reinforce good practice and understanding of skin infections. This is the foundation of building health literacy and changing health practices.

The feedback from the trials was discussed with the Reference Group and incorporated in the final version of the resources. The feedback about the conditions included in the resources resulted in the following revisions:

- Ringworm and eczema are in the poster and booklet, as these are common skin conditions which can lead to skin becoming infected.
- Chicken pox is in the booklet but is omitted from the poster, as the photography is too small in the poster to be useful for identification.
- Measles and mumps have not been included in the resources as these are less common causes of skin infections.

As the resources are designed to be left with parents and caregivers who are unlikely to know the frequency of all skin infections, it was decided to retain alphabetical ordering, as this is a more familiar system of organisation for parents and caregivers.

While the DermNet NZ (and other) photographs seldom feature children or Māori, they were adequate for the draft resources. Since the trial of the draft resources, the project was approached by the Greater Auckland Integrated Health Network (GAIHN) as GAIHN was also carrying out a skin health project. GAIHN offered to supply new and appropriate photography for the booklet and poster in order to hasten the finalisation of the resources so that they could be distributed to health providers in GAIHN. GAIHN produced new photographs which better demonstrate specific infections in Māori and Pacific children, and sought clinical approval of the photographs from their clinical leadership group. The booklet and poster have been produced using photography from GAIHN, including some images purchased by GAIHN from DermNet NZ. Three images in the booklet, on pages 7, 13 and 22, and also used in the poster have been supplied by a paediatrician and Reference Group member. These three images do not identify a child and have been used in other public presentations in New Zealand and overseas. However, we have been unable to source written permission to use these images from the subjects in the photographs.

In considering the overall feedback and purpose of the resources the Reference Group also identified that a third set of photographs and instructions could be included in the booklet for each skin condition to describe the signs of healing or improvement. This was weighed up against the audience preference for large pictures and font and a desire not to over-crowd each page with information.

However if the format of the booklet changed, including this information may be possible. There was some feedback that the resources could be produced in other formats such as flipcharts or video resources, however the merits and potential uses of these formats would require further investigation.

There are many challenges in developing guidance around the merits of products such as anti-bacterial soaps and alternative therapies. In particular the resources take a clinically based, factual and directive approach at present, and discussion of alternative remedies would require a divergent approach because of the lack of evidence to support these remedies. While it was decided not to include alternative remedies in the final draft booklet health practitioners are encouraged, via the Talking Points, to explore what other remedies parents and caregivers have tried and acknowledge what parents and caregivers are doing well, which includes discussing alternative remedies.

Where feedback could not be applied within the parameters of the current research project, such as where better photography of skin infections was required, recommendations are made for future revision of the resources.

No specific feedback was received from health practitioners about the Talking Points. These are a key resource for improving the practice of health practitioners in building health literacy with parents and caregivers. Some PHNs reported not receiving the Talking Points from their managers and this may reflect that these health practitioners did not understand the purpose of the Talking Points, or may believe PHNs already know how to build health literacy with parents and caregivers. Thus it could be helpful to emphasise the role of the Talking Points and endorse current good practice when the resources are released, for example through training for health practitioners, focusing on how to engage and empower parents and caregivers to build health literacy (knowledge and skills) using the resources.

5.2.2 Lesson plans

By helping children build their health literacy in relation to skin hygiene, skin health, and germ theory, the lesson plans support a growing understanding of prevention and early treatment of skin infections. The plans provide an additional benefit of encouraging children to be comfortable talking about skin infections and gave them the language to discuss skin conditions.

5.2.3 Recommendations

During the course of this project opportunities have been identified for increasing health literacy in relation to the prevention and management of skin conditions and infections through improving existing skin health resources and using the new resources developed during the project.

Existing resources regarding skin conditions could be improved by ensuring messages reflect the clinical guidelines or evidence-base available, adding photographs of skin infections, and further explanation of the complex and difficult

concepts in the resources. Guidance about how a health practitioner can work through a resource with parents and caregivers would also be beneficial.

With regard to the resources developed and trialled during the project, the following recommendations are made:

1. Publishing the skin infections booklet and poster using photography that depicts Māori children and parents and caregivers (noting that parents and caregivers interviewed during the project wanted hard copy resources rather than online material).
2. Publishing the Talking Points as a model of good practice in using a resource to build health literacy and seeking further feedback on the Talking Points (scripts) from health practitioners to determine how they are being used and could be improved.
3. Encouraging the use of the Talking Points through professional development for health practitioners, focusing on how to use the resources to engage and empower parents and caregivers to build health literacy and improve the prevention and management of skin infections.
4. Distributing hard copies of the booklet, poster and Talking Points to primary healthcare providers.
5. Making the lesson plans available online for health practitioners and teachers to use in schools.
6. Publishing the lesson plans about germ theory and how the body fights infection as these provide relevant background knowledge for many health conditions, and hard copy resources will encourage uptake by schools.
7. Producing the lesson plans and poster in the Māori language so that they may be used in Kura Kaupapa Māori and wharekura.
8. Consider developing and publishing resources that were requested by participants:
    - an extended version of the booklet and poster, including other skin conditions or childhood illnesses, and/or a section describing what healing looks like
    - guidance about home or alternative remedies.

Part 6. Discussion

It is now widely accepted that health literacy reaches beyond the ability of the individual patient. It is about the communication skills of the health practitioners a patient is interacting with, and the ability of other stakeholders, such as health organisations and media, to provide health information and services in ways that are appropriate for that individual (Institute of Medicine 2004). Health literacy is therefore a product of the convergence of numerous factors and stakeholders (Rudd et al 2007; Koh et al 2012).

In order to reduce the number of serious skin infections and skin infections requiring hospitalisation there needs to be improved prevention and treatment of skin conditions by parents and caregivers at home as well as more timely access to primary health care. Improving the health literacy skills and knowledge (in relation to skin infections) of parents and caregivers will contribute to improved prevention and treatment of skin infections in children. The aim of the present research was to identify and assess the effectiveness of health literacy interventions for strengthening the prevention and management of skin infections in Māori children less than 15 years of age. This was achieved through identifying health literacy barriers and facilitators, highlighting interventions, and demonstrating how health literacy might be increased in order to improve outcomes associated with skin infections.

Health practitioners play a key role in building health literacy with parents and caregivers by involving, engaging with, and empowering parents and caregivers to learn more about skin infections. The parents and caregivers who participated in this research were motivated to do so because they wanted more information and advice about all types of common skin infections, how to prevent and manage infections for their children, and where to access health services and advice. Responding to this demand from parents and caregivers is a health literacy opportunity.

Skin infection resources for parents and caregivers that can be used by health practitioners to build health literacy skills and knowledge were developed and trialled during the project. Parents and caregivers were very receptive to the resources and the discussions these generated with health practitioners. Using resources in this way can make a significant contribution to building health literacy.

Guidance about how to use the resources to building health literacy with parents and caregivers was also provided for health practitioners. While there was awareness amongst health practitioners of the value of good resources for parents and caregivers, there was less awareness of how health practitioners need to use resources (or other strategies) to build health literacy. Unfortunately, little feedback was received on the guidance resources for health practitioners and more investigation is needed to determine whether the guidance was effective, plus when and why health practitioners did not implement it.

Health guidance and advice for parents and caregivers needs to be easily accessible if parents and caregivers are to receive the regular and sustained support needed to build health literacy skills and knowledge for skin infections. PHNs, community health workers, and similar health practitioners are accessible to parents, caregivers and children and ideally placed to help improve health literacy. Schools also provide an important access point for building health literacy amongst children, and supporting the health literacy of parents and caregivers.

6.1 Limitations of the research

The impact of health literacy

The potential for health literacy interventions to improve the prevention and management of skin infections must be seen within the context of socio-economic factors that contribute to increased rates of infection (such as household crowding, poor diet and the affordability of health care and medical supplies). Health literacy is not a panacea for all health issues. However it is important that low health literacy be removed as a barrier to providing and accessing adequate health care and making appropriate health care decisions.

The parents and caregivers who participated

Parents and caregivers from three low decile schools were invited to small focus group discussions about skin conditions with the researchers. The majority of parents and caregivers who attended the focus groups had children who suffer from eczema. These participants were particularly interested in skin health because of their ongoing management of eczema and the ever-present threat of infection. The participants were more likely to regularly check children's skin for eczema and quickly identify when eczema became infected. As such, their behaviour in relation to monitoring skin health of children may not be typical of all parents and caregivers. At the same time, the participants did not demonstrate more knowledge about other skin infections than other people who participated in the focus groups, and so the resources developed in the project include information that is relevant to all parents and caregivers.

The health practitioners who participated

The majority of health practitioners interviewed or who responded to surveys came from Auckland, Counties Manukau and Waitemata DHBs. This may be because the researchers were primarily based in Auckland and actively promoted the project through their local health networks. This could be considered a limitation for the project because it does not reflect a national situation. However each of these DHBs have identified high rates of skin infection amongst children, high rates of hospitalisation for skin infections, and two of the DHBs serve rural as well as urban communities.

The lack of literature about health literacy and skin infections

An initial search for literature specific to skin infections and health literacy (for adults or children) produced no relevant results. There is also little research specific to the health literacy of children, or interventions to improve child health outcomes for children of parents with low literacy (Sanders et al 2009; Yin et al 2007). Due to a lack of research specific to the project topic, separate literature reviews were undertaken in relation to: the causes of skin infections and potential interventions amongst children and adults; health literacy research focused on adults; and access to primary health care for adults and families. The results of these reviews informed the resources developed within the project. However the project was more reliant on the ideas and feedback of parents and caregivers, health practitioners, teachers and the Reference Group when identifying potential health literacy interventions that might be effective.

6.2 Future research

The current research project has combined the literature on health literacy and skin infections to identify barriers to parents and caregivers preventing and managing children's skin infections, alongside opportunities for health literacy driven interventions to improve prevention and management. The parent and caregiver oriented resources developed were acceptable to parents and caregivers and the feedback from health practitioners on their use of the resources with parents and caregivers enabled the resources to be revised by the project clinical Reference Group. Acceptability and face validity are the first step in the testing of new resources. The question now is if they are acceptable and useful for parents and caregivers, will they help facilitate health literacy and lead to better prevention and management of skin infections?

6.3 Other interventions to prevent and manage skin infections

In addition to resources, parents and caregivers need regular, easy access to health guidance and expertise in order to build the health literacy knowledge and the skills needed to prevent and manage skin infections. Furthermore, health practitioners need to communicate effectively with parents and caregivers in ways which build understanding and discussion. In the course of this project parents and caregivers, health practitioners, and the Reference Group identified possible interventions relevant to the successful reduction of serious skin infections but outside the health literacy focus of the project. These were as follows:

- The promotion or development of national clinical guidelines for skin conditions and protocols to support the use of clinical guidelines in primary health care settings.
- The promotion of standing orders, as a mechanism for registered nurses operating in school and community settings, to supply medicines for skin infections in order to improve timely access to treatment.

- The provision of more accessible, affordable primary care services including after-hours care, such as the increased availability of nurses in the community (nurse led clinics, nurse practitioners) and free primary health care for children up to 18 years of age.
- The promotion of the range of primary care services available in each DHB region for parents, caregivers and children (distributed via schools and primary health care practices).
- Improved cultural responsiveness of the health workforce.
- Better recognition of the long-term nature of skin infections or skin conditions and the associated (primary care) planning and support needed for parents and caregivers to effectively manage skin health.
- The establishment of national targets for lowering rates of serious skin infections, such as halving serious skin infections for children under 18 by 2020.
- Regular monitoring and reporting on these targets at the PHO and DHB level (including better involvement of the primary care sector in taking responsibility for decreasing hospitalisations for skin infections).
- Encouraging greater regional public health involvement in skin health, such as activities of the Healthy Skin Greater Wellington group.

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Part 8. Appendices

Appendix 1. Literature review: Health literacy

Glossary

Adult Literacy and Life Skills Survey (ALLS)	A second literacy survey undertaken by the Organisation for Economic Co-operation and Development (OECD) in a number of countries which measured health literacy. The ALL Survey was undertaken in New Zealand in 2006.
Anticoagulation therapy	Therapy which stops the blood thickening and clotting.
Ask-Me-3	A framework of 3 questions that patients are encouraged to ask their health professional to build the patient's health literacy: www.minuteclinic.com/ask_me_3
Chronic disease	A disease that develops over a long period of time and is the leading cause of deaths in New Zealand.
Conceptual knowledge	Understanding what something is.
Critical thinking	Thinking that involves judgement, analysis and questioning.
Glycemic control	Controlling blood sugar levels.
Health literacy	The degree to which individuals have the capacity to obtain, process, and understand basic health information and services needed to make appropriate health decisions which is influenced by health professionals, healthcare organisation sand the health system.
International Adult Literacy Survey (IALS)	A first literacy survey undertaken by the Organisation for Economic Co-operation and Development (OECD) in a number of countries. The IAL Survey was undertaken in New Zealand in 1996.
Numeracy	The ability to apply knowledge of numbers to everyday tasks.

The changing face of health care

The sphere of health has extended far beyond its traditional confines and has become a much broader, complex concept. There is an ever-increasing amount of health information available to patients and more choice in treatment options. Health care systems are now far more complex than before and encompass a broader range of providers. Health is no longer confined to clinical settings but is now a regular feature in print and social media, television and radio (Kickbusch et al 2005). Health now includes what we eat and drink, how much we sleep, and exercise and how we manage stress and emotions.

As the sphere of health continues to grow and become more complex, the relationship between the health system and the health consumer also continues to change and evolve. According to Zarcadoolas et al (2006) examples of this new dynamic include health instructions no longer going unchallenged, and dialogue replacing monologue as the typical pattern of communication between health provider and patient. One of the drivers for this change is the growth of chronic diseases. Zarcadoolas et al (2006, p 40) state that individual health behaviour is a far greater factor in rates of death and disability in the United States than biomedical advances, and that the '21st century will likely see a dramatic increase in death and disability from chronic diseases related to lifestyle'. The combination of increasing rates of chronic disease and an ageing population means that health care is becoming increasingly expensive. Increased rates of chronic disease result in increased and recurring hospital admissions and the necessity of ongoing care, all of which are a huge drain on scarce resources. This rise in rates of chronic disease coupled with the rising cost of health care provision means that doing more with less has become the norm in most health settings.

As part of doing more with fewer resources patients now find themselves having to do more self-management of their health conditions and being increasingly responsible for adherence to long-term health regimes and self care in a complex health system (Pignone et al 2005; Koh et al 2012). As the need to self manage conditions increases, especially chronic conditions, patients are required to develop new skills to find and manage information, understand and manage their rights and responsibilities, and make health decisions for themselves and others (Institute of Medicine 2004). The need to become informed, engaged and active consumers of health means that there are far greater demands being placed on patients (Kickbusch et al 2005). The Institute of Medicine (2004, p 3) states that 'underlying these demands are assumptions about people's knowledge and skills'. A host of national and international research shows these assumptions to be faulty as evidence from around the world demonstrates that patients' knowledge and skills are usually below those demanded of them by their health system (Rudd et al 1999; Rudd et al 2007). As Koh et al (2012, p 435) state 'a wide chasm often separates what providers intend to convey in written and oral communication and what patients understand'.

a. Defining health literacy

It is now commonly accepted that literacy is a major determinant of health status (Nutbeam 2008; Institute of Medicine 2004; Zarcadoolas et al 2006; Kickbusch et al 2005; Rudd et al 1999; Rudd et al 2007). To be able to understand, interpret and analyse health information a patient needs to draw on their general literacy and numeracy skills. These include basic print literacy (the ability to read, write and understand printed language), oral literacy (using speaking and listening skills to communicate with health providers), and numeracy (the ability to apply numerical knowledge to everyday tasks) (Weiss 2007; Institute of Medicine 2004). However having the ability to make the right decisions about health in the context of everyday life, or having good health literacy, goes far beyond general literacy skills because it

requires advanced skills needed to interpret, evaluate and act on health information (Kerka 2000; Zarcadoolas et al 2006). Although literacy and numeracy skills play a significant role in health literacy, health literacy is influenced by many factors, making it a more complex construct than literacy (Speros 2005, Zarcadoolas et al 2006).

The US Department of Health and Human Services (2000, p 11) defines health literacy as 'the degree to which individuals have the capacity to obtain, process, and understand basic health information and services needed to make appropriate health decisions'. The essence of this definition lies with the ability of the individual to obtain information (Rudd et al 2007). However health literacy goes beyond this and 'emerges when the expectations, preferences and skills of individuals seeking health information and services meet the expectations, preferences and skills of those providing the information and services' (Institute of Medicine 2004, p 2). The 2010 report *Kōrero Mārama: Health Literacy and Māor*i acknowledges that the term 'health literacy' is widely used and encompasses a variety of definitions and ideas. This report refers to the earlier definition from the US Department of Health and Human Services (see above) and states that 'Health literacy is essentially the skills people need to find their way to the right place in hospital, fill out medical and insurance forms, and communicate with their health providers' (Ministry of Health 2010, p 1). Of equal significance are the communication skills of health practitioners people interact with, and the ability of various other stakeholders, including the health system, the media and the market place, to provide health information and services in a way that is appropriate to that individual (Institute of Medicine 2004).

Health literacy is an outcome of both individual and social factors (Kickbusch et al 2005; Zarcadoolas et al 2006). An individual's health literacy status is mediated by a range of factors, including literacy levels, socio-economic status, and cultural beliefs and attitudes. Kickbusch et al (2005, p 9) emphasise that health literacy is both an active and dynamic construct and claim that individuals with high levels of health literacy are in 'continuous exchange and dialogue with their environment'. As society changes, so too must individuals learn new information and discard outdated information in order to successfully navigate the health system and make sound health decisions. Similarly, Edwards et al (2012, p 151) emphasise the complex social and changing nature of health literacy by defining it as a 'multi-dimensional construct that develops over time, across different health contexts and through social interactions'. The authors see health literacy as developing along a continuum towards greater knowledge, greater self-management and greater participation in decision making, and existing as both a process and an outcome. Zarcadoolas et al (2006) also see health literacy as operating on a continuum with health literacy levels evolving over a lifetime affected by health status and demographic, socio economic, and cultural factors.

b. Consequences of low health literacy

Health literacy is likely to be a key factor in health disparities (Kickbusch et al 2005; Baker et al 1998; Nutbeam 2008; Zarcadoolas et al 2006; Institute of Medicine 2004; Ministry of Health 2010). Poor communication between the patient, the health

provider and the health system is likely to contribute to disparities in patient understanding of their health status, their health condition, the procedures for prevention, management and treatment of their condition, and their subsequent utilisation of health services (Rudd et al, 1999). Highlighting this correlation, the American Medical Association (1999, p 554) found health literacy to be ‘a stronger correlate of health status than education level and other socio-demographic correlates’. Similarly, the Institute of Medicine (2004) claims that any reduction in health disparities requires a simultaneous improvement in health literacy levels. Kickbusch et al (2005) refer to health literacy as a building block or pathway to health, with low health literacy levels being a strong factor in health disparities. Just as low literacy is seen to contribute to low health status, so too is low health literacy seen to contribute to socio-economic disadvantage, and an inability to engage with and achieve health and wider life goals (Kickbusch et al 2005).

There is a large and growing body of research linking low health literacy levels to low health knowledge and adverse health behaviours and outcomes (Koh et al 2012). In addition to higher health care costs these outcomes include a decreased likelihood of using screening or preventive measures, a decreased likelihood of being adherent to medication regimes, a decreased likelihood of successful self-management of chronic conditions, a decreased likelihood of involvement in consultation and decision making, and an increased likelihood of using emergency services (Ministry of Health 2010; Kickbusch et al 2005; Fetter 2009; Zarcadoolas et al 2006; Nutbeam 2008; Edwards et al 2012). Zarcadoolas et al (2006) refer to health policy reports such as *Healthy People 2010* that show a strong link between low education, low literacy and poor health, and list the consequences of low health literacy as including financial costs to both individuals and the health system, lack of social empowerment and self efficacy, and an increased risk in emergency situations. More specifically they claim that ‘people with low or inadequate health literacy find it difficult, if not impossible, to accurately read instructions for taking medications, understand their health plan restrictions, understand and act on public health warnings, or accurately read evacuation plans and other emergency information’ (Zarcadoolas et al 2006, p xv).

Nutbeam (2008) highlights growing evidence of a robust relationship between low literacy levels and a declining use of health information and services. The Institute of Medicine (2004, p 7) highlights studies that show a clear relationship between low health literacy and a number of adverse health behaviours, including ‘decreased ability to share in decision making about prostate cancer, lower adherence to anticoagulation therapy, higher likelihood of poorer glycemic control, and lower self-reported health status’. These relationships are reinforced by additional studies that link low literacy to poorer adherence to medication regimes (such as with anticoagulant therapy), decreased ability to identify medications, higher rates of misunderstanding of instructions on prescription drug labels and an increase in medication error rate. In addition, a patient with low health literacy is not likely to access medical care in a timely manner, which in turn can lead to negative health outcomes (Estrada et al 2004; Kripalani et al 2006).

Low health literacy is often referred to as ‘a silent killer’ or ‘a silent epidemic’ as it is less diagnosed and treated than more visible medical conditions. Instead of referring to low health literacy, terms such as ‘decreased compliance’, ‘non adherence’ or ‘DNA - did not attend’ have been used to describe a patient’s inability to follow a prescribed health process, appointment schedule, or treatment regime. These terms may mask an underlying health literacy issue (Zarcadoolas et al 2006; Institute of Medicine 2004). Advancements in the field of medical science therefore risk being diminished without improvements in the field of health literacy and the growth of a health literate society (Institute of Medicine 2004). Kickbusch et al (2005) highlight the significance of health literacy in today's society by stating that health literacy is simultaneously an essential life skill, an urgent matter for public health, a critical economic issue, and an important part of social capital.

c. Who is affected by low health literacy?

Although low health literacy can occur in a range of populations it is most likely to occur in the elderly, those with limited education, those with limited income and those with limited language proficiency (Institute of Medicine 2004). Zarcadoolas et al (2006) highlight the frequent use of education levels as a proxy for literacy levels, and refer to the 2003 Canadian report from the International Adult Literacy Survey (IALS), which claims that, while there is a strong correlation between education and literacy levels, this correlation is not exclusive.

New Zealand took part in the 2006 Adult Literacy and Life Skills Survey (ALLS). This survey found that the majority of New Zealand adults do not have the minimum levels of literacy to meet the demands of everyday life and work (Ministry of Health 2010). Data from the health-related items (linked to health promotion, health protection, disease prevention, health care maintenance and system navigation) in the 2006 ALLS survey shows that ‘overall the majority of New Zealanders are limited in their ability to obtain, process and understand basic health information and services in order to make informed and appropriate health decisions’ (Ministry of Health 2010, p iii). In addition, data from the ALLS survey found Māori to have much lower health literacy levels that non-Māori, regardless of other demographic factors such as age, gender, income, and educational status, and that Māori in the 50-60 and 19-24 years age groups had the lowest levels of health literacy (Ministry of Health 2010). Although Māori have the lowest level of health literacy in New Zealand, it is important not to view this as solely a Māori issue as non-Māori, non-Pacific people are the largest group with low literacy (Ministry of Education 2008; Ministry of Health 2012). This situation is reflected internationally, including in the United States where the majority of adults with low literacy are white, native-born Americans, as this group represents the largest section of the overall population (Vernon et al 2007).

There are a number of behaviours that may indicate a person has low literacy, although these on their own do not constitute evidence of low health literacy. These indicators include: regularly missing medical appointments, ignoring or misunderstanding health instructions or advice, asking a number of or alternatively

no questions, arriving with incomplete forms, avoiding filling in forms or taking additional spare copies, and making excuses about forgetting their glasses and needing to read the information at home (Weiss 2007). In addition ‘patients rarely identify themselves as struggling with literacy issues’, and they also seldom ask for assistance in reading health related materials (Rudd at al 1999, p 183).

It is also important to distinguish between patients who have ongoing health literacy problems from those who have episodic health literacy problems. Patients who have low health literacy will have ongoing difficulties in making informed health decisions, whereas most people will at some point in their lives experience an episode of low health literacy. As described above, although general literacy skills are the strongest factor in health literacy levels, these skills are not the only factor that affect our 'capacity to obtain, process and understand basic health information and services needed to make appropriate health decisions'. The Institute of Medicine (2004, p 11) illustrates this point well, claiming that ‘even highly skilled individuals may find the systems too complicated to understand, especially when these individuals are made more vulnerable by poor health’.

d. Causes of low health literacy

There is ongoing research into the causes of low health literacy. Fetter (2009) identifies, among other factors, low education levels, poverty, aging, limited English language proficiency, physical, mental and learning disabilities, poor communication, overuse of medical jargon in patient documents, and cultural insensitivity. At the level of each individual patient, factors such as linguistic, cognitive, visual and aural impairment clearly affect health and literacy levels. However the Institute of Medicine (2004) warns against viewing health literacy as a concept that begins and ends with the abilities of individual patients, and instead argues for it to be viewed as arising from a convergence of socio-cultural factors, health care and education systems, and the barriers contained in those systems.

e. Culture and health literacy

The role of culture in health literacy is widely accepted. Zarcadoolas et al (2006) state that as a component of health literacy, cultural literacy (i.e. the ability to understand and use culture and social identity to interpret and act on information) is clearly needed by all stakeholders in order to improve health care and health outcomes. Kickbusch et al (2005) mirror this sentiment and state that culture (including the culture of the health system) affects attitudes, perceptions and behaviours at both the patient and provider end, or for both those receiving and delivering health services, with this including health information, messages, treatment, decisions and actions. Culture is constantly changing and evolving so health care encounters are a mix of differing and evolving perceptions, beliefs and behaviours. As the Institute of Medicine (2004, p 9) states, ‘these culturally influenced perceptions, definitions and barriers can affect how people interact with the health care system and help determine the adequacy of health literacy skills in different settings’. Furthermore, the Institute claims that health literacy is not just

shaped by cultural differences between patients and providers but also between those who create the health messages and those who use them. Socio-cultural factors are therefore important for public health campaigns and messages, especially when vulnerable groups are being targeted. Kickbusch et al (2005, p 18) argue for the importance of cultural relevance; namely, that ‘health messages and solutions must be placed within settings relevant to their target audiences and encompass both a social and health dimension’. A one-size-fits-all health campaign may be cost effective in the short term but not in the long term as it will rarely reach its target audience (Kickbusch et al 2005; Zarcadoolas et al 2006).

f. Who is responsible for developing health literacy?

Since it is now widely accepted that health literacy reaches beyond the ability of the individual patient and is a product of the convergence of numerous factors, it follows that the responsibility for improving health literacy levels is shared among the various stakeholder groups in health care. These stakeholders include the individual patients, the health practitioner and the wider health system (Rudd et al 2007; Koh et al 2012). Bryan (2008) asserts that efforts to curb low health literacy in the United States need to take place at local, regional and national levels, and the United States Institute of Medicine (2004) states that health providers have a key responsibility in this area, suggesting that it is their skills and expectations that actually drive health literacy levels. Edwards et al (2012) reinforce the central role of health practitioners, stating that it is the capacity of health practitioners to empower or disempower patients that can either facilitate or limit health literacy. From a New Zealand perspective, Kōrero Mārama includes a statement that instead of viewing health literacy as an issue for the individual patient, where the onus is on the individual to lift their skills, the solution lies in a concerted effort from all sectors including schools, government agencies, and the health care system (Ministry of Health 2010).

The ethical dimensions of health literacy (for example health disparities), are reflected in New Zealand by Right 5 of the Code of Health and Disability Services Consumers’ Rights Regulation 1996, which gives every consumer the right ‘to effective communication in a form, language and manner that enables the consumer to understand the information provided’ (Knight 2006, p 4). Clear and effective health communication is a patient’s right, so addressing poor health literacy is a responsibility for all stakeholders in the health care system. However health literacy is more than improving access to information, quality of information and information flow between individuals, communities, health practitioners and the health system. More importantly health literacy is about the skills and knowledge of individuals, parents and caregivers, and communities, so that they synthesise the information they receive from both the health system and other sources, decide whether they have enough information and if not gather more, and then act on the information. This concept of empowered self care runs alongside the process and outcome of becoming more health literate.

g. Approaches to health literacy

Nutbeam (2008) investigates two different approaches to health literacy that conceptualise it either as a risk that needs to be managed or as an asset than needs to be built upon. There are key differences in the way the two models view health education.

The risk model used to be prevalent in the United States, and sees low literacy skills as a potential risk factor that needs to be managed and minimised. The risk model focuses on getting patients to become compliant with recommended clinical care, and is therefore mostly applied in clinical settings. In the risk model, health education is more goal-directed and the health practitioners are focused on what can be done to minimise the risk of their patients not understanding the information or advice they give them. Nutbeam (2008, p 2073) explains that according to this perspective 'the effects of poor literacy can be mitigated by improving both the quality of health communications, and a greater sensitivity among health practitioners of the potential impact of low literacy on individuals and in populations'. The risk model requires an assessment of the individual's literacy levels so that the proper interventions can be put in place. In the United States, health literacy assessment tools such as the Rapid Estimate of Adult Literacy in Medicine (REALM) or the Test of Functional Health Literacy in Adults (TOFHLA) are frequently used to screen patients for low health literacy. The validity of these tests has been criticised as they only measure health literacy in terms of reading at the individual word level and do not include other critical skills such as conceptual knowledge, listening, speaking, and numeracy, all of which are needed to get a true picture of a patient's health literacy level (Zarcadoolas et al 2006; Institute of Medicine 2004).

The asset model is closely linked to health education and sees health literacy as an outcome of personal empowerment in decision-making. Improved health knowledge, along with the competence to put that new knowledge into action, will enable individuals to gain greater self control over their health and the health decisions they need to make. This in turn will make them more health literate. The asset model of health literacy draws on principles of adult education and requires educators to draw on the patient's prior knowledge and experience. Starting with what the patient knows about their condition opens the door to increased interaction, participation and critical thinking, all of which are positive for health literacy (Nutbeam 2008). The asset model can be applied outside health care settings, including schools and community development programmes and offers great potential for enabling positive health actions. The asset model, while powerful in theory, has not yet been widely implemented. This could be due to the fact that it has not been as well tested through systematic research as the risk model (Nutbeam 2008).

h. Barriers and facilitators in health literacy

This section outlines barriers and facilitators to health literacy. Information on each barrier also includes how that barrier could be overcome (or what facilitator could be used), to achieve greater health literacy.

Difficulty in reading materials and difficulty in communicating with health care providers are two major health literacy barriers that individuals face when they access and use the health care system (Rudd et al 1999). Kickbusch et al (2005, p 9) assert that ‘access to good reliable information is the cornerstone of health literacy’ yet most health related material is written at a level beyond what most patients can understand (Kickbusch et al 2005; Levandowski et al 2006; Zarcadoolas et al 2006, Rudd et al 1999; Rudd et al 2007). To minimise the risk of patients not understanding what they read, it is now recommended that all written health care material in the United States be graded to the reading age of a 10 year old (Wilson 2009; Zarcadoolas et al 2006). While using plain language in written material is widely recommended, the validity of this readability approach has been questioned as, apart from the fact that adult patients are not 10 year old children, this approach fails to take account of the important role that sense, logic, familiarity, tone and cohesion play in the comprehension of a text (Ministry of Health 2012; Rudd et al 2007).

Another major barrier to health literacy is an overload of information. There is a vast amount of health information available to patients, from an equally vast number of information sources, which can make finding and understanding the right information difficult (Kickbusch et al 2005; Zarcadoolas et al 2006; Institute of Medicine 2004). Rethinking how information is given to patients, with the most important information being given first and the rest at a later point can really lessen the cognitive load for all patients and act as a facilitator to improve uptake (Rudd et al 1999).
An additional outcome of an increase in information is a decrease in the consistency of the information. These days it is not uncommon for patients to get conflicting information from their information sources including their health care practitioners, the health system, the media and their family and friends. Even though there is not much that can be done about information that is received from sources outside the health system, consistency in health and medication messages is important. This barrier to health literacy is underscored by Eagle et al (2006) who found that consistency of advice between doctors and pharmacists was rated as very important by a sample of patients.

The quality of oral interactions between patients and their health providers is crucial to health literacy. Spoken language is our main form of communication, so patients who have trouble reading may better understand a spoken message. Spoken interactions are also context-rich and rely on more than words to communicate information and meaning, with tone, body language and gestures all playing an important part (Zarcadoolas et al 2006). On the other hand, speech is ephemeral and once the interaction is over there is nothing left except the memory (which may be incomplete) of what was said (Vandergrift 2006). Zarcadoolas et al (2006, p 90) acknowledge the fleeting nature of spoken interactions and for this reason recommend that spoken messages ‘contain facilitators such as brevity, narrative structure and repetition’.

Kelly and Haidet (2007) claim that many health care providers overestimate the health literacy levels of their patients. This leads to a lack of tailored communication which in turn leads to information that is beyond the understanding of the patient, with the potential outcome of non-adherence to a treatment plan. Many experts in the health literacy field now claim that the most effective way to improve patient understanding is to support one form of information with another, i.e. reinforcing spoken explanations with written materials or supporting written materials with visuals (Weiss 2007).

Facilitators for health literacy, which health practitioners can use, include:

- using face to face opportunities to give medical advice as much as possible
- using the teach-back method to check patient understanding, which involves the health practitioner taking responsibility for the clarity of the communication by asking the patient to explain or demonstrate what the health professional has said
- reading written materials with patients or supporting the materials with verbal explanations supporting oral explanations with pictorial material or visual aids
- using plain language in spoken and written texts and making materials easier to use through a greater consideration of design, font, layout and pictures (Rudd et al 2007; Weiss 2007).

Rudd (2007, p 183) cites recent medical and public health reports which recommend that future studies in the area of health literacy 'continue to include – but move beyond the doctor-patient encounter ... and include investigations into health-related activities at home, in the workplace, in the community, and in a range of health systems and care settings'. In addition, Rudd highlights the importance of attention to the broad range of skills involved in health literacy, including a closer examination of patient information-seeking skills. Other areas which Rudd considers could facilitate better health literacy, and which require closer attention, include:

- considering the importance of patient background, knowledge and experience in health related activities and paying attention to assumptions that information-givers have about these
- considering the value that new technologies can add to the field of health literacy (Rudd et al 2007).

Although good knowledge of a health condition is essential for good health literacy, improved patient knowledge will not always lead to the desired change in behaviour. Kickbusch et al (2005, p 9) state that 'health information alone will not be useful to people who do not feel they have the power to act'. Confidence and self-efficacy to act on the information and to help others is what counts, and this requires additional inputs such as community development and education (Nutbeam 2008; Kickbusch et al 2005; Zarcadoolas et al 2006). The ultimate goal is greater independence and empowerment in individuals and communities to effectively manage their health. For this to happen a greater understanding is needed around the potential of health

education to help focus the health dialogue on the social determinants of health as well (Nutbeam 2008).

Sudore and Schillinger (2009) have developed a framework and description for best practice interventions to improve care for patients with low health literacy in the United States. The framework and description are the result of a comprehensive literature review to identify feasible health literacy interventions at the practitioner-patient level, at the system-patient level and at the community patient level. Although designed to address health literacy in the United States, the framework will provide a useful starting point for analysing and developing effective health literacy interventions in New Zealand.

Key messages from interventions at the health practitioner-patient level include:

- patient-centred communication, where existing patient knowledge and experiences are built on
- clear health communication, including use of plain language
- confirmation of understanding, including use of the teach-back method
- reinforcement of information, including using multiple modalities and using the patient's support network
- clear numeracy and risk information, including providing absolute risks instead of relative risks
- medication reconciliation, including simplifying regimens as much as possible and confirming regimen dosage.

Key messages from interventions at the system-patient level include:

- health education materials, including incorporating the target audience in the design of the tools
- medication drug labels, including using concrete examples
- disease self-management support systems which need to be proactive and disease-specific
- creating an empowering environment, including making signs and forms easy to read and encouraging the patients to use the Ask-Me-3 strategy
- clinician training, including health literacy education while clinicians are in training.

Key messages from interventions at the community-patient level include:

- referrals to adult literacy classes
- use of lay health educators/navigators
- use of mass media to disseminate health information (Sudore & Schillinger 2009).

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Appendix 2. Literature review: Skin infections

Glossary

Broken skin	Any kind of cut, graze or break in the skin that shouldn't be there.
Cellulitis	A common infection where bacteria gets into broken skin or under the skin. The skin becomes swollen and red and broken skin produces pus.
Clinical presentation	The symptoms a patient is experiencing when they first arrive for medical treatment.
Cutaneous abscesses	An infected pus-filled cavity on the skin.
Dermatitis	Inflammation of the skin.
Eczema	A long-term skin disorder with scaly and itchy rashes. Also called Atopic dermatitis.
Epidemiological studies	Studies which look at the patterns, causes and effects of disease in defined populations.
Impetigo	A highly contagious skin infection. Also called school-sores.
Inflammation	Redness and swelling.
Paediatric	The area of medicine dealing with children's health.
Pathology	The study and diagnosis of disease.
Pyoderma	Skin infection.
Scabies	An itchy rash of the skin caused by mites.
Skin abscesses	Warm, painful, pus-filled pockets below the skin surface. Also called boils.
Skin barrier	The skin acts as a natural barrier to bacteria entering the skin and body and causing infection.
Staphylococcus aureus	A bacteria usually found on the skin or in the nose and which is the most common cause of infections.
Streptococcus pyogenes	A bacteria which causes infections.
Superficial acute abscesses	A new (acute) infection on the surface or top level of the skin.

National and international research was reviewed to produce a literature review about skin infections. The main databases we used for this literature review were Google Scholar, PubMed, and BMJ. We systematically checked the reference lists of articles to find further relevant research.

Key terms used were: health literacy and skin infections; skin infections New Zealand; skin infections antibiotics New Zealand; untreated skin infections New Zealand; skin infections treatments New Zealand; skin infections primary care New Zealand; skin infections high risk populations; skin infections risk factors; skin infections literacy; skin infections and diagnosis New Zealand; skin infections health literacy interventions; skin infections self-management; skin infections self-efficacy; skin infections patient-provider communication; health literacy eczema; skin infections children New Zealand; skin infections adults New Zealand; skin infections Māori children New Zealand; skin infections Māori adults New Zealand; skin infections Pacific children New Zealand; skin infections Pacific adults New Zealand; skin infections hospitalisations New Zealand; skin infections hospitalisations; skin infections Māori; skin infections Pacific New Zealand; skin infections cellulitis New Zealand; skin infections impetigo New Zealand; skin infections boils New Zealand; skin infections carbuncles New Zealand; skin infections abscesses New Zealand; eczema New Zealand; eczema Māori New Zealand; eczema Pacific New Zealand; skin infections scabies New Zealand; skin infections community initiatives New Zealand; skin infections minimising risk; skin infections communication tools; skin infections communication strategies.

New Zealand has one of the highest hospitalisation rates for childhood skin infections in the Western World, double the rate of both Australia and the United States (Craig et al 2007). Between 2002 and 2006 3.2 New Zealand children (aged 0-14 years) per 1000 were being hospitalised due to skin infections. For Māori children the rate was 5.4 per 1000 (Craig et al 2007). O'Sullivan et al (2011) found that serious skin infection rates in New Zealand effectively doubled between 1990 and 2007, resulting in over 100 children a week being admitted to New Zealand hospitals in 2007 for the treatment of skin infections, with many children needing intravenous antibiotics and one-third requiring surgery (O'Sullivan et al 2011).

This literature review investigates the prevalence of childhood skin infections in New Zealand, and the knowledge, understandings, and processes related to their treatment. The review focuses on three main types of skin infection: cellulitis, impetigo, and abscesses. Other skin conditions that cause serious skin infections, such as scabies and eczema, are also discussed. All these skin infections may result in hospitalisation or develop into more serious health issues (Ete-Rasch 2009).

Section 1 of this review introduces the skin infection picture in New Zealand with a focus on Māori children. The second section explores explanations for the high rates

of skin infection in New Zealand. The ways in which health literacy can influence the prevalence and severity of these conditions in Māori children is also examined.[3]

Section 1 - The Situation in New Zealand

Infections of the skin and soft tissue are a high priority global issue with developed countries seeing rapidly rising rates of incidence (Regional Public Health 2010), New Zealand being no exception. Anecdotal reports state that New Zealand has a greater problem with serious skin infections than comparable countries such as the United States and Australia (Hunt 2004, p 19; Thompson 2010), especially in terms of cases involving children (University of Otago 2011; O'Sullivan et al 2011).

In an investigation into children's skin infection rates in Tairawhiti, O'Sullivan and Baker (2012) found that over 10 percent of children in the area had consulted their general practitioner (GP) over a skin related issue, with the majority receiving adequate treatment in the primary setting and avoiding hospitalisation. Results show that the highest rates of skin infections were found in Māori children in both the 0-4 and 5-9 year age groups, with the 5-9 year cohort being treated well in primary care, and the 0-4 year age group needing longer hospitalisation. O'Sullivan and Baker (2012) write that their findings are consistent with wider epidemiological studies on New Zealand children's skin infection rates.

The University of Otago (2011) states that as a result of skin infections, an average of 4,450 children aged between 0 and 14 have overnight hospital admissions per annum, with a further 850 children being attended to as day patients. Admission rates are found to be highest among preschool-aged children, Māori and Pacific children, and boys and children living in areas of greatest deprivation (O'Sullivan et al 2011, p 1794). More specific examples include findings from the Glen Innes Serious Skin Infection Prevention Project (Morgan et al 2004) that found that, between 1 July 2002 and 30 June 2003, cellulitis was the most common reason for admission to Auckland's Starship Hospital and the fourth most common reason for admission to Auckland Hospital (Northern Region Health Consortium 2004). Leversha and Aho (2001) note that no other Australasian paediatric hospital ranks cellulitis in the top 20 Diagnostic Related Groups, an idea also explored by Ete-Rasch (2009, p 15). Public Health Nurses in the Glen Innes serious skin infections project estimated that 'approximately sixty percent of their workload is taken up with early intervention and treatment of skin infections' (Hunt 2004, p 9).

For many, this rate of hospitalisation is unacceptable and preventable (University of Otago 2011). As mentioned above, the burden of skin infections lies not only with those individuals and families that are affected, but also within the hospital that must make room for a stay of an average of three to four days (University of Otago 2011). Hospitalisation can be prevented if better home and primary management and care of 'minor cuts, grazes and insect bites' (Ete-Rasch 2009, p 1) is undertaken.

[3] Although the present research focuses with Māori children aged 0-14 years there was a dearth of literature concerning this specific population. This review therefore also includes literature about New Zealand based Pacific children who are also at a high risk of skin infections (Craig et al 2007).

For Baker and Windsor (2009), these hospital admission rates point to a failure in preventive and primary care, noting in their study of admissions to a tertiary hospital that of all 'the patients with superficial acute abscesses admitted under general surgery, 59 percent could have been managed as day cases without requiring hospital admission' (p 43). This understanding is reiterated by a University of Otago stipulation that preventable hospital admission for skin infections fill up 'hospital wards and [reduce] their capacity to treat other surgical conditions. The direct cost to DHBs is around $15 million a year' (University of Otago 2011). Furthermore it appears that a rise in cost per treatment is synonymous with the increase in skin infection based hospitalisation. In Hunt's 2004 report on skin infection prevention in Wellington the average estimated cost of treating a child was $2,180 per case. Five years later Baker and Windsor (2009) found that the average cost of treating a superficial acute abscess in Auckland was $4,440 – a marked increase in five years.

While these figures show New Zealand as having a serious problem with skin infections, several studies have reported that statistics on diagnosed skin infections are only the tip of the iceberg. Official figures reflect hospitalisations and represent only a small fraction of the number of children who receive treatment in primary care, with an estimated 60,000 children per year being treated by GPs for skin infections (University of Otago 2011). Furthermore this does not include the number of children who develop skin infections and do not receive any kind of official medical treatment. Ete-Rasch suggests that 'primary care health services may have a crucial role in minimizing ... avoidable hospitalisations' (2009, p 20), however there is little information pertaining to Māori children's 'clinical presentations ... to primary health care services in New Zealand and the number of skin infections in these presentations' (Ete-Rasch 2009, p 20).

Skin infection rates are affected by seasonal variation. Thompson (2010) states that cellulitis hospital admissions vary by quarter with higher rates being observed in the summer and autumn. She notes that this seasonal variation is also seen in New Zealand 'with highest rates occurring in the warmer summer months' (Thompson 2010, p 33). There may also be an urban/rural divide in the prevalence of skin infections. O'Sullivan et al (2011) reveal that the highest rates for the hospitalisation of Māori and Pacific children were found in urban areas. This is reiterated by the University of Otago who note that 'serious skin infections are more than 1.5 times more common in urban than rural areas' (2011 accessed online).

a) Māori and Pacific

'New Zealand's health outcomes are low in part because gaps have widened between the health status of different groups in our communities over the past three decades. Māori and Pacific children have two or three times poorer health than non-Māori' (Capital & Coast District Health Board 2010, p 8). Consistent with wider observations that Māori and Pacific populations are at a generally higher risk of experiencing infectious diseases (O'Sullivan et al 2011), Māori and Pacific children are found to be more likely to develop serious skin infections (Fawthorpe 2007; O' Sullivan and Baker 2012). A report from the Ministry of Health (2012) identified that

over 10 percent of hospital admissions for Māori children between 2005 and 2009 were on account of skin infections, making hospitalisations of this type the third most common for Māori children. Similarly, Koea and Beban (2010) state that these populations represent a significant proportion of *Staphylococus aureus* and *Streptococus pyogenes* hospitalisations. They cite an Auckland audit of paediatric hospital admissions (Finger et al 2004), stating that 'nearly 42% of children admitted with cellulitis or cutaneous abscesses were Māori, while a further 40% were of Pacific descent' (Koea and Beban 2010, p 467).

In a report on serious infectious diseases in New Zealand, Baker et al (2012) found that between 1989 and 2008 Māori and Pacific (children and adults) hospital admission rates for infectious diseases were close to double those identifying as European or other. They also noted that the percentage increase in admissions was significantly higher for these groups; Pacific at 72.1 percent and Māori at 49.6 percent (compared with European at 40.7 percent) (Baker et al 2012).

In the Reducing Serious Skin Infections Project, analysis of the Hutt Valley District Health Board area found that the rate of admission to hospital with a serious skin infection was two to four times higher for Māori children than other children over the five-year period 2002-2007 (Fawthorpe 2007, p 36). It appears that these admission rates are not attributable to any one geographic location. Another study completed by O'Sullivan and Baker (2012) found that in an epidemiological investigation in Gisborne in 2008, 'over three-quarters of skin infections in primary care occurred in Māori children with an almost identical proportion seen in hospitalised cases' (p 75).

Another investigation, completed by Finger et al (2004) found that at Middlemore Hospital, Auckland, there was a large ethnic discrepancy between Polynesian (Pacific Island and New Zealand Māori) and European children. In their study, 'the incidence of skin infection of the limb in Polynesian children was rated 137.7 per 100,000. In contrast, the incidence in European children was rated 35.4 per 100,000' (Finger et al 2004, accessed online).

b) Other indigenous groups

Literature from abroad has found that in other countries (predominantly Western and developing) indigenous populations suffer from higher proportions of skin infection incidents than their European counterparts (Ete-Rasch 2009). Thompson writes that indigenous populations are at higher risk of skin infections, noting that before studies were completed investigating rates in Australian Aboriginal communities, the highest rates in the world were found 'among New Zealand Māori and Pacific Island children in the 1980s' (Thompson 2010, p 13), although it is not known whether these rates relate to primary care, hospital admissions or both.

In Australia, several studies have found high proportions of indigenous incidences of skin infections in Aboriginal communities and populations. In a five year study of East Arnham communities investigating skin infections in Aboriginal children, Andrews et al (2009) found that of every 100 children in the last year of their study, '25 children of every 100 seen each month' (2009, p 7) were diagnosed with

pyoderma. As part of the same project, McMeniman et al (2011) looked into the rate of skin infection in children between birth and their second birthday. They found 'by 1 year of age 82% of children had presented to the [primary health care] clinic with their first episode of impetigo and 68% with their first episode of scabies' (McMeniman et al 2011, p 270).

Section 2 - Why do skin infections occur?

a) Socio-economic determinants

The most common reasoning for high proportions of skin infections noted by the literature is socio-economic determinants. New Zealand's Child Poverty Action Group highlighted this in their recent review (Turner et al 2011), as did Baker et al (2012) in their review of hospital admissions over a twenty-year period (1989-2008). The New Zealand Child and Youth Epidemiology Service has been measuring the effect of the recent recession on children's health, producing an annual *Children's Social Health Monitor* publication that uses a mix of economic, health and well-being indicators to monitor children's health status and well-being. The first Monitor report released in November 2009 showed a large rise in unemployment 2007–2009 in all groups, but the largest absolute increase was in Pacific and Māori populations (New Zealand Child and Youth Epidemiology Service 2009). Tracking alongside this, as would be expected with increasing economic hardship, have been increases in hospital admissions for conditions that are known to occur more frequently in children who live in poverty (New Zealand Child and Youth Epidemiology Service 2011).

In the Baker et al study (2012), they note that 'the risk of hospital admissions for infectious diseases seemed to be independently associated with ethnicity and socioeconomic status' (p 1116). They also note that while socioeconomic status affects hospital admission rates for all ethnicities, Māori and Pacific peoples appear to be hardest affected (Baker et al 2012).

The University of Otago (2011) found that children living in socio-economically deprived areas were 4.3 times more likely to have a skin infection than those from the least deprived areas. In places of low socio-economic status many factors can be attributed to the development of infections or passing of bacteria between people (University of Otago 2011). In his Wellington review of socio-economic determinants of skin infections Hunt notes that Māori and Pacific populations are generally found in more deprived areas and with 'increasing deprivation there are increasing numbers and rates of hospital admissions for skin infections' (Hunt 2004, p 32). He also notes that skin infections and socio-economic status may correlate at the 'individual and family socio-economic position' (Hunt 2004, p 32). In other words, a low socio-economic status individual or family residing in a higher socio-economic status area may be at a higher risk of skin infections than those around them.

Hunt (2004) suggested that the following socio-economic factors are linked to increased prevalence of skin infections:

- The affordability of hot water.
- The affordability of washing machines and dryers.
- Access to medical care.
- The affordability of first-aid supplies.
- Overcrowded housing.
- Conditions for insects to thrive.
- Poor nutrition and being overweight.

b) Disruption to skin barriers

A second reason for the development of a skin infection may be a disruption of the skin barrier. Hunt (2004) writes that ‘normal, intact skin is an important protective barrier to infection [and] and injury to, or pathology of the skin can open the way to colonisation or contamination by potentially harmful bacteria, and consequently infection and disease’ (p 34). This is reiterated by Best Practice (2010) that notes that broken skin resulting from sports injuries, accidental falls, cuts, burns, stings or bites all contribute to the risk of contracting cellulitis and other skin infections (2010; also see: WellChild 2007).

c) General hygiene

Close contact between people has the ability to spread bacteria causing infections. In light of this it is often mentioned that skin infections may also be the result of poor hygiene in terms of clothing, bedding, schools and personal factors. However it must be noted that while issues such as hand washing are found to be important in maintaining good hygiene, Hunt (2004) states that hygiene practices are most probably not the main predisposing reason for any one person to contract a skin infection, and that in reality, multiple factors are often responsible, for example, poor hygiene and access to health care or low income.

d) Awareness or knowledge about skin infections

A final point about the potential factors inducing skin infections is related to a general lack of knowledge within the populations that suffer the most from them. Best Practice notes that ‘health literacy among Pacific peoples can be variable, and Pacific language translated patient information is not always available. This can lead to delays in treatment and serious complications’ (2010, p 23). These issues surrounding Pacific health literacy may lead to a reduced understanding of standards for basic hygiene and first aid.

To further this, in her investigation of children and skin infections in New Zealand, Ete-Rasch (2009) found that often information about skin infections was felt to be known but was found through alternative avenues such as tradition, parents or community. In her interviews with Pacific parents, Ete-Rasch (2009) found that some mothers ‘used traditional methods and practices they were familiar with on their children before seeking medical help’ (p 87). This includes immersion in sea water, using herbal leaves or applying pressure to the affected area, processes that were used because of beliefs, familiarity and what they have seen work in the past (Ete-

Rasch 2009). At other times in her interviews, mothers expressed that some instances of skin infections were thought to be minor and would clear up on their own. This is known as the ‘wait and see’ approach and has been noted in a number of local and international studies that find that skin infections are often subject to this treatment. Ete-Rasch (2009) writes that this approach is prevalent in Pacific communities and as such Pacific families are often seen as ‘laid back’ in their approach to first aid and medicine. She notes that ‘parents’ perceptions and views of the pre-existing symptoms of skin infection as something minor and harmless are critical as they can determine parents’ initial responses and education regarding this is important’ (Ete-Rasch 2009, p 97).

In other circumstances, parents are often found to consult their local community before accessing the knowledge of medical practitioners. Ete-Rasch found this within her investigation, a result that is consistent with the findings from previous studies on Pacific children (Young 2001) and Māori children (Bolitho and Huntington 2006). However these studies also note that community knowledge is not just traditional and word of mouth, and it must be recognised that data pertaining to first aid and medical practices are also available in community environments. Leversha (personal communication, September 2012) has also found that the main trigger for Pacific parents to seek medical advice is if their child has a fever. By the time fever is present then any skin infection is likely to have progressed to the stage where hospitalisation is necessary.

e) Barriers to education on skin infections

A number of barriers to education concerning children’s’ skin infections have been noted in the literature. Three of these are community engagement, private life, and parental circumstances.

Morgan et al (2004) suggest that there are several reasons why communities do not engage with education about skin infections. The first is that skin infections may not be perceived as a serious issue, becoming such a common occurrence that they have essentially been normalised by populations who experience them as a part of daily life (Morgan et al 2004).

Another barrier cited by Morgan et al (2004) to people seeking skin infection treatment is that people often keep them private. They write of circumstances in which stigma is associated with skin infections, reducing the desire for those suffering to show others or seek medical treatment.

Parental circumstances have also been found to have an association with the management of children’s skin infections. A Nigerian study by Oyedeji et al (2006), when looking into the way that parents might influence the prevalence of skin infections in children, found a correlation between the occurrence of skin infections and parental educational attainment and occupational group – the lower the attainment and group, the more common skin infections were. No New Zealand studies have investigated this relationship.

f) Barriers to accessing health care services for Māori

Poor access to health care services is commonly correlated with the prevalence of skin infections. While little research into Māori and Pacific peoples and access to health care for skin infections has been undertaken, some studies provide evidence that shows Māori and Pacific peoples access primary health care at a lower rate than the general New Zealand population. Ellison-Loschmann and Pearce (2006 p 4) write that

> 'There is increasing evidence that Māoris (sic) and non-Māoris (sic) differ in terms of access to both primary and secondary health care services, that Māoris (sic) are less likely to be referred for surgical care and specialist services, and that, given the disparities in mortality, they receive lower than expected levels of quality hospital care than non-Māoris' (sic).

Furthermore, the National Medical Care Survey, undertaken in 2001 reports on a number of issues facing Māori in their involvement with health care (Jansen and Smith 2006). These issues included: Māori make fewer visits to GPs; GPs and Māori have lower levels of rapport; GPs spend less time with Māori patients; fewer tests are ordered for Māori patients; Māori are provided with fewer follow up consultations; and referrals are less common for Māori patients.

Brabyn and Barnett (2004) suggest that access to adequate health care is often a problem of rural geography. As many Māori live in rural areas they are affected by the issues linked to rural health services such as funding, attracting health practitioners to rural areas, high worker turnover and low care continuity, relative distance to care, and financial barriers.

Other barriers to health care stem from familial or cultural ideals. Jansen and Smith (2006) write that a eurocentric medical system, that promotes self-advocacy and individualism, often puts Māori and Pacific peoples and individuals at a disadvantage. They state that providers need to be able to communicate with their Māori and Pacific patients in a way that they are able to connect with, and if this is not achieved, there is potential for misunderstandings and ineffective health care. While practitioners are often encouraged to learn, and are taught about the cultures of their patients, Jansen and Smith identified that the implementation of this practice is often applied selectively. As Jansen and Smith write, 'when the provider and the patient come from different cultural or racial groups, the patient will receive less discussion, less listening, a lesser standard of care and reduced attention to building and maintaining the relationship' (2006, p 299).

A study by Bolitho and Huntington (2006) reviewing the Māori experience of health care reveals a number of cultural and systemic barriers. Many participants surveyed felt a lack of equality in the patient-provider interactions that they had experienced. Because most parents were employed in daytime jobs, access to GPs was often difficult, leading them to take their children to after-hours emergency care, visiting doctors who were less than familiar with their children's medical history. Furthermore, many participants felt that they were not prioritised at these clinics,

leading to long and exhausting wait times for attention. This created feelings of vulnerability and poor treatment, leading to reluctance to visit clinics, and parents questioning their ability as a parent to decide whether or not their child needs medical attention; a finding also reported in past studies by researchers such as Cram et al (2003).

Literature Review – Skin Infections Reference List

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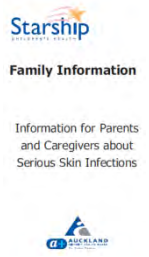
Appendix 3. Hard copy and online resources

Skin Infections Resource List:

Free, downloadable resources from NZ for health practitioners

Resource title and other information
General skin infections
 **Healthy skin in Greater Wellington. A guide to supports and resources that help families to prevent and manage skin infections booklet** Healthy Skin in Greater Wellington, Regional Public Health, Hutt Valley DHB, Capital & Coast DHB, Wairarapa DHB & Ministry of Health, December 2011 www.rph.org.nz/content/7653db00-bf5b-4ba7-bd33-51d4503efbdd.cmr This booklet is intended as a guide to the many resources and services available in the community that may support parents, caregivers and their children to better manage skin conditions and infections. The information in the booklet includes supports and resources from around the Wellington region.

Free, downloadable resources from NZ for patients

Resource title and other information
General skin infections
 **Information for Parents and Caregivers about Serious Skin Infections pamphlet DLE** Also available in Chinese, Māori, Samoan and Tongan Starship Cellulitis Pathway Team / General Paediatrics, developed in conjunction with Auckland Regional Public Health Service, April 2005 And information adapted from “Skin Infections” - MoH resource 1999 www.kidshealth.org.nz/sites/kidshealth/files/pdfs/ENGLISH91466d_CC5217_.pdf

Healthy Skin resources webpage: Collection of a range of available skin health resources

Healthy skin in Greater Wellington resources e.g. sticker, postcard, poster

Cellulitis and Skin Abscesses

General e.g. Adult health skin tool, Infectious diseases card

Headlice

Impetigo

Scabies

Skin Hygiene and Wound Care

Regional Public Health, The Greater Wellington Region

www.rph.org.nz/content/a542bf7f-a172-4caf-a2dd-9f4ca3f6b5ee.html

Healthy Skin poster

Regional Public Health, The Greater Wellington Region

www.rph.org.nz/content/36a741e4-be58-45ad-b3a0-f6bdfc33f58e.cmr

Healthy Skin postcard

Regional Public Health, The Greater Wellington Region

www.rph.org.nz/content/a542bf7f-a172-4caf-a2dd-9f4ca3f6b5ee.html

Healthy Skin sticker

Regional Public Health, The Greater Wellington Region

www.rph.org.nz/content/fb2f7ce5-4400-4ccf-9bad-a374af906ec6.cmr

Healthy Skin colouring-in template

Regional Public Health, The Greater Wellington Region

www.rph.org.nz/content/9c71dcc6-31d9-49c9-abaa-89729c5acb98.cmr

Healthy skin tool handout A4

Regional Public Health, The Greater Wellington Region

www.rph.org.nz/content/48ff8d71-1403-4697-9139-f3f4526f8608.cmr

Washing your hands stickers (for use in bathrooms or restrooms)

Ministry of Health (HE1556)

https://www.healthed.govt.nz/resource/wash-your-handshoroia-%C5%8D-ringaringa

www.rph.org.nz/content/dbaf7f21-1d1e-4358-839a-d963e6dc85c5.cmr

Clean Cut Cover postcard

Available in English and Tongan

Kidz First Children's Hospital, Hā Ora Public Health Promotion

Counties Manukau DHB

Preventing recurrent skin infections leaflet A5

Capital and Coast DHB

www.healthpoint.co.nz/default,169122.sm;jsessionid=1CD66A058B10550C51041E477C8E7075

Eczema Care pamphlet DLE

Capital and Coast DHB

www.rph.org.nz/content/115d02f3-de87-4d12-8563-9feb73bf6609.cmr

Wash your hands and stay well powerpoint (online)

Capital and Coast DHB

www.ccdhb.org.nz/planning/Māori_health/docs/Handhygiene%20English%20FINAL.pdf

Eczema: Information for Parents handout

Kidz First Children's Hospital

Counties Manukau DHB

Clean As poster

Ministry of Health (HE1125)

https://www.healthed.govt.nz/resource/clean

www.rph.org.nz/content/f32b3166-b11d-48e4-a2b2-760228237ec3.cmr

High five for Clean Hands sticker

Also available in Māori

Ministry of Health (HE2203)

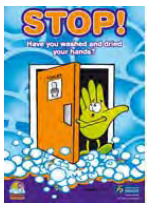
https://www.healthed.govt.nz/resource/high-five-clean-hands-sticker-%E2%80%93-english-version

High Five for Clean Hands poster A2

Also available in Māori

Ministry of Health (HE2201)

https://www.healthed.govt.nz/resource/high-five-clean-hands-%E2%80%93-english-version



Stop! Have you washed and dried your hands? sticker A5

Ministry of Health (HE2202)

https://www.healthed.govt.nz/resource/stop-have-you-washed-and-dried-your-hands

kidshealth.org.nz

Serious Skin Infections web content

Kidshealth - A joint initiative between the Starship Foundation and the Paediatric Society of New Zealand

www.kidshealth.org.nz/serious-skin-infections

Fa' ama'i o le pa'u. Skin infections poster A3 (in Samoan)

Ministry of Health 2001

Skin Infections. Mate Kirikiri poster A3 (in Māori)

Ministry of Health. Date unknown

Health checks at school consent form

To help protect against rheumatic fever and skin infections

Counties Manukau DHB, National Hauora Coalition, July 2012

Scabies

Scabies information sheet and poster

Yellow resource (old) revised June 2006;

Green resource (current) revised May 2011

Ministry of Health (HE4191)

https://www.healthed.govt.nz/resource/scabies

Impetigo

Infectious diseases card A4

Ministry of Health (HE1215)

https://www.healthed.govt.nz/resource/infectious-diseases

Impetigo (school sores) pamphlet DLE

Canterbury DHB

http://www.elmwood.school.nz/newsletters/Impetigo.pdf

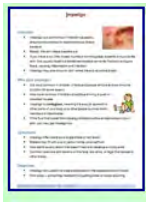
Impetigo pamphlet

Auckland Regional Public Health Service

Available in English, Samoan, Tongan

www.rph.org.nz/content/ff613a75-d1a8-4c3d-ae7e-cf2375ed700c.cmr

http://www1.huttvalleydhb.org.nz/RPH/Resource.aspx?ID=26230



Impetigo handout A5

Health Navigator

www.healthnavigator.org.nz/health-topics/impetigo/

Impetigo web content

DermNet NZ

http://dermnetnz.org/bacterial/impetigo.html

Headlice or Kutu

Headlice Facts pamphlet DLE

Top resource (old) revised April 2001, bottom resource (current) revised May 2006

Ministry of Health (HE4189)

https://www.healthed.govt.nz/resource/headlice-facts

Kutu Headlice poster A3 (in Tongan)

Ministry of Health 2001

Headlice can catch anyone pamphlet A5

Auckland DHB, Counties Manukau DHB, Hā Ora resource Centre, Waitemata DHB

Free, downloadable resources from overseas for patients

Resource title and other information
General skin infections
Infectious conditions practice resources (multiple resources) Health Info Net, Australia www.healthinfonet.ecu.edu.au/infectious-conditions/other-infectious/skin-infections-and-infestations/resources/practice-resources
Healthy Skin program/initiative Health Info Net, Australia www.healthinfonet.ecu.edu.au/key-resources/programs-projects?pid=476
Boils
 **Boils and Skin Infections: information for the public leaflet** Health Protection Agency, UK www.hpa.org.uk/webc/HPAwebFile/HPAweb_C/1287145721614
Impetigo
 **School sores – Impetigo web content** Women and Children's Health Network, Australia www.cyh.com/HealthTopics/HealthTopicDetailsKids.aspx?p=335&np=285&id=2168
 **School Sores (Impetigo) handout** South Australia Health www.dh.sa.gov.au/pehs/ygw/impetigo-pehs-sahealth-2009.pdf
Boils and Impetigo factsheet Available in multiple languages New South Wales Health (NSW Health), Australia www.mhcs.health.nsw.gov.au/publication_details/7100.asp

	Impetigo factsheet Western Australia Department of Health www.public.health.wa.gov.au/cproot/4653/2/impetigo-factsheet.pdf
	**Information for parents on Impetigo brochure** Nova Scotia Health, Canada www.gov.ns.ca/hpp/publications/06012_ImpetigoBrochure_June07_En.pdf
	Impetigo (non-invasive Streptococcus A) factsheet New Brunswick Health, Canada www2.gnb.ca/content/dam/gnb/Departments/h-s/pdf/en/CDC/FactSheets/Impetigo-e.pdf
	Fact Sheet: Impetigo Washtenaw County Public Health, US www.ewashtenaw.org/government/departments/public_health/phcontent/cd_fact_sheets/impetigo.pdf
Cellulitis	
	**Cellulitis factsheet** State Government Victoria, Australia http://health.vic.gov.au/edfactsheets/cellulitis.pdf
	Cellulitis factsheet Capital Health Nova Scotia, Canada www.cdha.nshealth.ca/patientinformation/nshealthnet/0236.pdf
	Cellulitis web content The Royal Children's Hospital Melbourne, Australia www.rch.org.au/kidsinfo/factsheets.cfm?doc_id=11259

MRSA Infections	
	**Educational resources for prevention and control of MRSA and other bacterial skin infections posters** Centers for Disease Control and Prevention (CDC), US www.cdc.gov/mrsa/library/posters.html
	**Information about MRSA skin infections brochure** Centers for Disease Control and Prevention (CDC), US www.cdc.gov/mrsa/mrsa_initiative/skin_infection/PDF/provider/MRSA_ProviderBrochureF.pdf
	**What you need to know about Staph/MRSA skin infections factsheet** County of Los Angeles Public Health, US http://publichealth.lacounty.gov/acd/docs/StaphBrochureENG.pdf
	**Skin Infections factsheet** Washington state Department of Health, US www.co.adams.wa.us/documents/health/MRSA%20skin%20infection-english.pdf

Appendix 4. Health literacy demands

Profile 1. Treating skin infections in children at home

Knowledge

Parents and caregivers must understand:

- what skin infections are and how they can affect their child's health
- what causes skin infections and how they can be spread to other members of the family
- the different types of skin infections and their differences and similarities
- the importance of getting plenty of sleep and eating healthy food and drinks in keeping skin healthy and preventing skin infections
- the importance of thorough hand-washing to prevent the spread of skin infections
- the importance of keeping nails cut short to prevent the spread of skin infections
- the importance of not sharing clothing and bed linen if the family has a skin infection
- the importance of washing clothes, towels and sheets regularly to prevent the spread of skin infections
- the importance of not scratching broken skin or sores because this can lead to skin infections
- that any broken skin (e.g. cuts, scratches, insect bites or grazes) needs to be washed with warm water, dried, and covered with a dressing
- that broken skin needs to be monitored daily
- that skin infections in children can be treated at home with daily washing, covering and checking of the infection
- the signs of a skin infection (e.g. not healing, having pus, being red and swollen, growing in size)
- that if the skin is infected, the child needs to see a doctor or nurse immediately
- that if the child has scabies, they need to see a doctor or nurse immediately as the condition needs specialised insecticide cream
- that if their child has a skin infection the doctor or nurse may prescribe a course of antibiotics
- the importance of taking the full course of antibiotics, even if the skin is better
- that if the skin infection does not get better after the antibiotics, or gets worse while taking antibiotics, they need to take the child back to see the doctor or nurse
- how to measure the dosage (equipment they can use to measure this), and why it is important to give their child the right dosage at the times stated on the label (e.g. three times daily).

Skills

Parents and caregivers need to be able to:

- locate and read printed or online information about the relevant skin condition or infection
- discuss skin condition or infection with child and/or other family members in terms of prevention, washing, not sharing clothing, hand-washing and so on
- compare written or verbal information about a particular skin condition or infection with the child's skin, and make a decision about first aid and other treatment
- use numeracy skills to measure whether or not the infection is growing
- use numeracy skills to give correct dosage of any oral medication prescribed
- manage time to regularly check child's broken skin.

Profile 2. Taking a child with a skin infection to a health practitioner for treatment

This profile builds on the knowledge and skills parents and caregivers need for treating skin infections in children at home.

Knowledge

Parents and caregivers must understand:

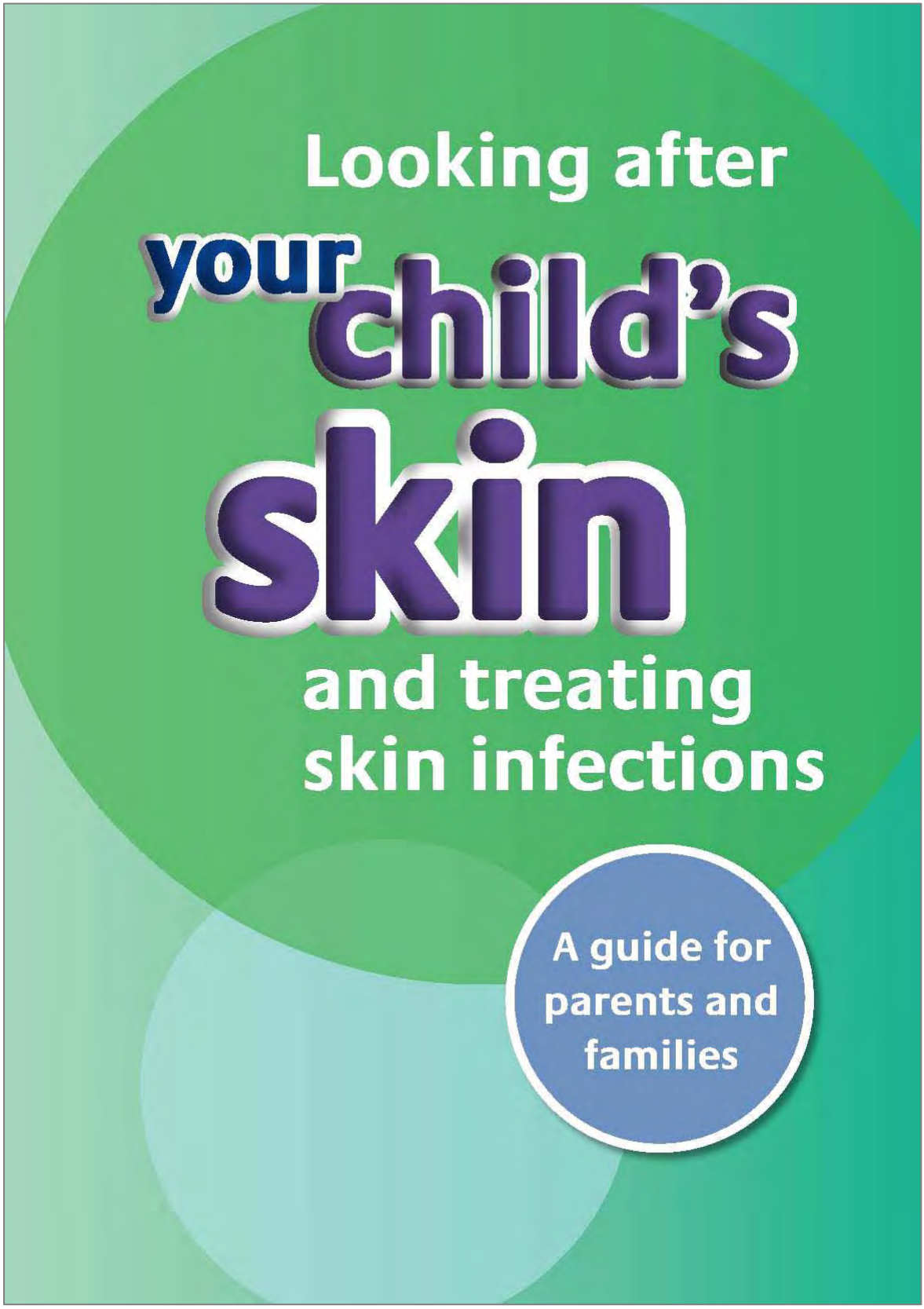
- that the doctor or nurse will ask questions about their child's skin condition or infection, as well as their child's diet, physical activity and/or home environment e.g. Does your home have insulation?
- that if the skin is infected the doctor or nurse will prescribe antibiotics and why
- what antibiotics are and how they help the skin (and body) heal. This may include side effects of taking antibiotics
- that all the antibiotics must be taken, even if the skin infection gets better before all the antibiotics are taken
- that the parents and caregivers can ask the doctor or nurse any questions they have about their child's skin and how they can treat it at home
- that the parents and caregivers can use this opportunity to ask the doctor or nurse any questions they have about the antibiotic treatment, including what to do if the child does not like taking the antibiotics.

Skills

Parents and caregivers need to be able to:

- discuss the child's/family's skin condition or infection with the doctor or nurse
- listen and answer any questions they are asked
- ask questions about their child's skin and treatment
- clarify their understanding of treatment by paraphrasing, summarising, taking notes and so on
- read any printed or online information they are given by the doctor or nurse
- discuss how to take the antibiotic treatment with the doctor, nurse or pharmacist
- read the medication label
- follow the medication instructions
- use numeracy skills to manage the medications (e.g. amount of medication, frequency or treatment)
- use vocabulary skills and strategies to learn new words and concepts e.g. skin infection, condition and medication.

Appendix 5. Booklet for parents, caregivers and children



Healthy Skin

These things help keep your child's skin healthy:

- Eating healthy food like meat, fruit and vegetables
- Drinking plenty of water
- Getting plenty of sleep
- Washing and drying hands after using the toilet and before eating
- Keeping skin clean
- Washing clothes, towels and sheets regularly
- Keeping your child's nails short and clean
- Not scratching skin or sores
- Keeping skin cuts and sores clean and covered
- Treating pets for fleas

Take your child to a doctor or nurse if your child has a sore or wound that:

- Is bigger than the size of a 10 cent coin (about 1.5 cm)
- Is getting bigger
- Has pus
- Has red streaks coming from it
- Is not getting better after two days
- Is close to the eye
- Won't stop bleeding

If skin infections are not treated, they can lead to other serious health problems. Your child may end up in hospital with a serious skin infection or blood poisoning which can hurt their lungs, kidneys, joints, muscles, bones and brain.

Some photographs supplied by the Greater Auckland Integrated Health Network and DermNet NZ.

What causes skin infections?

- Infections are caused by bacteria (germs), viruses and insect poisons.
- There are good and bad bacteria on our skin and in our environment.
- Sometimes your child gets a skin infection, such as a boil, from bad bacteria which is on their skin or in the environment. This small infection can heal or it might get more serious and grow bigger and spread into your child's body and blood.
- Sometimes your child might have a cut, scratch or insect bite. This type of wound may heal if it is cleaned and covered. If the wound gets infected with bad bacteria your child can get an infection like cellulitis (you say sell-u-ly-tis) or impetigo (you say, im-pa-ty-go).

How to clean infected skin

- It is important to clean infected skin because this will help stop an infection growing or spreading to more areas.
- Ask your child to soak in a warm bath or put their infected skin into a bucket of warm water for at least 15 minutes. You can use a small amount of soap to clean around the infected skin.
- If your child has dry or sensitive skin, or eczema, use aqueous cream or soap-free cleansers and shampoos instead of soap.
- Use a soft clean cloth to wipe away any pus or blood from the infected skin.
- Pat the infected skin dry with a clean cloth or towel.
- Cover the infection with a clean dressing, plaster or piece of cloth. If possible, use something that won't stick to the infection. Covering the infected skin helps it to heal, stops bad bacteria from getting into the skin and stops the infection from spreading.
- A child with an infection should not share their bath water, towel or clothes with other people.

Ask your doctor or public health nurse for more ideas for cleaning skin.

Your child should have all infected skin covered if they are going to school, kura or kohanga.

3

Things you could ask your child's doctor or nurse

What type of infection is it?

How do I tell if the infection is getting better or worse?

What sort of medicine is it (pills, liquid, cream) and how do I use it?

Are there any side effects from the medicine?

Who do I call if it gets worse?

How often do I change the plaster or dressing?

How do I clean it?

When can my child go back to school?

When can my child play sport?

How do I stop my child from getting this infection again?

Do I need to treat the rest of the family – or how do I stop them getting this infection?

Your question

Your question

4

Washing and drying hands

1.

Wet your hands under clean running water. Use warm water if available

2.

Put soap on your hands and wash for 20 seconds. Liquid soap is best

3.

Rub hands together until the soap makes bubbles

4.

Rub on both sides of both hands...

5.

and in between fingers and thumbs...

6.

and round and round both hands

7.

Rinse all the soap off under clean running water. Use warm water if available

8.

Dry your hands all over for 20 seconds. Using a paper towel is best (or, if at home, a clean dry towel)

Wash hands for 20 seconds

Dry hands for 20 seconds

Always wash and dry your hands ...

Before

- eating or preparing food

After

- sneezing, coughing or blowing your nose
- playing outside
- touching animals
- going to the toilet

Wash and dry hands before and after touching infected skin

Thanks to Northland District Health Board for this material

Boils

A boil starts as a red lump or pimple with red skin around it. A boil can have white or yellow pus in the centre. It might be itchy or a bit painful. A boil usually starts around a hair follicle (where a hair grows out of the skin).

What to do

- **Go to the doctor immediately if a boil is near the eye.**
- Check and clean boils every day.
- Soak the boil in a warm bath or put a towel soaked in warm water on the boil for 20 minutes.
- If boil bursts, wipe away pus, fluid or blood with clean cotton wool or a cloth soaked in water and antiseptic.
- Wash cloths and towels after each use .
- Make sure your child wears clean clothes every day.
- Wash your hands before and after touching the boil.
- Check the rest of the family for boils.

How are boils spread?

Boils are spread by fluid, blood or pus from a boil touching other skin.

What to do if the boil gets worse

A large, deep boil is called an abscess (you say, ab-ses).

Go to the doctor immediately if the boil is near the eye

Go to the doctor if any of these things happen:

- the boil is bigger than a 10 cent coin
- the boil lasts longer than a week
- the boil is very painful
- red streaks start to appear on the skin around the boil
- there are a lot of boils or your child has boils regularly
- if your child seems unwell or has a fever

A doctor might:

- Drain the pus from a boil
- Give your child antibiotic tablets or a cream to put on the boil

It is important to take the antibiotics each day until they are finished, even if the boil has got better. The antiobiotics need to keep killing the infection in the body after the skin has healed.

Time off from kura or school

If your child is feeling well they can go to kura or school but keep boils covered with plasters or dressings.

Notes:

Cellulitis

(you say, sell-you-ly-tis)

Any area of skin can become infected with cellulitis if the skin is broken, for example from a sore, insect bite, boil, rash, cut , burn or graze. Cellulitis can also infect the flesh under the skin if it is damaged or bruised or if there is poor circulation.

Signs your child has cellulitis:

- The skin will look red, and feel warm and painful to touch
- There may be pus or fluid leaking from the skin.
- The skin may start swelling
- The red area keeps growing. Gently mark the edge of the infected red area with a pen to see if the red area grows bigger
- Red lines may appear in the skin spreading out from the centre of the infection

What to do

- **Cellulitis is a serious infection that needs to be treated with antibiotics.**
- **Go to the doctor if the infected area is painful or bigger than a 10 cent piece.**
- **Go to the doctor immediately if cellulitis near an eye as this can be very serious.**
- Make sure your child takes the anticbiotics every day until they are finished, even if the infection seems to have cleared up. The antibiotics need to keep killing the infection in the body after the skin has healed.
- Check and clean the infected skin every day.
- Wash the infected skin with warm water or in a salt bath. A teaspoon of salt, antiseptic or bleach could be added to a bath to help kill the bacteria.
- Cover with a clean cloth or plaster if fluid or pus is coming out of the infection.
- Keep the infected area raised, for example if the cellulitis is in your child's leg, they should lie down and put a pillow under their leg.
- Give your child paracetamol if they are in pain.

- Wash your hands before and after touching the infected area.
- Keep your child's nails short and clean.
- Don't let your child share bath water, towels, sheets and clothes.
- Make sure your child rests and eats plenty of fruit and vegetables and drinks plenty of water.

Go back to the doctor if the red area gets bigger or deeper or your child has a fever. Cellulitus can spread to other parts of the body or blood. Your child may need blood tests or more antibiotics.

If the doctor gives your child antibiotics, make sure your child takes them every day until they are finished, even if the infection seems to have cleared up earlier. The antibiotics need to keep killing the infection in the body after the skin has healed.

How is cellulitis spread?

Bad bacteria (germs) gets into broken skin such as a cut or insect bite.

Notes:

Time off from kura or school

At least one day after treatment (such as antibiotics) has started, or check with your doctor or public health nurse.

Chicken pox

Children should be immunised to stop them getting chicken pox. Talk to your doctor or public health nurse about immunisation.

A child may have a fever and a headache. Spots will appear with a blister on top of each spot. Blisters pop and get a scab or crust. The blisters are usually on the stomach, back and face, and then spread to other parts of the body. Blisters can also be inside the mouth and on the head.

What to do

- Make sure your child drinks lots of fluid. Water is best.
- Try and stop your child from scratching their skin. You could use calamine lotion or a cool bath to help the chicken box become less itchy.
- Keep your child's nails short and clean.
- Check other children for chicken pox.

How is chickenpox spread?

Coughing and sneezing. Contact with fluid from blisters.

What to do if the chicken pox gets worse

Go to the doctor if any of these things happen:

- spots get redder, warm or painful
- your child gets a fever, cough, diarrhoea (you say, dy-a-ree-a) or starts vomiting. These things can cause dehydration (where your child is getting rid of more fluid than they have from drinking water).

Your child may need blood tests and antibiotics.

It is important for your child to take the antibiotics every day until they are finished, even if the chicken pox seems to have cleared up. The antibiotics need to keep killing the infection in the body after the skin has healed.

Time off from kura or school

One week after the rash starts, or check with your doctor or public health nurse.

Notes:

Cuts, scratches and grazes

What to do

- Clean and check the area every day.
- Wash with warm water.
- Cover with a plaster or bandage – try to use things that won't stick to the cut, scratch or graze.
- Go to the doctor if it is a deep cut or it won't stop bleeding. Your child may need stitches.

How do cuts, scratches and grazes get infected?

Bad bacteria (germs) gets into the wound.

What to do if the cut, scratch or graze gets worse

Go to the doctor if any of these things happen:

- the area around the cut, scratch or graze gets red, swollen or painful
- there is pus
- red lines on the skin spread out from the infected area
- your child feels unwell or has a fever

Your child may have a serious skin infection such as cellulitis. Your child may need blood tests and antibiotics.

It is important for your child to take the antibiotics every day until they are finished, even if the infection seems to have cleared up. The antibiotics need to keep killing the infection in the body after the skin has healed.

Time off from kura or school

If infected, at least one day after treatment has started, or check with your doctor or public health nurse. Cover infected skin with a plaster or bandage.

Notes:

Eczema

(you say, ex-ma)

Eczema is also known as dermatitis (you say der-ma-ty-tis).

Eczema is not an infection. Your child cannot give eczema to another child. Your child cannot get eczema from another child.

Eczema is patches of dry itchy skin that become red. In children eczema is common behind the knees and on arms, hands, neck and face. Sometimes children stop getting eczema when they get older.

What to do

- Keep the skin moisturised to help stop it itching and cracking.
- Moisturise if the skin is dry. This may be many times a day. Use an emollient (you say, e-mole-e-int) cream such as fatty cream or non-ionic cream. Your doctor can prescribe these creams. Use creams without perfume as perfumes can make the skin sting and itch. Make sure your hands are clean before applying eczema creams. Do not put your hands in tubs of creams as this can spread germs. Spoon out what you need and put this on a dish or paper towel.
- Keep the skin clean.
- Use soap-free cleaners (such as non-ionic cream) instead of soap.
- Keep your child's nails short and clean.
- If your child has eczema and swims in the sea or a pool, when they finish swimming wash off the salt water or chlorinated water, as the salt and chlorine can dry out their skin.

Do not do anything to dry out the skin as this will make the eczema worse.
Eczema can be controlled with treatment.

See your doctor if your child is waking at night or missing school because of their eczema.

What to do if eczema gets infected

These are pictures of infected eczema.

Go to the doctor is any of these things happen:

- areas of skin start swelling and become more painful
- pus develops
- the infected eczema is bigger than a 10 cent coin
- small red spots appear around eczema

Your child may need special cream, such as steroid cream, blood tests and antibiotics, if their eczema gets infected.

It is important for your child to take the antibiotics every day until they are finished, even if the infected eczema seems to have cleared up. The antibiotics need to keep killing the infection in the body after the skin has healed.

How do you get eczema?

The exact cause of eczema is unknown.

Eczema is not contagious.

Time off from kura or school

If your child feels well they can go to kura or school

Notes:

15

Impetigo

(you say, im-pa-ty-go), also known as school sores

Blisters on exposed parts of body, such as hands, legs and face. Blisters burst and turn into a sore with a yellow crust that gets bigger each day.
The sores are itchy.
The sores spread easily to other parts of the skin.
Impetigo is easily spread to other children and adults if they touch the sores.

What to do

- Go to the doctor.
- Check and clean every day.
- Gently wash the sores with warm water and a soft cloth. Wash the sores until the crust comes off and wash away the pus and blood.
- Check other children for impetigo. Use any cream from the doctor on the sores.
- Cover sores with a cloth or plaster to help stop the infection from spreading.
- Keep your child's nails short and clean.
- Wash your hands before and after touching the skin or sores.
- Make sure your child washes their hands often, especially if they touch the sores.

How are school sores spread?

Fluid or pus from sores gets on other skin. Keep sores clean and covered.

What to do if impetigo gets worse

You need to go back to the doctor if any of these things happen:

- sores last more than a week
- sores become red or swollen
- sores have pus in them
- your child has a fever

The infection may have spread to other parts of the body or blood. Your child may need blood tests and antibiotics.

It is important to take the antibiotics every day until they are finished, even if the impetigo seems to have cleared up earlier. The antibiotics need to keep killing the infection in the body after the skin has healed.

Notes:

Time off from kura or school

One day after treatment has started, or check with your doctor or public health nurse or school.

Insect bites

An insect bite is usually a red itchy bump.

There may be a blister in the middle.

Sometimes insect bites are painful (especially spider bites) as well as itchy.

What to do

- Check and clean every day.
- Wash the bite with cool water.
- Keep your child's nails short and clean.
- Do things to stop the itching like soaking in a cool bath, or putting calamine lotion or aloe vera on the bites.
- Treat pets for fleas.
- Put mosquito nets around beds, put insect screens on windows and close windows at night.
- Wear close-fitting cotton sleeves or pyjamas.
- Use children's insect repellent.
- Go to the doctor if the insect bite is near the eye.

What to do if it gets worse

Go to the doctor if any of these things happen:

- the bites last more than 2 weeks
- the red, swollen area keeps getting bigger or more painful
- there is pus in the bite

This could be a serious skin infection such as cellulitis.

How do you get insect bites?

Bites from insects such as mosquitos, fleas or spiders.

Time off from kura or school

If your child feels well they can go to kura or school.

Notes:

Ringworm

Flat, ring-shaped infection.

Ringworm on the scalp can cause round, painful red patches and make hair fall out.

What to do

- Check and clean skin everyday.
- See your doctor if the ringworm is on your child's scalp as this needs to be treated with medicine.
- For ringworm on other parts of the body a public health nurse, pharmacist or doctor can show you which cream to use to kill the infection.
- Go to the doctor if your child has a fever OR their skin becomes swollen, warm or leaking fluid.
- Check other children for ringworm.
- Treat any animals or pets with ringworm.

How is ringworm spread?

Contact with infected skin, clothes, personal items or surfaces.

What to do if ringworm gets worse

Go to the doctor if any of these things happen:

- the infection lasts more than 2 weeks
- the ringworm is on the scalp
- skin becomes red and swollen
- there is some pus in the infection
- your child has a fever

Notes:

Time off from kura or school

Stop your child from doing things where their skin touches other children's skin such as wrestling and swimming, until the ringworm goes away.

Scabies

(you say, skay-bees)

Scabies is caused by a tiny insect known as a mite which digs under the skin and lays eggs. Small blisters grow on the skin above each egg and the skin gets very itchy. The redness and small blisters look like a rash on the skin.

The scabies rash may start anywhere but it is usually between fingers, on wrists, inside the elbow, around the waist, on the bottom or private parts and under armpits.

What to do

- Go to a doctor or call the school nurse or public health nurse to get an insecticide (you say, insect-a-side) cream to kill the mites. If your child is under 2 years old, they may need a different treatment so make sure you check with your doctor or nurse.
- Get enough cream to treat everyone in the household. Everyone should be treated even if they don't have a rash or itch.
- Apply cream to everyone in the family or household on the same day.
- The cream has to go all over the body, from head to toe - including the soles of feet.
- The cream must be left on overnight.
- On the same day as putting the cream on everyone you also need to wash all sheets, pillow cases, towels and clothes in hot water – or you need to put these things into a sealed plastic bag for 5 days to kill the mites. If you don't do these things, the mites will reinfect your family.
- Hang quilts and blankets outside for a day so the sun can kill any mites.
- Check other family members for scabies.

What to do if scabies get worse

- Once you have killed the scabies mites with the cream, the sores or the rash will stop growing but it will still be itchy for up to four weeks.
- The sores and rash can become infected.
- Go to the doctor if the sores or rash gets redder, warm, start swelling or have pus. This could be cellulitis.

You may also need to repeat the treatment of the whole family with the insecticide cream.

If your child's scabies has turned to cellulitis, your child may need blood tests and antibiotics.

It is important to take the antibiotics every day until they are finished, even if the scabies has cleared up earlier. The antibiotics need to keep killing the infection in the body after the skin has healed.

How is scabies spread?

Skin contact with the infected person, and sharing sheets and clothes.

Notes:

Time off from kura or school

At least one day after treatment with the insecticide cream.

Check skin infections

Wash your hands before and after touching infected skin

MINISTRY OF HEALTH
MANATŪ HAUORA

Workbase
Leading health literacy

This booklet was developed by Workbase Education Trust as part of a research project funded by the Ministry of Health.

Appendix 6. Poster for parents, caregivers and children

Skin problems in children

Problem	Early signs	What to do	If it gets worse	How is it spread?	Time off from school or kura
Boils	 Red bump or pimple with red skin around it. Can have white or yellow pus in the centre Might be itchy or a bit painful A large boil is called an abscess (you say, ab-ses)	Go to the doctor immediately if a boil is near your child's eye Check and clean boils every day Soak the boil in warm water for 20 minutes or cover with a towel soaked in warm water If boil bursts, wipe away pus and blood with a tissue Wash and dry hands before and after touching the boil	 **Go to the doctor if any of these things happen:** • the boil gets larger or more painful • more boils appear • the boil lasts more than one week • red streaks start to appear on the skin around the boil • your child gets boils often • your child seems unwell or has a fever	Pus or blood from a boil getting on to the skin can cause more boils	While your child is feeling unwell If your child is feeling well they can go to school or kura but keep boils covered with plasters or dressings
Cellulitis (you say, sell-you-ly-tis)	 Skin will look red and feel warm and painful to touch There may be pus or fluid leaking from the skin Any broken or bruised skin can get infected with cellulitis	Go to the doctor if the cellulitis is painful, bigger than a 10 cent piece or near the eye Check and clean every day Wash the red skin with warm water, or soak in a bath Cover with a clean cloth or plaster if leaking Give your child paracetamol if they are in pain Wash and dry hands before and after touching the infected area Keep your child's nails short and clean Make sure your child rests and eats plenty of fruit and vegetables	 **Go back to the doctor if any of these things happen:** • infected area gets larger or deeper • your child seems more unwell or has a fever **This is urgent, the infection may travel to your child's blood. Your child may need blood tests and antibiotics**	Pus, blood or other fluid from the infection gets on to broken skin	For at least 1 day after treatment has started. Or ask your doctor or public health nurse
Cuts, scratches and grazes	 Broken skin with some blood	Clean and check the broken skin daily Wash with warm water Cover with a plaster or bandage. Try to use things that won't stick to the wound Go to the doctor if it is a deep cut or it won't stop bleeding. Your child may need stitches	 **Go to the doctor if any of these things happen:** • the cut, scratch or graze is near the eye • the broken skin gets more red, swollen or painful • there is pus around the broken skin • red lines spread out from the broken skin • your child feels unwell or has a fever **This may be cellulitis, the infection may travel to your child's blood. Your child may need blood tests and antibiotics**	Pus, blood or other fluid from the infection gets on to broken skin	If infected, at least 1 day after treatment has started. Or ask your doctor or public health nurse
Eczema (you say, ex-ma) Also called Dermatitis (you say, der-ma-ty-tis)	 Dry itchy skin Skin becomes red Often in moist areas like behind the knees	Keep the eczema clean Use soap-free cleaners instead of soap Moisturise if the skin is dry. This may be many times a day. Use an emollient cream such as fatty cream or non-ionic cream Keep your child's nails short and clean. Try to stop them scratching the eczema See a doctor for medicated creams if your child is waking at night or missing school because of eczema	 **Go to the doctor if any of these things happen:** • areas of skin start swelling and become more painful • there is pus in the eczema This means the eczema has become infected. It could be cellulitis **Do not do anything to dry out the skin as this will make the eczema worse**	Eczema is not contagious	If your child feels well they can go to school or kura
Impetigo (you say, im-pa-ty-go) Also called school sores	 Blisters on exposed parts of body, such as hands, legs and face. Blisters burst and turn into a sore with a yellow crust which gets bigger each day The sores are itchy	Go to the doctor for antibiotic tablets or a cream Check and wash sores every day Use the cream as told by your doctor or nurse Cover sores with a clean cloth or plaster Keep your child's nails short and clean. Try to stop them scratching the sores Wash and dry hands before and after touching the sores	 **Go to the doctor if any of these things happen:** • sores are near the eye • sores last more than 1-2 weeks • sores become red, swollen and have pus • your child has a fever **This is urgent, the infection may travel to your child's blood. Your child may need blood tests and antibiotics**	Pus, blood or other fluid from the sores touching other skin	For at least 1 day after treatment has started. Ask your doctor or public health nurse
Insect bites	 Red bump There may be a blister in the middle Very itchy Sometimes painful (especially spider bites)	Check and clean bites every day Wash the bite with cool water Stop scratching Keep your child's nails short and clean Try to stop them scratching the bites Use something to stop the itching such as ice, calamine lotion or aloe vera	 **Go to the doctor if any of these things happen:** • the bumps last more than 2 weeks • the red, swollen area keeps getting bigger or more painful • there is pus The swelling could be poison from the insect or a serious skin infection such as cellulitis	Insects such as mosquitos, fleas or spiders	If your child feels well they can go to school or kura
Ring worm	 Flat, ring shaped infection	Go to the doctor if your child has a fever or their skin: • gets swollen • gets warm • starts leaking fluid See your doctor if the ringworm is on your child's scalp. This may cause painful red patches and hair loss Your doctor, public health nurse or pharmacist can suggest a cream to use to kill the infection Check and clean skin every day	 **Go to the doctor if any of these things happen:** • the ringworm is on the scalp • infected area lasts more than 2 weeks • skin becomes red, swollen and has pus • your child has a fever This is a serious skin infection	Ringworm spreads easily through contact with infected skin, clothes or personal items. Also from floors and showers	Until the infection is gone don't let your child do things where their skin could touch other children
Scabies (you say, skay-bees)	 Itchy rash in places such as: • the forearm • around waist • between fingers • between buttocks • under armpits	Go to the doctor or public health nurse to get cream for everyone in the house Scabies is very contagious so everyone in the house needs to be treated even if you can't see any rash Apply cream to everyone, head to toe - including soles of feet. Don't put cream on or near eyes Wash all sheets, towels and clothing in hot water	 **Go to the doctor if any of these things happen:** • rash becomes infected • the skin is red, painful, warm, swollen or has pus This is a serious skin infection. Remember, everyone in the house must be treated for scabies	Skin contact with a person with scabies. Sharing sheets, towels and clothes	For at least 1 day after treatment has started

Check skin infections every day

Your child's skin may not look exactly like these pictures. Ask your public health nurse, school nurse or doctor what is wrong with your child's skin if you are not sure.

Remember, wash hands before and after checking skin problems!

MINISTRY OF HEALTH MANATŪ HAUORA

Workbase Leveling Health Literacy

This poster was developed by Workbase Education Trust as part of a research project funded by the Ministry of Health.

Some photographs supplied by the Greater Auckland Integrated Health Network and DermNet NZ.

Appendix 7. Talking Points (scripts)

Talking Points for the booklet

Looking after your child's skin and treating skin infections

Purpose

This booklet contains some general information about first aid for skin infections and hand washing as well as specific information about different types of skin problems and infections.

Each section contains first aid information as well as signs showing when a child needs to go to the doctor.

This booklet is designed to be used by health practitioners with parents and caregivers to acknowledge their existing knowledge and skills, build new knowledge and review first aid and hand washing activities.

Scenario 1. Talking to a parent or caregiver about a specific skin problem (first visit with the booklet)

1. Acknowledge that the parent or caregiver have asked you to visit because one of their children has a problem with their skin. Acknowledge that it is great they have recognised that their child has a skin problem and asked for help.

2. Show the parent or caregiver the booklet and explain the purpose of the booklet is to give family information about different skin problems and infections and how to treat them. The pictures are to help family recognise the different skin infections.

3. Explain to the parent or caregiver that the booklet is arranged in sections. Pages 2 and 3 give information and instructions on how to prevent skin infections and what to do if you get a skin infection. Pages 4 and 5 have picture-based instructions on how to prepare for a visit to the doctor and wash hands properly.

4. Explain that from page 6 onwards there is information and advice about specific skin problems. Show them that the first page has pictures and information about a skin problem and the second page has pictures and information about what to do if it gets worse. Use the information on the page relevant to the parent/child as an example (or use boils on pages 6 and 7 as an example). Pronounce any unfamiliar terms carefully and point to the word on the page.

5. Ask the parent or caregiver what it is that is worrying them about the child's skin. If the child is there ask to see what the skin looks like. Ask the parent, caregiver or child how long the child has had the skin condition.

6. Ask them what skin problem their child has. If they don't know, use the booklet to show them pictures of the condition and compare these to the child's skin.

Reinforce what the skin condition is, using the description. For example, if the child has boils, refer to page 6 and go through the description.

7. Use the photos in the booklet to work out whether the child requires medical attention or if the condition can be treated at home. If, for example, the child has an infected boil, use the information on page 7 to show how the boil may now have become an abscess.

8. If the child's skin doesn't require medical attention, ask the parent or caregiver what they are currently doing to treat the skin condition. Ask them if they have treated this type of infection before and what they remember doing. Acknowledge what they are doing and make additional suggestions if relevant.

9. Use the booklet to reinforce the things they are doing and add any actions. For example, if the child has boils, refer to the information at the bottom of page 6.

10. If the child is not present, then ask them to describe to you what the skin condition looks like. Go through the booklet with the parent or caregiver until you find the right photo.

11. Talk about cleaning the skin. Use the shower, bath or basin to demonstrate this or get the parent or caregiver to show what they do. Check what first aid supplies the family has. Add any additional information where relevant.

12. If relevant (in terms of skin conditions), talk about how household bleach that is already used in the home could be added to water (e.g. Janola) and discuss or demonstrate quantities.

13. If relevant, use the information in the booklet to show that the child now needs to see a doctor or nurse. Refer to the information in the booklet that the doctor or nurse will probably give the child a prescription for antibiotics or cream. Ask the parent or caregiver what they know about taking antibiotics. Acknowledge what they know and add any relevant information so that the parent or caregiver is aware of the importance of taking all of the antibiotics, even if the skin looks better.

14. Help the parent or caregiver prepare for the doctor or nurse by discussing questions the parent or caregiver are likely to be asked. Look at page 4 of the booklet to see if they have any of these questions. Ask the parent or caregiver what other questions they have for the doctor or nurse and, if they would like it, write these down. Make sure there is a question about how long any antibiotics will need to be taken for.

15. Tell the parent or caregiver that the doctor or nurse will talk to them about how they need to wash the skin every day and change the dressing. Go through the information at the bottom of page 3 in the booklet and reinforce with the diagram on the back page of the booklet.

16. Demonstrate to the parent or caregiver how to cover the infection and talk about the types of covering and dressings they could use.

17. Ask the parent or caregiver what they know about preventing skin infections coming back and preventing the infection spreading to members of the family. Acknowledge any measures they are taking and refer to the information at the top of page 2 and on page 5 in the booklet. Emphasise the importance of hand washing and drying for the child and also for the parent if they are giving the child first aid.

18. If relevant, discuss the child taking time off from kura or kōhanga while they are infectious. For example, if the child has boils, refer to the information at the bottom of page 7 in the booklet.

19. Write down any additional instructions on the relevant page in the booklet and leave it with the parent or caregiver to refer to.

Talking Points for the booklet

Looking after your child's skin and treating skin infections

This booklet is designed to be used by health practitioners with parents or caregivers to acknowledge their existing knowledge and skills, build new knowledge and review first aid and hand washing activities.

Scenario 2. Follow up after medical attention. Second or subsequent visits

1. Acknowledge that the parent or caregiver has done the right thing in taking the child to see a doctor or nurse about their skin condition. Explain that this is just a follow up visit to see how they are getting on with the treatment and to answer any questions they have.
2. Ask the parent or caregiver to get their booklet out and find the part which has information about the relevant skin problem. Use this as an opportunity to revisit and reinforce vocabulary e.g. abscess (you say ab-ses). Ask them if they used the booklet in their decision and ask them what made them decide to take the child to the doctor.
3. Ask the parent or caregiver how the doctor or nurse's appointment went, what advice and medicine they were given, and if they have any questions.
4. Ask the parent or caregiver if they think the child's skin is getting better since they have been taking medicine. Ask them to describe how the child's skin has changed and use the pictures in the booklet to help with this. If possible, check the child's skin.
5. Ask to look at the medicine and talk about how the child has been taking it to confirm that the child has been taking it as prescribed. Ask if the child had any problems with the medicine and acknowledge the good job the parent or caregiver has been doing to get the child to take the medicine. Discuss why it is important to take medicine until it is finished, even once skin has healed.
6. Ask the parent or caregiver what the doctor or nurse said about how they should be treating the child's skin at home. Reinforce this by going to the appropriate page in the booklet and going through the 'what to do' information. For example, if the child has boils, go through the information at the bottom of page 6.
7. If you think the skin isn't looking better or if the parent or caregiver doesn't think the skin is improving then refer to the appropriate page in the booklet and discuss what they should do if the skin problem gets worse.
8. If the infection is healing, talk to the parent or caregiver about preventing skin infections from coming back. Ask them what they are currently doing to prevent re-infection and to prevent the infection spreading to other members of the family. Acknowledge any measures they are taking and suggest other actions they could take – referring to the booklet where possible.
9. If relevant, refer to the general information at the top of page 2 and the specific instructions on hand washing on page 5. This is important for the parent or caregiver as well, as they are changing dressings.

10. Ask the parent or caregiver about materials they have available for dressing the skin and discuss the frequency of changing the dressing.

Talking Points for the poster

Skin problems in children

This poster is designed to be used by health practitioners with children at schools, kura or kōhanga to build knowledge about a range of skin problems and skin infections and what to do to help treat these problems. The poster can also be used with parents and caregtivers to build knowledge.

Scenario 3. Keeping skin healthy and preventing skin infections

1. Ask children what they do to keep their skin healthy and why they do that. Explain or reinforce the importance of eating good food and getting plenty of sleep, proper hand washing, keeping nails short, cleaning, covering and checking skin problems daily.
2. Ask children if they know why children get skin problems or infections so often. Discuss the causes of skin infections such as the sorts of injuries children get from playing, insect bites, catching infections from each other. Talk about infections sometimes caused by germs getting into broken or open skin (like a scratch or insect bite). If eczema is discussed, emphasise that eczema is not infectious, but sometimes eczema can become infected like other broken skin.
3. Explain that the poster is made up of rows. Each row has important information about each skin problem – show that the rows are different colours to help separate one row from the next. Ask if any of the children would like to read out the headings across the top row (Problem, Early signs, etc). Pick a skin problem of interest to the children and work through the information in the row – referring back to the headings in the top row as you go (e.g. The “Early signs” of a boil look like this photo...). This helps children understand the layout of the poster using the headings, and think about the purpose of the information.
4. Children could practice saying the new words (like cellulitis). Show the children how to spell and pronounce the word by writing it correctly and phonetically on any whiteboard, etc. For example, show that for cellulitis you say sel-u-ly-tis.
5. Ask the children what they usually do when they first notice a skin problem. Reinforce good actions and suggest others as relevant. Discuss who they need to talk to about a skin problem and why.
6. Talk about telling an adult immediately if their skin won’t stop bleeding or the problem is near the eye.
7. Refer to the third column in the poster which explains what needs to be done for that skin problem. Reinforce the importance of cleaning and covering the area every day and proper hand washing and drying.
8. Talk about the signs that the skin has become infected or got worse (pus, red around the edges, growing, swollen, painful). Talk about going to the doctor or school nurse if the skin is infected. Talk about an infection getting bigger than a 10 cent piece. Show the children a 10 cent piece. Discuss how small it is. Hold up

a 10 cent piece against the skin so they can see what size area you are talking about.

9. Look at the last two columns of the poster. Ask the children if they know how skin problems are spread (a review of some of the causes of skin problems discussed in question 2). Use the poster to explain how an infection is spread and the general guide for time off from school or kura.
10. Invite the children to have a closer look at the poster. Ask them how they could use the information in the poster.
11. Ask them where in the school would be a good place for the poster to be put on the wall.

Appendix 8. Lesson plans

The following Lesson Plans have been developed for Years 2 and 3 (Ages 6 and 7)

Years 2 and 3 . Looking after your skin lesson plans	
Lesson Plans	**Handouts**
Part 1 - Germs and our skin	Germs (bacteria) – jpeg image file
Part 2 - Washing your hands kills germs	Handwashing pictures Instructions for washing hands
Part 3 - Scratches, bites, cuts and grazes	Pictures of broken skin
Part 4 - Skin infections	Poster of cross section of skin Simple definitions for skin infections Colour photos of skin infections: boil cellulitis impetigo scabies

Looking after your skin lesson plan: part 1
Germs and our skin!

Years 2 and 3 (ages 6 & 7)

Lesson length: 50 – 60 minutes approx

Learning outcomes

By the end of this lesson pupils will be able to:

- Understand what germs are and how they can affect our bodies
- Understand how germs can spread
- Understand that the skin is an organ which protects us from germs

Resources needed:

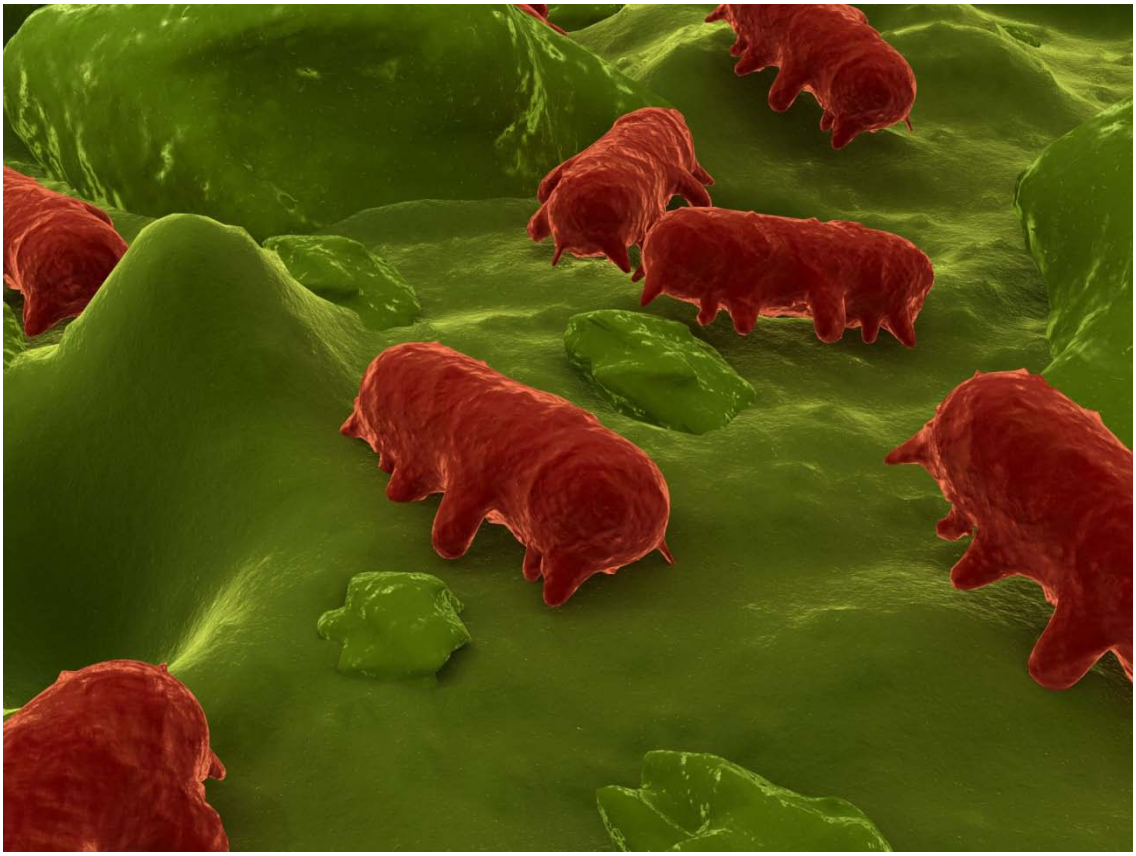
- Poster of germs
- Glitter, bowl, water
- *Additional: Computer and projector for video clip*
- *Internet access for http://www.brainpop.com/health/bodysystems/skin*

Lesson plan outline

Time	Activity	Resource
3 mins	Show pupils still of germs and ask them what they think this is. Tell them it's something that is very small (we can't see it/them), all around us but that can also make us sick if it gets into our bodies. Try to get the word 'germ(s)' and write up on the board.	Poster of germs
10-15 mins	Spend some time talking about germs. For example could have a conversation around the following: **What are germs?** Tiny, invisible living creatures that are everywhere. Need a microscope to see them. If too many get inside our bodies they can make us really sick and we might need to go to the doctor. **Good and bad germs.** Some germs (bacteria) that live in our stomachs are good bacteria and help us break down (digest) the food we eat. **Where do germs live?** Germs live everywhere and especially like damp and dirty places. Some of their favourite places are dirty floors, toilets, money, rubbish bins and animals.	

15 mins	Tell pupils that germs can spread quickly and easily. They spread through coughing, sneezing and sharing drinks. They also spread through **touch**. Demonstrate this way through the glitter activity. Get one volunteer to wet their hands and dip them in the glitter bowl so that the glitter sticks all over their hands. Explain to the class that in this activity the glitter is 'germs'. The volunteer shakes hands with 3 other pupils who in turn shake hands with 3 more pupils until all hands have been shaken. Get the pupils to look at their hands and see how much glitter or germs are on them. Tell students that this shows how germs can travel by touch. *Alternative activity: fill a balloon with glitter, hold it up high and then pop it. The glitter should spread around the room which shows how easily germs can spread through the air.*	Glitter, bowl, water
10 mins	Ask pupils to name some organs they have. Write them up on the whiteboard e.g. heart, brain, stomach lungs etc (pupils might need a bit of prompting with this as they might not know what an organ is). Ask pupils what is the largest organ in the body? Answer: skin. This could be done as a riddle, e.g. **What am I?** • Everyone has me • I am all over the body • I am soft • I can be dark or pale • I have hairs growing out of me • I have lots of tiny holes on my surface • I lose about 30,000 to 40,000 dead cells from my surface every minute even though you can't see it	Whiteboard
10 mins	Once pupils have guessed skin ask them what they think the skin does? Get their ideas and if necessary explain that it protects our organs and keeps germs out etc. You could show the first few seconds of the video clip from *http://www.brainpop.com/health/bodysystems/skin* and get these answers from the pupils.	*Computer/internet connection and projector*

Part 1 Handout: Germs (bacteria) – jpeg image file



Looking after your skin lesson plan: part 2
Washing your hands kills germs!

Years 2 and 3 (ages 6 & 7)

Lesson length: 50 minutes approx

Learning outcomes

By the end of this lesson pupils will be able to:

- Understand the importance of proper hand washing in preventing the spread of germs
- Identify and order key stages in the hand washing process
- Practise washing hands

Resources needed:

- Hand washing pictures (need to be cut up). May need several sets of pictures.
- Set of instructions (need to be cut up)

Lesson plan outline

Time	Activity	Resource
5-10 mins	Start by asking pupils to tell you what they learnt in the last lesson e.g. - Germs are invisible and everywhere - There are good and bad germs (bacteria) - Germs spread easily and by touch - Our skin is what protects us from bad germs Explain to pupils that one of the best things we can do to stop germs spreading is to wash our hands.	Whiteboard
15 mins	Ask pupils when they wash their hands and write up their answers on the board. Could divide into before and after and both before and after e.g. before eating or touching food, after going to the bathroom, and before and after visiting someone in the hospital.	Whiteboard
20 mins	Put pupils in pairs or groups of 3. Give each pair or group a set of hand washing pictures and ask them to describe what they can see in each picture. Could do this as a whole class. Then get pupils to put the pictures in the order they think is correct. Talk with them about what is happening in each picture. Get pupils to match the pictures with the instructions. If	Hand washing pictures and instructions

	they are not able to do this, then read the instructions aloud and match them up as a whole class. Explain that they need to spend around 20 seconds washing their hands and around 20 seconds drying them. Tell pupils that 20 seconds is roughly the same time it takes to sing happy birthday twice.	
5 mins	Pupils practise washing their hands in pairs and timing each other.	

Part 2 Handout: Handwashing pictures

Part 2 Handout: Instructions for washing hands

Wet you hands under running water. Warm water is best.
Put soap on your hands. Liquid soap is best.
Rub hands together until the soap makes bubbles.
Rub both sides of both hands.
Rub in between fingers and thumbs.
Rub around the palm of each hand.
Rinse all the soap off under clean running water. Warm water is best.
Dry your hands for 20 seconds. If you are home use a clean, dry towel. If you are out use a paper towel.

Looking after your skin lesson plan: part 3
Scratches, bites, cuts and grazes!

Years 2 and 3 (ages 6 & 7)

Lesson length: 50 minutes approx

Learning outcomes

By the end of this lesson pupils will be able to:

- Identify some common examples of broken skin
- Understand key messages about how to care for broken skin

Resources needed:

- Pictures of broken skin
- Poster making materials

Lesson plan outline

Time	Activity	Resource
5 mins	Get pupils to tell you what they learnt in the last lesson. • Washing hands is one of the best ways to stop the spread of germs • Wash hands thoroughly and regularly (20 seconds washing and 20 seconds drying)	Whiteboard
10-15 mins	Tell pupils that even though we might wash our skin really well, germs can still sometimes get in. Show the class colour photos of broken skin and ask them what they can see in each one. E.g. this person has a **cut**, this person has a **scratch**, this person has a **graze**, this person has an **insect bite**. Write the words up on the whiteboard and get the pupils to write them next to each picture.	Pictures of broken skin
5 mins	Pupils can show each other any examples of cuts, scratches, bites and grazes they have and explain how they got them.	
10 mins	Tell pupils that when germs get into our bodies through cuts, scratches, bites and grazes they can sometimes make us sick. Tell pupils that they should do three things when they	Whiteboard

	get a scratch, cut, graze or insect bite. 1. **Show** your parents and **tell** them how you got it. 2. Get your parents to **help** you **wash** the cut, scratch or graze with warm water, **dry** it with a clean towel, and **put** on a plaster. This will keep the germs out. 3. With your parents, **check it** every day to see if it's getting better. If it's not better after a few days you should go to the doctor or pharmacist. Tell pupils that it's also important that they keep their nails cut short and neat because germs can hide under long fingernails. Get pupils to show each other their nails and see if they can see any germs underneath. Which ones need a cut?	
5 mins	If there is some time left pupils can make a poster outlining what they should do if they get a cut, scratch, bite or graze. Pupils can finish for homework.	Poster making materials

Part 3 Handout: Pictures of broken skin

Looking after your skin lesson plan: part 4
Skin infections!

Years 2 and 3 (ages 6 & 7)

Lesson length: 50 – 60 minutes approx

Learning outcomes

By the end of this lesson pupils will be able to:

- Understand what causes skin infections
- Identify some common examples of skin infections and/or describe what they look like
- Convey key messages about skin hygiene

Resources needed:

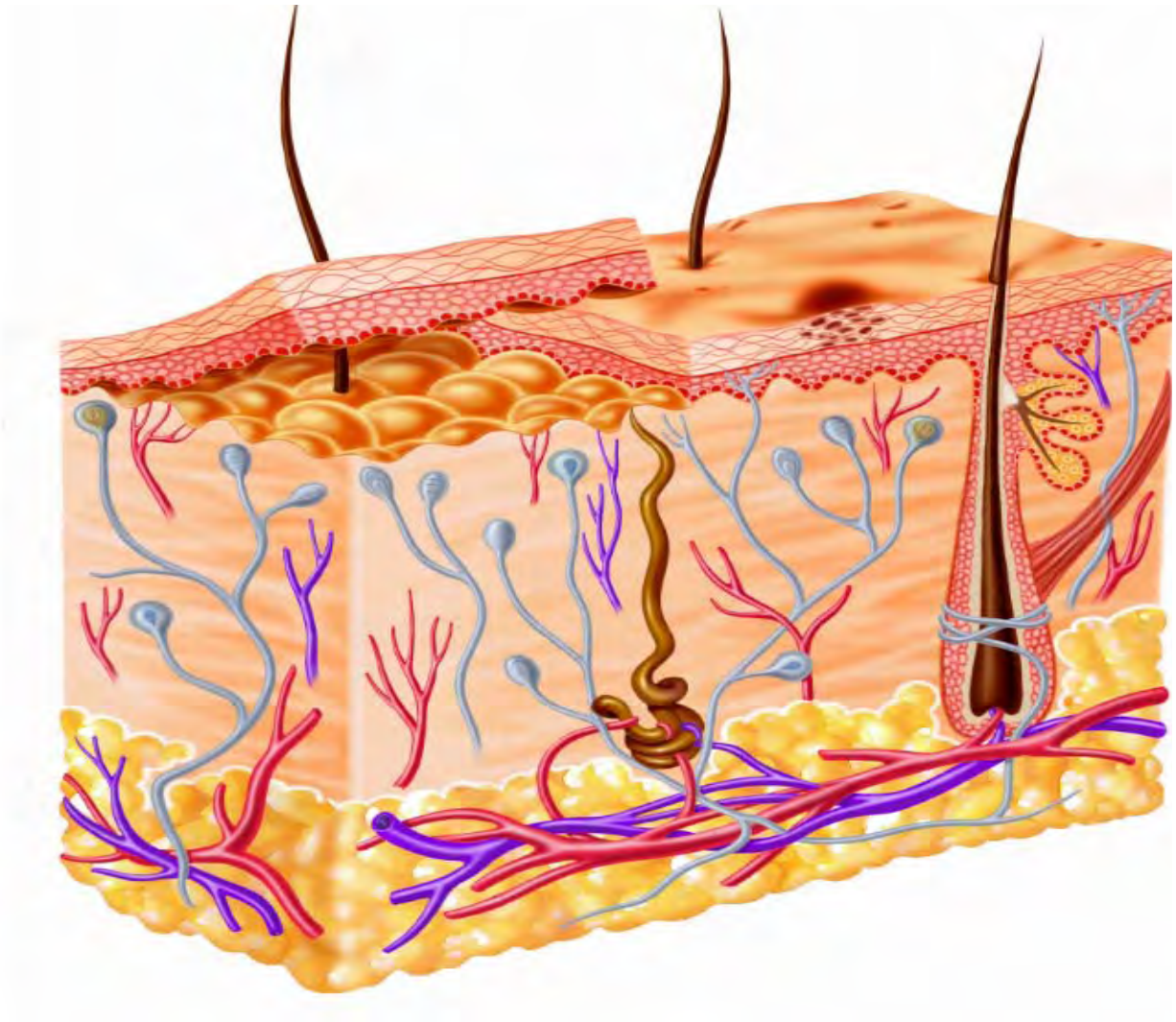
- Poster of cross-section of skin
- Colour photos of skin infections (and simple descriptions)
- Black/white photos of skin infections for colouring in
- Pens/crayons/glue/glitter

Lesson plan outline

Time	Activity	Resource
5-10 mins	Get pupils to tell you what they learnt in the last lesson. • If you get a cut, scratch, graze or insect bite show your parents. • Wash, dry and cover your cut/graze/scratch/bite with a plaster. • Check it every day to see if it's getting better or worse. • Keep your nails clean and short.	Whiteboard
10 mins	Show pupils a colour cross section of the skin. *Stick a colour poster on the wall or use the projector*. Explain that there are 3 layers. The top layer - *what we can touch* (also called the epidermis), the middle layer - *what we can't touch* (called the dermis) and the bottom layer - *the deepest layer* (called the subcutaneous layer). Tell students that when germs get into the top layer of our skin (the epidermis) they don't do any damage. This is when you get a scratch or cut or graze that	Poster of cross section of skin

	gets better after a few days. ***Remember to wear a plaster!*** Sometimes though germs get in to the other layers of the skin (the dermis and the subcutaneous layers). When this happens they are harder to get rid of and can sometimes make us sick. When this happens the cut or graze or spot or insect bite doesn't go away after a few days and you get a **skin infection**. Explain to students that when someone gets a skin infection the germs are really strong and they need special medicine from the doctor to get better.	
10-15 mins	Show students photos of skin infections with names under each one. Say the names out loud and get the pupils to practice saying them too. Put the pupils into groups of 2 or 3 and get them to describe what each picture looks like. Prompt them here if you need to. This can also be done as a whole class activity.	Skin infection photos
5-10 mins	***Extra activity: give the pupils short simple descriptions of each skin infection and get them to match them up. Teacher can read these out and pupils can say which picture they each go with.***	**Short descriptions**
15 mins	Ask students how they would feel if they got a skin infection. Elicit words like sad, sore, itchy, etc. Pupils can draw these feelings. Alternatively give pupils black and white photos of skin infections that they can colour in. **Extension activity: Pupils can make posters for the various key messages from this unit on skin health**	Whiteboard Black/white photos of skin infections Colouring in materials

Part 4 Handout: Poster of cross section of skin



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Part 4 Handout: Simple definitions for skin infections

Red lumps or very large pimples. They can sometimes be itchy or hurt.
Blisters or sores with a yellowish colour. They can be itchy.
Red skin that feels warm and sore. There may be pus coming out of the skin.
Small blisters that look like a rash and are very itchy.

Part 4 Handout: Colour photos of skin infections

Boil

Cellulitis

Impetigo

Scabies

The following Lesson Plans have been developed for Years 5 and 6 (Ages 9 and 10)

Years 5 and 6 : Looking after your skin lesson plans	
Lesson Plans	**Handouts**
Part 1 - Germs and our skin	Cause and Effect Handout Diagram of the skin for labelling Germs (bacteria) – jpeg image file Skin structure poster
Part 2 – Keeping germs out	Colour pictures of broken skin Handwashing pictures Procedure for washing hands
Part 3 - Skin infections	Poster of cross section of skin Simple definitions for skin infections Colour photos of skin infections: boil cellulitis impetigo scabies
Part 4 – Looking after your skin	Powerpoint slides (not included in this document): High five for clean hands Tips for looking after your skin and preventing skin infections When should I wash my hands?

Looking after your skin lesson plan: part 1
Germs and our skin!

Years 5 and 6 (ages 9 & 10)

Lesson length: 60 minutes approx

Learning outcomes

By the end of this lesson pupils will be able to:

- Understand what germs are and how they can affect us
- Understand how germs can spread
- Understand that the skin is an organ and that it protects us from germs
- Listen to a text and label a diagram (cross section of the skin)

Resources needed:

- Photo/still of germs
- Bottle of glitter, bowl, water
- Computer and projector for video clip
- Internet access for http://www.brainpop.com/health/bodysystems/skin **You can access this website through a free 5 day trial or pay a subscription fee.**
- Diagram of the skin for labelling
- Cause and effect handout
- Skin poster (for alternative labelling activity)

Lesson plan outline

Time	Activity	Resource
5 mins	Show pupils still of germs and ask them what they think this is. Tell them it's something that is very small (we can't see it/them), it's all around us but it can also make us sick if it gets into our bodies. Try to get the word 'germ(s)' and write up on the board.	Photo/still of germs
10 mins	Spend some time talking about germs. For example could have a conversation around the following: **<u>What are germs?</u>** Tiny, invisible living creatures that are everywhere. Need a microscope to see them. If too many get inside our bodies they can make us really sick and we might need to go to the doctor. **<u>Good and bad germs.</u>** Some germs (bacteria) that live in our stomachs are good bacteria and help us break down (digest) the	Whiteboard

	food we eat. **<u>Where do germs live?</u>** Germs live everywhere and especially like damp and dirty places. Some of their favourite places are dirty floors, toilets, money, rubbish bins and animals.	
10 mins	Tell pupils that germs can spread quickly and easily. Demonstrate this through the glitter activity. Get one volunteer to wet their hands and dip them in the glitter bowl so that the glitter sticks all over their hands. Explain to the class that in this activity the glitter is 'germs'. The volunteer shakes hands with 3 other pupils who in turn shake hands with 3 more pupils until all hands have been shaken. Get the pupils to look at their hands and see how much glitter or germs are on them. Tell students that this shows how germs can travel by touch. *Alternative activity: fill a balloon with glitter, hold it up high and then pop it. The glitter should spread around the room which shows how easily germs can spread through the air.*	Glitter, bowl, water
5 mins	Ask pupils to name some organs they have. Write them up on the whiteboard e.g. heart, brain, stomach lungs etc (pupils might need a bit of prompting with this as they might not know what an organ is). Ask pupils what is the largest organ in the body? Answer: skin. Give them clues e.g. it's all over our bodies, it's soft, it can be different colours etc.	Whiteboard
30 mins	Show the video clip from: http://www.brainpop.com/health/bodysystems/skin and get pupils to fill in the diagram. **You can access this website through a free 5 day trial or pay a subscription fee.** This clip is narrated with an American accent but this won't be a problem. There is some fairly technical vocabulary that will be new to pupils such as **cells, pigment, melanin, regenerates, elasticity** and **insulation.** Give pupils a few minutes to look at the diagram of the skin and guess what the different parts might be called. Explain that they will listen to a short clip and label the diagram with the words in the box. *You might want to go through the pronunciation of these words so pupils can recognise them when they are mentioned in the clip.* Play the clip but **pause at key points** to help the	Computer, internet connection and projector, diagram of the skin

	pupils comprehend what they are listening to. For example, you could pause at the following points: **0:39** show pupils what a square inch looks like and get them to think about how many skin cells they have in this area (20 million!) **1:03** get pupils to tell you what the skin does (what its purpose is): • stops germs from getting inside our body • stops bumps and bruises from damaging our internal organs • stops our organs from falling out **1:20** get pupils to label the diagram with **epidermis**. Get them to listen for what the epidermis does/why it's important. **2:29** get pupils to label the diagram with **dermis** and listen for why the dermis is important **3:16** get pupils to label **hair, sweat gland and sebaceous gland** **3:21** get pupils to label the **subcutaneous tissue** and listen for what this layer of the skin does Feedback at the end of the clip. If you prefer, you can use the larger poster which shows the cross section of the skin for the above activity. Pupils listen to the clip and label the parts as they understand them. *Optional homework activity: Give pupils the handout 'cause and effect' and get them to write what their bodies would be like if they didn't have the following skin structures: (melanocytes, hair follicle, sweat gland, subcutaneous layer)*	Cross section of skin poster Cause and effect handout

Part 1 Handout: Cause and Effect Handout

BrainPOP

GRAPHIC ORGANIZER

ACTIVITY

Name: .....

Date: September 28, 2012

HEALTH > BODY SYSTEMS > SKIN

CAUSE & EFFECT

Your skin keeps you healthy and comfortable in many different ways. Identify each of the structures in the left column. In the right column, describe how your health and quality of life might be affected if your skin lacked these structures.

CAUSE	EFFECT
	....
	....
	....
	....

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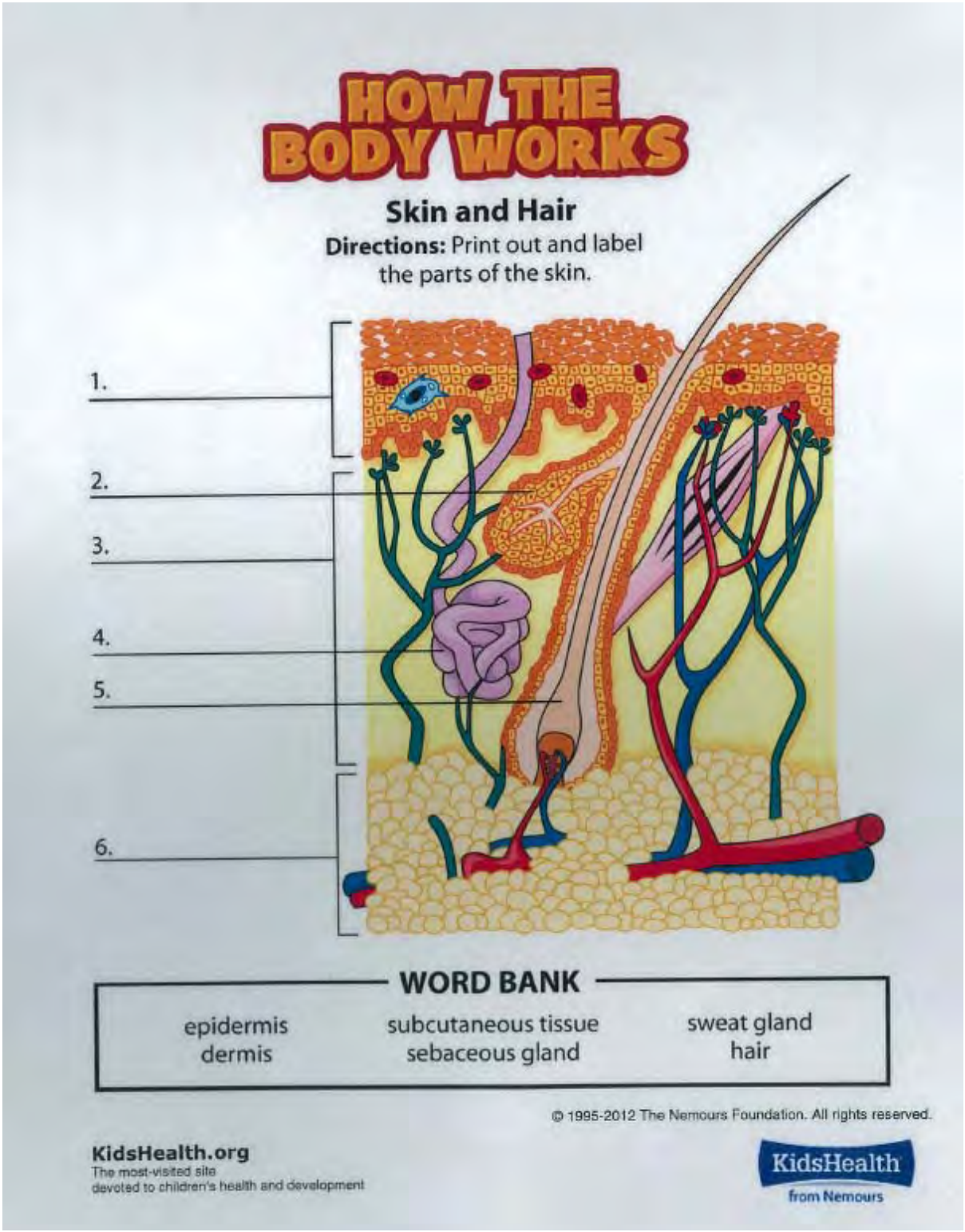
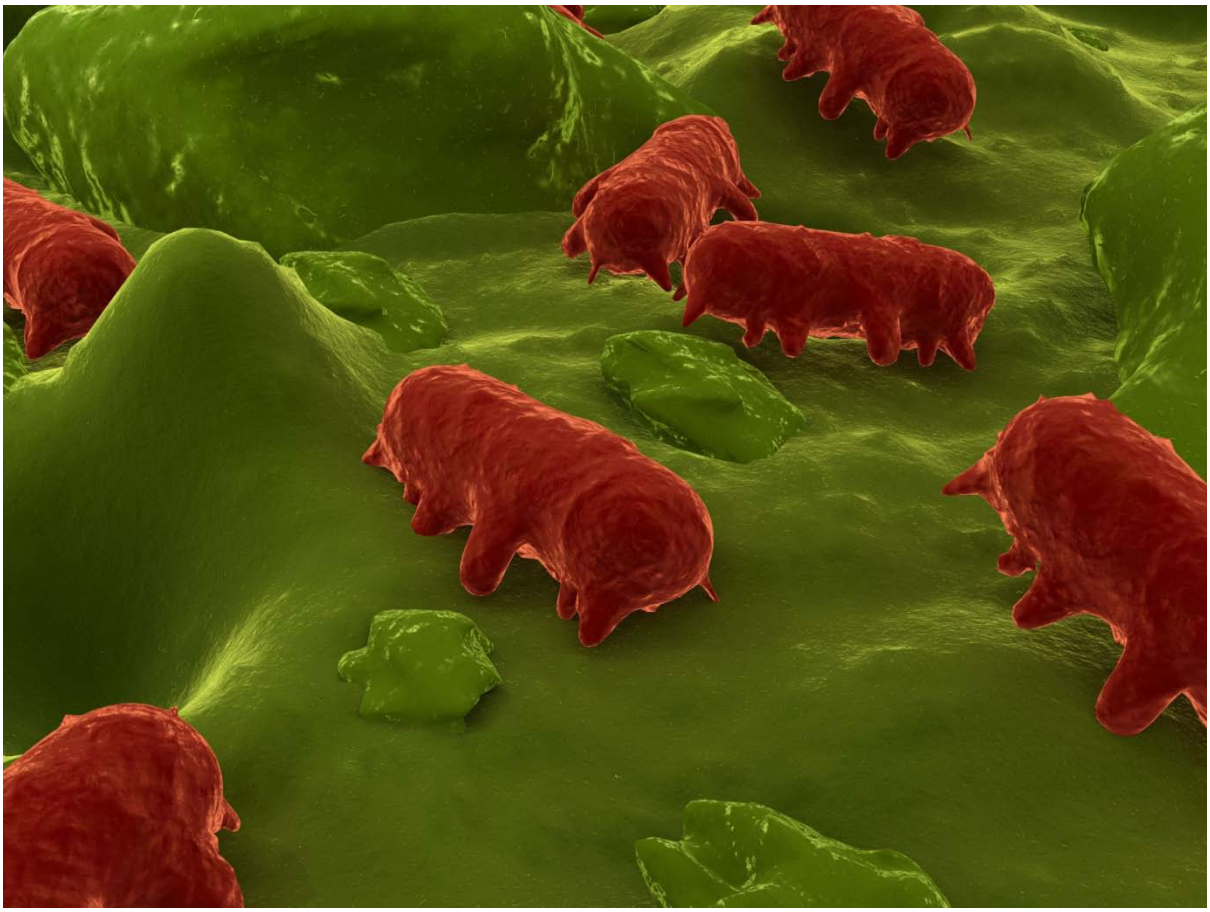
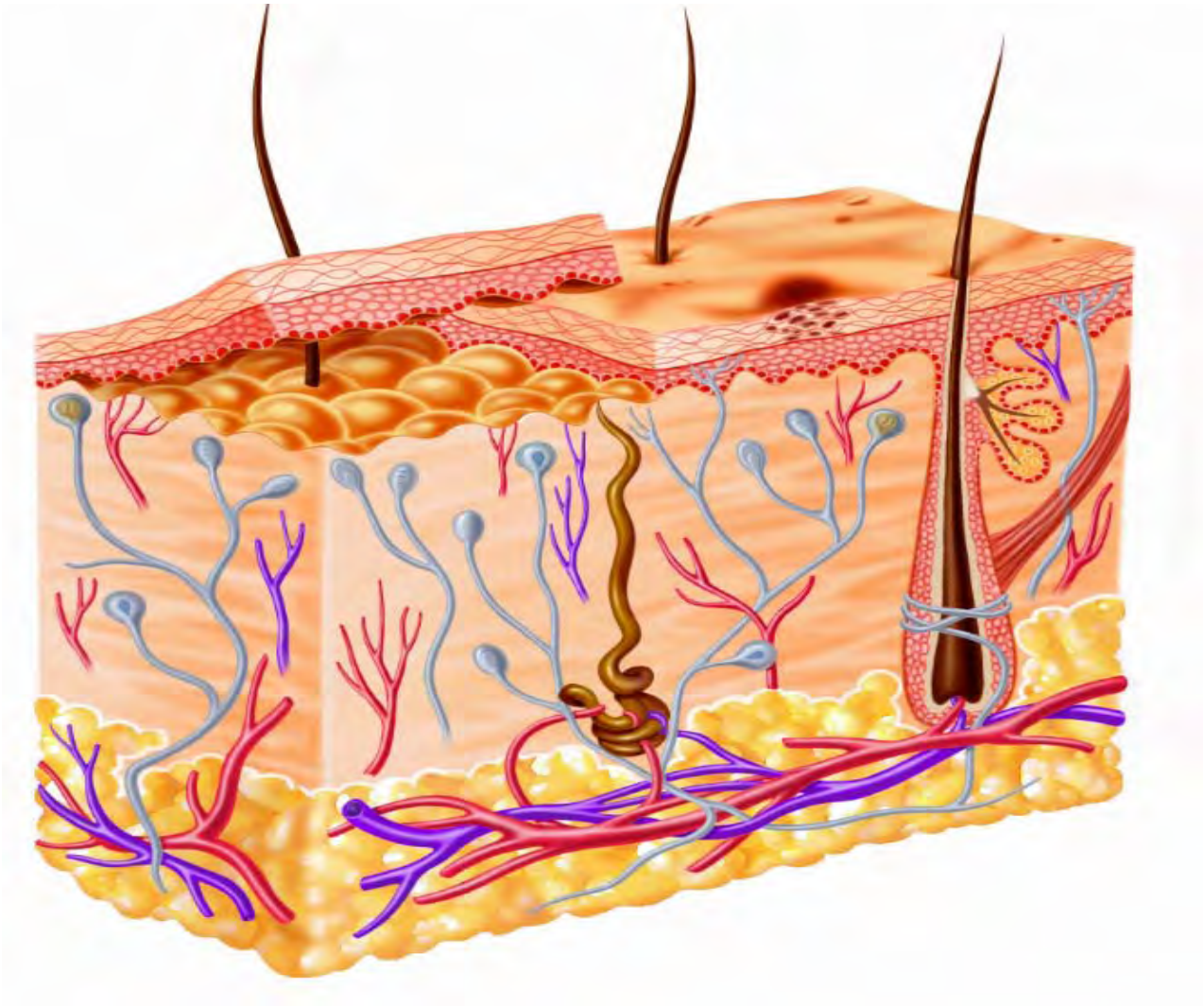
Part 1 Handout: Diagram of the skin for labelling



Part 1 Handout: Germs (bacteria) – jpeg image file



Part 1 Handout: Skin Structure poster



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Looking after your skin lesson plan: part 2
Keeping germs out!

Years 5 and 6 (ages 9 &10)

Lesson length: 50 – 60 minutes approx

Learning outcomes

By the end of this lesson pupils will be able to:

- Understand the importance of proper hand washing in controlling the spread of germs
- Be able to organise and follow a procedural text on how to wash your hands
- Understand what broken skin is and identify examples of this
- Know what do if they have a scratch/bite/graze or cut to their skin

Resources needed:

- Hand washing cards and instructions - you may need several sets of cards
- Colour pictures of broken skin

Lesson plan outline

Time	Activity	Resource
5 mins	Start by asking pupils to tell you what they learnt in the last lesson, e.g. - There are good germs and bad germs - Germs spread easily and by touch - Our skin is what protects us from germs Tell pupils that one of the best ways to stop germs spreading is by washing our hands properly.	Whiteboard
10-15 mins	Ask pupils when they wash their hands and write up their answers on the board. Could divide into before and after and both before and after e.g. before eating or touching food, after going to the bathroom, and before and after visiting someone in the hospital.	Whiteboard
10 mins	Put pupils in pairs or groups of 3. Give each pair or group a set of pictures and descriptions on hand washing and ask them to match them up and then put them in order. Go though the correct procedure once everyone is finished. 1. Wet hands under warm running water	Hand washing cards

	2. Put soap on your hands 3. Rub hands together until the soap makes bubbles 4. Rub on both sides of both hands 5. Rub in between the fingers 6. And round each palm 7. Rinse all the soap off under clean running water 8. Dry your hands for 20 seconds Pupils test each other on the 8 steps and practice washing their hands at break time.	
10 mins	Tell pupils that even though we might wash our skin really well, germs can still sometimes get in. Show the class colour photos of broken skin and elicit what they can see in each one, e.g. cut, scratch, graze, insect bite. Write the words up on the whiteboard and extend by asking how we get these, examples of insect bites etc. Pupils can show each other any examples of broken skin they have and explain how they got it.	Photos of broken skin
10 mins	Tell pupils that when germs get into our bodies through broken skin they can sometimes make us sick. Tell pupils that they should do three things when they get a scratch, cut, graze or insect bite. 1. **Show** your parents and **tell** them how you got it. 2. Get your parents to **help** you **wash** the cut, scratch or graze with warm water, **dry** it with a clean towel, and **put** on a plaster. This will keep the germs out. 3. With your parents, **check it** every day to see if it's getting better. If it's not better after a few days you should go to the doctor or pharmacist.	Whiteboard

Part 2 Handout: Colour pictures of broken skin

Part 2 Handout: Handwashing pictures

All images taken from MOH ‘high five for clean hands’ resource code HE2201

Part 2 Handout: Procedure for washing hands

Wet you hands under running water. Warm water is best.
Put soap on your hands. Liquid soap is best.
Rub hands together until the soap makes bubbles.
Rub both sides of both hands.
Rub in between fingers and thumbs.
Rub around the palm of each hand.
Rinse all the soap off under clean running water. Warm water is best.
Dry your hands for 20 seconds. If you are home use a clean, dry towel. If you are out use a paper towel.

Looking after your skin lesson plan: part 3
Skin infections!

Years 5 and 6 (ages 9 & 10)

Lesson length: 50 minutes approx

Learning outcomes

By the end of this lesson pupils will be able to:

- Understand the relationship between broken skin and skin infections
- Understand what skin infections are and be able to describe what some common examples look like
- Know what to do if they have broken skin or a skin infection

Resources needed:

- Picture of cross section of skin
- Pictures of skin infections with descriptions

Lesson plan outline		
Time	Activity	Resource
5 mins	Go over main points from previous lesson e.g.: - Washing hands is one of the best ways to stop germs spreading. - You should wash your hands regularly and thoroughly (20 seconds for washing and 20 seconds for drying). - You should wash, dry and cover broken skin with a plaster. - Show your parents any cuts etc you have especially if they are not getting better after a day.	Whiteboard
10 mins	Show pupils a colour cross section of the skin. *Stick a colour poster on the wall or use the projector*. Explain that there are 3 layers - does anyone remember what they are called? The top layer - what we can touch (also called the epidermis), the middle layer - what we can't touch (called the dermis) and the bottom layer - that is the deepest layer (called the subcutaneous layer). Tell pupils that when germs get into the top layer of	Cross section of skin

	our skin (the epidermis) they don't do any damage. This is when you get a scratch or cut or graze that gets better after a few days. ***Remember to wear a plaster and to check every day to make sure it is getting better!*** Sometimes though germs get in to the other layers of the skin (the dermis and the subcutaneous layers) and they are harder to get rid of and can sometimes make us sick. When this happens the cut, graze, spot or insect bite doesn't go away after a few days and you get a **skin infection**. Explain to pupils that when someone gets a skin infection the germs are really strong and you need special medicine or antibiotics from the doctor to get better.	
15 mins	Show pupils photos of skin infections with names under each one. Say the names out loud and get the pupils to practice saying them too. Put the pupils into groups of 2 or 3 and get them to describe what each picture looks like. Write their ideas up on the whiteboard. This can also be done as a whole class activity.	Pictures of skin infections and descriptions
5 mins	Give the pupils short simple descriptions of each skin infection and get them to match them up. Feedback when everyone is finished. Remind pupils that hygiene is really important - especially when you have a bad cut, scratch, insect bite graze or a skin infection.	
10 mins	Ask for examples of this and write these up on the w/board e.g. • Good frequent hand washing • Wash, dry and cover cuts, scratches etc and check daily • Tell or show your parents if your cut, scratch, etc. is not getting better after a day • Daily baths or showers with soap • Wash clothes regularly • Don't share clothes or bedding if you have a skin infection Pupils write these key messages in their notebooks.	Whiteboard

Part 3 Handout: Poster of cross section of skin

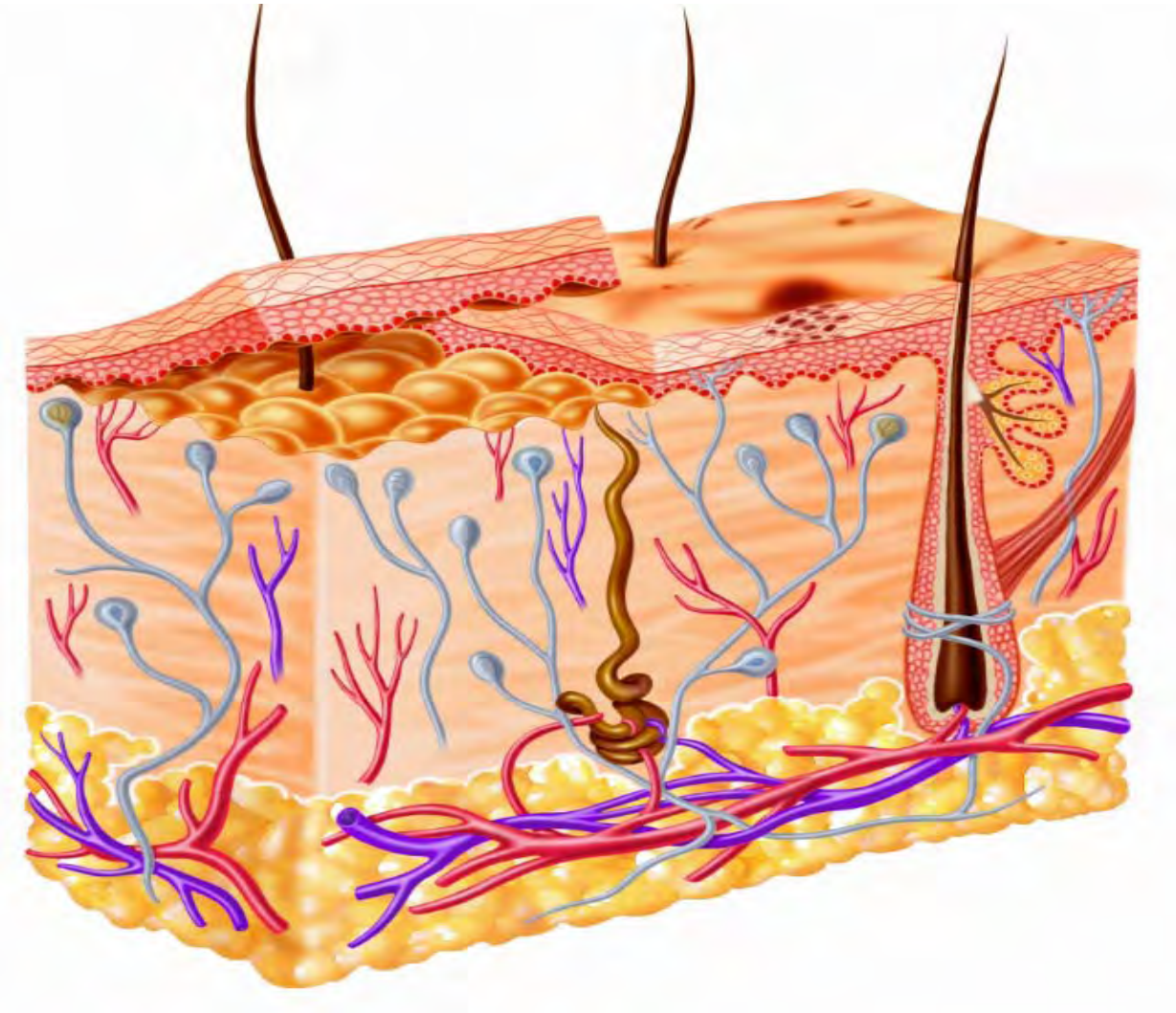

Image purchased from Istockphoto

Part 3 Handout: Simple definitions for skin infections

Part 3 Handout: Colour photos of skin infections

Boil

Cellulitis

Impetigo

Scabies

Looking after your skin lesson plan: part 4
Looking after our skin!

Years 5 and 6 (ages 9 & 10)

Lesson length: 60 minutes approx

Learning outcomes

By the end of this lesson pupils will be able to:

- Consolidate key messages from previous lessons by completing a PowerPoint presentation (written group activity)
- Explain key messages from previous lessons by giving a brief PowerPoint presentation to the rest of the class (spoken group activity)

Resources needed:

- Printed PowerPoint slides without text. Preferably in colour
- PowerPoint slides on computers without text (if there are enough computers)
- Projector (and memory sticks) for presentations

Lesson plan outline

Time	Activity	Resource
30-45 mins	Divide class into groups of 3 or 4 and give each group to a topic: • High five for clean hands • When should I wash my hands? • Tips for looking after your skin and preventing skin infections Either: print off the slides (in colour if possible) or get each group sitting around a computer with the power point slides up on the screen. Tell each group to write a description for each slide - they don't have to write a lot just enough to explain the message in each slide. Walk around and help out as needed.	Computers or printed slides
20-30 mins (depending on time, might need to finish presenting the next	Get each group to present their information to the rest of the class. If they have done this on their own computer they can attach this to the projector and present to the class. Or use a memory stick to transfer to the teacher's computer which is already connected to the projector If they have written their descriptions/captions out,	Computers, projector and memory stick (if required)

day)	they can use the teacher's computer and read off their paper copies as they present their slides. ***Extension task for project: Pupils can research their own skin infection and present to the class. Need to include information of how to prevent or treat the skin infection***	

Appendix 9. Feedback gathered from the trial

Feedback from health practitioners

Role	Resource and comments
PHN	**Booklet** Group response from PHNs in Pukekohe. Generally the resources are great and very badly needed. Provided some edits to text needed to correct errors.
PHN	**Booklet, poster and lesson plans** Group response from PHNs in Clendon. Coloured images in lesson plans stand out for the kids. Lesson plans very clearly structured, interactive and age appropriate. Use of poster with clear images and discussing early signs, treatment and complications was very helpful – both for particular skin conditions and to provide more insight to skin conditions generally. PHNs found that 50 minute lessons were quite long. Would like other visuals such as PowerPoint or flip charts (are these available now?). The poster is great – make it one-sided. Booklets for parents are good.
PHN	**Booklet** Clear concise, families loved the pictures. Maybe add a reasonable time frame for recovery. You say what to do if it gets worse but not how long you wait before getting medical attention if it doesn't get better. If I had these resources I would use them with all families who have skin infections. **Poster** Went through poster with parents and caregivers. The poster was useful and showed progress of the problem in one line and what to do. Pictures give clear idea and identification of the problem. The advice given in clear language. Suggest make it single-sided and laminated.
PHN	**Booklet** A very good reference guide for parents. Colour absolutely necessary, hand hygiene, diet very good and promoted discussion.
PHN	**Booklet** Good colour photos, clear guidelines, not too many steps. **Poster** Used resource to discuss issues with families. Clearly laid out, good resource for schools, nurses and caregivers. Parents liked the colour, graphics and how clear the pictures were. Many parents asked about bactericidal soaps and different types of dressings to use. Availability in other languages?
PHN	**Booklet** Excellent resource. Small amount of words, bullet points with good information, picture and info support. Parents wanted their own copy as a resource. Some Te Reo used as key words? May have broader appeal if used more in the information sections. **Poster** Used resource with parents, left poster with families. The pictures were most helpful and the description of how the infection progresses was very informative for many. Parents were able to refer back to the poster if they needed additional help. Smaller version would be great - pocket size.

Role	Resource and comments
PHN	**Booklet** Comprehensive, able to clearly show different types of skin infections which in turn helped one family in particular who were addressing three different types of infections. Again they wanted to keep it as a resource. Different languages would be helpful. **Poster** Used poster in discussion with first aid staff. All liked sizes of the poster, both A3 and A4. Excellent references. Staff felt they could use it when talking with families. Easy to understand. Showing different infections allows staff to compare. Families and staff requested more copies and smaller version to give as a handout. Excellent resource can be used by all health practitioners and in schools. Resource a valuable aid when doing teaching sessions.
PHN	**Booklet** Informative. Families wanted to keep resource wanting to know about alternative treatments. **Poster** Demonstrated poster with parents and caregivers. Poster enabled them to recognise each skin infection. They all like the information given and asked about alternative treatments. Wanted to know what alternative medicines were available!
PHN	**Booklet** Very informative booklet, pictures are great. Parent requesting info on alternative medicines and creams. **Poster** Used resource with families. They loved the pictures and were happy to know the stages of skin problems and when to seek help.
PHN	**Poster** Poster should be one-sided A3. Very useful tool.
Community health worker	**Booklet** Excellent resource. Size great for a handout for families to use for future reference, additional information on hand washing, managing wounds and diet etc. Parents want to know when they will be ready for distribution. **Poster** Went through the poster with family. The photos and size of the poster are excellent for use in kura, schools and ECE as a quick reference - photos and explanations. Parents asked about other home remedies. Consider combining all infections on one poster.
PHN	**Poster** Reviewed poster. Gave poster to parents. Informative, not too much writing, all info relevant. Parents asked what services they could use if their children developed some of these conditions. Term 4 too busy to use lesson plans.
PHN	**Poster** Used the poster with parents and family. Also gave family a copy. Very useful particularly the illustrations and guidelines. Again 1 sided A3 for sick bays and A4-5 for reference.
PHN	**Booklet** Would not include chicken pox or ringworm. Turn the booklet into a flipchart so PHN can more easily present the booklet. Spiral bind the booklet.
PHN	**Poster** Great conversation starter with students regarding skin infections. Students loved the visuals. The poster is already out in the health centre in the sick bay as a resource. Several students have asked

Role	Resource and comments
	how to get rid of boils and are asking many questions.
PHN	**Poster** Used poster with families, all liked how visual it was. Laminated copies would be great. Excellent resource. Need for pictures of measles and mumps if we include chicken pox.

Feedback from teachers on the lesson plans for skin infections

Role	Pupils	Resource and comments
Deputy Principal	Whole school	**Lesson Plan Yr 2-3. Germs and our skin** Read all lesson plans to see how they could be adapted and used within the current school programme. All lesson plans were useful, Yr 2-3 unit was excellent. Could be broken down so part 1-2 is done in Yr 1 then Part 2-3 done in Yr 2. Health lessons need to have a repetitive and extension component to ensure that it is instilled in the students. Year 3-4 could revisit and then be extended. Skin infections, bites and cuts are very appropriate to Yr 3-4 as they often come back from Christmas holidays in the Islands and are covered in sores from insect bites aggravated by the heat. Y5-6, Part 3.This is where acne and pubertal changes can be addressed in terms of personal hygiene, skin and hair changes, etc. Looking after your skin Part 4 attention to diet, hygiene, cleanliness, skin routines and products (deodorant, etc) could be covered here. There is a real need for units like this at all levels need to cover personal hygiene each year so a mini series of lessons related to this for one week would be a valuable resource. Remember to include nails: cutting, cleaning and filing. Thank you. I believe this resource could be adapted and used to create an integrated unit to use school wide at the beginning of each year. There are some APP sites and interactive whiteboard tasks that could be developed. The NZ curriculum for health does not emphasise personal hygiene and responsibility but it could be addressed within the Social Science curriculum areas.
Year 2-3 teacher	32	**Lesson Plan Yr 2-3. Germs and our skin** Very detailed plans, help to inform teachers to use the correct vocabulary. It is helpful to have the resources and websites organised in the plan. I liked the way the plans flowed and the approximate times. The students liked the video clip on brainpop as it was interactive, bright and well-explained. The glitter activity is a good example of how germs can spread, they enjoyed discussing this. The plan was a little too long - I would cut it down to 45 minutes. It is a lot of information for one lesson. I would create some resources to use during the reading which link to this resource. It would be helpful if it was linked to the NZ curriculum by showing which AO's the teacher

Role	Pupils	Resource and comments
		is covering (Science/Health)
Year 2-3 teacher	28	**Lesson Plan Yr 2-3. Germs and our skin** Fantastic resource. Easy to use, well resourced with pictures and great IT links. The students clearly enjoyed the glitter lesson and were really impressed, really graphically showed students how germs are spread.
Year 2-3 teacher	28	**Lesson Plan Yr 2-3. Washing your hands** Great resources. Easy to use. Hand washing logically not possible in a group setting as we have hand sanitiser units in the classroom - maybe some photos of these units and the correct way to use the gel would be valuable. Resource could be referred to throughout the year.
Year 2-3 teacher	31	**Lesson Plan Yr 2-3. Germs and our skin** Clearly set out, easy to follow. The students like learning about their skin and the video clip was fantastic. They clearly enjoyed learning about how easy germs spread and loved the glitter activity. Working with 7-8 year olds we explored the bacteria/germs definition more. The children really engaged with the lesson - the website was fantastic.
Year 2-3 teacher	31	**Lesson Plan Yr 2-3. Washing your hands** Easy to follow. The challenge was ordering of the photos. Children were very surprised how hand washing was more involved after completing the list of photos. I would change the lesson time to possibly 2 x 30 minute blocks for hand washing (section 3) allowing for much more dialogue by students. We did this just before lunch and children were very aware of what they had to do. We have decided to have a class procedure for leaving the room before lunch and morning tea times. Additional comments: photos are of soap and water which are not available in classes and not practical for the toilet areas as required for eating times. So would like to see photo resources available demonstrating the hand sanitiser units that all schools should have in their classrooms.
Year 2-3 teacher	34	**Lesson Plan Yr 2-3. Washing your hands** Well planned, very easy to follow. The resources supplied cater for time management and were interactive for the children. Students shared their experiences, engaged in group work, putting labels and pictures and sorting out what goes with what. Students enjoyed the whole session. They responded well and enjoyed doing it. Maybe add a little video of children washing hands and talking about the importance of hand washing.
Year 2-3 teacher	34	**Lesson Plan Yr 2-3. Washing your hands** A fantastic resource that I believe needs to be taught

Role	Pupils	Resource and comments
		thoroughly in Term 1 weeks 1 & 2 and at the beginning of Terms 2 & 3 (flu season). There is a revisit (short snap resource) that reminds children of Term 1. This can be used in the classroom throughout the year as required should there be an outbreak of school sores, in particular chicken pox, vomiting etc.
Year 3 teacher	34	**Lesson plan Yr 2-3. Scratches, bites, cuts and grazes** Very easy to use and follow and relevant to children's knowledge and experiences. The students liked to be able to share their own personal experiences. What I would like to add is explore the definitions of types of scratches, bites and cuts - the importance and reasons being adults knowing the source of the injury. Would be great as part of an introductory health unit in Term 1, as well as being revisited regularly. Another comment, it didn't take as long as stated.
Year 5 teacher	29	**Lesson Plan Yr 5-6. Germs and our skin** Reviewed all lessons plans for Yr 5-6. Specifically liked the time frames. Also recap of last lesson and the exact steps of what to expect from each lesson. Thought the students would like matching the descriptions and making skin safe posters with maybe a catchy phase, e.g. slip, slop, slap. They would definitely like the brainpop info, as it is so interactive, and the challenge of how the skin works, etc. The hand washing session would be enjoyed by all .The students may not like some of the pictures as they were quite graphic however over time, they would get used to them. Overall a fantastic resource for any teacher to add to their tool kit.