Control of scabies

A guide for national programme managers

World Health Organization

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Contents

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Abbreviations

DALY	disability-adjusted life–year
EPRP	emergency preparedness and response plan
EU	evaluation unit
HSS	health systems strengthening
IACS	International Alliance for the Control of Scabies
IDM	intensified disease management
IEC	information, education and communication
IU	implementation unit
M&E	monitoring and evaluation
MDA	mass drug administration
MRSA	methicillin-resistant *Staphylococcus aureus*
NGO	nongovernmental organization
NTD	neglected tropical disease
WASH	water, sanitation and hygiene
WHO	World Health Organization

Glossary

The definitions below apply to the terms used in this document. They may have different meanings in other contexts.

Classical (or common) scabies

A common form of scabies caused by the *Sarcoptes scabiei* var. *hominis* mite, characterized by itching (usually intense, especially at night) and skin lesions such as papules, vesicles, nodules or burrows. Typically, an infestation involves 5–15 mites, leading to hypersensitivity reactions to the mites, their eggs and faeces. Lesions are typically found on the hands, wrists, elbows, genitalia and other common sites.

Confirmed case of scabies

A case of suspected scabies verified through the identification of mites, mite eggs or mite faeces by highly skilled clinicians (usually dermatologists) using methods such as light microscopy, dermoscopy or high-powered imaging devices.

Contact

A person who does not fulfil the clinical criteria or a person without signs and symptoms consistent with scabies who has had direct contact (particularly prolonged, direct skin-to-skin contact) with a suspected or confirmed scabies case in the 2 months preceding the onset of scabies signs and symptoms in the case.

Crusted scabies

A rare, severe and highly contagious form of scabies characterized by the presence of plaques and extensive crusts or scales containing millions of mites. Sometimes, it is associated with a variable degree of erythema and carries a higher risk of transmission and mortality. Crusted scabies occurs more frequently in immunosuppressed individuals and is a common cause of institutional outbreaks.

Emergency preparedness and response plan (EPRP)

A process that allows a permanent intervention capacity to be established in order to respond to humanitarian emergencies.

Evaluation unit (EU)

Geographically defined areas for assessment of disease prevalence that can comprise multiple implementation units, or part of an implementation unit. An EU is generally in the population range of 100 000–250 000.

Health systems strengthening (HSS)

Activities, policies and strategies designed to enhance the performance of a health system and improve health outcomes. WHO identifies six core building blocks of HSS: health service delivery; health workforce; health information systems and surveillance; access to essential medicines; health financing; and leadership and governance.

Implementation unit (IU)

Geographically defined areas or population groups for organizing, delivering and monitoring health interventions, such as disease control programmes. A population of approximately 100 000–150 000 would be an appropriate IU for both mapping and interventions.

Intensified disease management (IDM)

Individual case detection and treatment of scabies through health services incorporating treatment of household contacts.

Mass drug administration (MDA)

Administration of medications to whole populations irrespective of individual disease status and without the necessity of prior diagnosis.

Prevalence of infection

The proportion, expressed as a percentage, of a population who has the infection.

Prevalence survey

Survey of a representative sample of individuals within a specified EU to determine disease prevalence.

Rapid mapping

Survey based on a convenience sample to provide crude estimates of disease burden.

Sentinel site

A clinical or community location, selected in order to collect disease prevalence data on an ongoing basis to monitor the success of the programme.

Suspected case of scabies

A person presenting with intense itching (especially at night) and characteristic skin lesions, such as papules, nodules or burrows, in typical areas of distribution (e.g. hands, wrists, fingers, groin, peri-umbilical region). In infants, lesions may be more widespread, involving the trunk, scalp, palms and soles. A suspected case is further supported by a history of contact with an individual diagnosed with or suspected to have scabies.

Executive summary

Scabies is estimated to affect 200 million globally, with a higher burden in low-income settings and tropical regions, particularly among infants, children and adolescents. Human scabies is a skin disease caused by the mite *Sarcoptes scabiei* var. *hominis*, a human-specific ectoparasite that infests the epidermis, triggering a hypersensitivity reaction that causes itching and small scattered papules, often accompanied by excoriation. Scabies infestation produces breaks in the skin that are susceptible to secondary infections, such as impetigo, and more serious complications, including cellulitis, necrotizing fasciitis and bloodstream infections. Scabies is transmitted by direct skin-to-skin contact, so that individuals living in overcrowded environments in the poorest of the world's communities are particularly susceptible. In 2017, the World Health Organization (WHO) designated scabies as a neglected tropical disease (NTD). The aim of this document is to provide guidance for countries on how to implement programmes for the control of scabies. This will include estimating the disease burden, rolling out control measures, and establishing effective monitoring and evaluation (M&E) systems.

The first step in developing a scabies control programme is mapping to assess the disease burden, measured as scabies prevalence at the community level or within specific target populations. Mapping helps identify areas exceeding the threshold for implementing different control strategies and guides decision-making regarding the appropriate control strategy based on the scabies burden in the community. Mass drug administration (MDA) is one of the main implemented strategies for the control of scabies and has been shown to reduce scabies prevalence significantly in high-burden communities. Alternatively, intensified disease management (IDM), which focuses on identifying and treating individual cases and their close contacts, is a viable option, particularly in areas with lower scabies prevalence or where logistical challenges make MDA difficult to implement.

Disease prevalence may be estimated by rapid mapping, which generates approximate estimates to identify areas where scabies is a public health problem, and by prevalence surveys to refine the estimates. Scabies diagnosis may be challenging due to the variable presentations and the unspecific nature of itching. The International Alliance for Scabies Control (IACS) has developed consensus criteria for diagnosing common scabies, where confirmed diagnosis requires high clinician skill and specific equipment and may not be applicable in certain situations. In contrast, clinical diagnosis and suspected diagnosis criteria may be applicable by healthcare workers in primary care and are the feasible criteria in clinical settings and field surveys, particularly in low-income settings. Rapid mapping is based on a simplified version of the 2020 IACS criteria and entails a simplified skin examination of the arms and legs for typical scabies lesions in a typical distribution, with either itch or positive contact history. Trained nurses or healthcare workers should perform this rapid skin assessment, which is essential for identifying communities with prevalences that require public health actions. Rapid mapping should follow a community-based house-to-house sampling strategy whenever feasible, while school surveys and central point examination may serve as alternative approaches. Conversely, prevalence surveys should be conducted in areas of concern or in those programmed to be followed longitudinally as sentinel sites. Before starting any action, a baseline prevalence survey during the pre-campaign phase may be conducted to determine the prevalence of scabies and impetigo, providing a baseline to monitor the impact of control strategies, and to determine the appropriate control strategies. Surveys should use the most accurate diagnostic method feasible in each setting and should be designed to determine age- and gender-specific community prevalence.

Once the pre-campaign phase has identified the need for action and implementation of a scabies control campaign in a community, a communication, multisectoral coordination and response strategy to contain the spread of the disease must be developed. Scabies control programmes should be organized, delivered and monitored in defined areas or population groups, the implementation units (IU), with a population of approximately 100 000–150 000 individuals. The campaign should include health system strengthening (HSS) and IDM regardless of the estimated prevalence of scabies. MDA should also be performed in settings where the prevalence is > 10%. For prevalence of 2–10%, the decision to utilize only HSS and IDM or conduct MDA depends on local considerations. HSS includes activities, policies and strategies designed to enhance the performance of a health system and improve health outcomes and is a critical component of scabies control programmes since the condition disproportionately affects marginalized communities with limited or no access to effective treatment. IDM strategies focus on enhancing clinical care in primary healthcare clinics, raising awareness, training healthcare workers, recognizing and referring cases of suspected crusted scabies, strengthening and supporting routine collection, analysis and reporting of data on scabies presentations, and active case-finding.

Before initiating MDA, a pre-MDA phase should set the bases for its effective implementation by determining the burden of scabies, ensuring the availability of treatment supplies, and ensuring an effective multisectoral coordinated MDA. The MDA implementation phase consists of the administration of oral ivermectin (200 µg/kg body weight) and, in individuals with a contraindication, topical treatment with 5% permethrin. Ivermectin dosing approaches based on age, height and body shape may be feasible alternatives in specific settings where weight-based dosing using scales poses challenges for large-scale MDA. Two doses of ivermectin administered at least 7 days apart may be necessary to treat the scabies infestation fully. The minimal target coverage for MDA is 80% of the total population in the IU. Despite the limited evidence to inform the optimal number of rounds of MDA, the current recommendation is that the MDA should consist of 3–5 annual rounds, depending on the geographical context of the IU. Impact assessments conducted yearly or at the end of years 3 and/or 5 should help determine when to stop MDA. The World Health Organization (WHO) recommends stopping MDA once the prevalence of scabies is reduced below 2%. However, this threshold may be unrealistic in large populations in non-trial settings and, therefore, at prevalences of 2–9%, the decision to stop or continue MDA should be based on local factors.

Once the strategy has been implemented, the prevalence of scabies should be monitored with continuous surveillance at the community level to prevent scabies resurgence. M&E are critical components of the scabies control strategy. A crucial part of M&E is the collection of epidemiological data over time from sentinel sites, such as areas of high transmission identified during mapping, and randomly selected sites. The core M&E indicators throughout the campaign implementation phases are disease prevalence, treatment coverage, serious adverse events, process indicators, including evaluation of the staff training programme and community sensitization, and episodes of care routinely reported by health facilities. Scabies control programmes should be integrated with existing programmes for NTDs, whenever possible.

1. Background

Globally, scabies affects an estimated 200 million people, with approximately 622 million new cases annually (1). However, these estimates are limited by a lack of comprehensive epidemiological data (2). Although scabies infestation occurs worldwide, it has a higher burden in low-income settings and tropical regions, particularly among infants, children and adolescents. Outbreaks are frequently reported in institutional settings and enclosed communities, occurring in both high- and low-income areas, particularly where crowding is present. These outbreaks impose a significant health and economic burden and are often difficult to control (3,4).

The aim of this document is to provide guidance for countries on how to implement programmes for the control of scabies. This will include estimating the disease burden, rolling out control measures, and establishing effective monitoring and evaluation (M&E) systems.

Human scabies is caused by the mite *Sarcoptes scabiei* var. *hominis* and is transmitted through direct person-to-person contact. It is one of the most common dermatological conditions worldwide, especially in tropical regions, particularly in areas affected by overcrowding and poverty (5). Scabies causes debilitating itchiness and social stigmatization and can lead to bacterial infection which, if left untreated, can lead to complications such as septicaemia, glomerulonephritis and chronic rheumatic heart disease (6–10) .The direct effects of scabies are estimated to account for 5.32 million disability-adjusted life–year (DALYs) (1), but the broader impact is likely much greater when complications of bacterial skin infection, invasive bacterial diseases, and auto-immune kidney and heart diseases are considered (2).

In 2017, the World Health Organization (WHO) designated scabies as a neglected tropical disease (NTD), recognizing the need for large-scale disease control action (11). This decision was based on four specific criteria outlined by WHO to justify its inclusion as an NTD (12):

- **Impact on the poor**: Scabies causes and exacerbates the burden of illness of the poorest of the poor living in overcrowded, impoverished conditions with limited or no access to effective treatment. Of the NTDs listed at that time, only soil-transmitted helminthiases and schistosomiasis affect more people globally than scabies and only six listed NTDs cause more DALYs.
- **High prevalence in tropical areas**: Although scabies occurs globally, the highest prevalence is recorded in tropical and subtropical regions, affecting at least 100 million people at any one time. Scabies is frequently complicated by bacterial skin infection (impetigo), which may result in abscesses, sepsis and invasive infections with *Staphylococcus aureus* and *Streptococcus pyogenes*, the latter of which may result in kidney disease and rheumatic heart disease.
- **Treatability**: Scabies is treatable. Not only is there tremendous scope to bring the disease under control with existing WHO strategies against NTDs, with a medicine that is already widely used (ivermectin), but there is also the collateral benefit of eliminating the complications of scabies.
- **Neglect in research**: Scabies was largely neglected in research agendas, and laboratory research, epidemiology, mapping, diagnostics and control strategies have received little investment.

1.1 Process of development

This document was developed under the leadership of the World Health Organization (WHO), through a collaborative and consultative process involving internal WHO staff, external experts and key partners. An initial draft was prepared by a core technical team within WHO, drawing on existing WHO guidance, peer-reviewed literature, and operational experience from scabies control programmes. The draft was informed by contributions from subject-matter experts affiliated with academic and research institutions, as well as technical input from WHO regional offices and headquarters staff.

The document development process was supported by the International Alliance for the Control of Scabies (IACS) and the World Scabies Programme (WSP), whose consensus-based diagnostic criteria and technical expertise informed key sections of the guidance. Financial support for the development of the document was provided by the International Alliance for the Control of Scabies.

The draft underwent iterative internal review within WHO and was subsequently shared with external reviewers, including clinicians, researchers and programme implementers from endemic countries. Feedback from these stakeholders was incorporated, at WHO's discretion, to refine the technical content and ensure programmatic relevance. All external contributors completed WHO declarations of interest, which were reviewed in accordance with WHO policies, and no conflicts of interest were identified.

The final version of the document reflects the consolidated input from WHO experts, external reviewers and partners, and was finalized following internal WHO review and clearance processes.

1.2 Declarations of interest

In accordance with WHO policy, all external experts submitted to the Organization the completed "Declarations of interest for WHO experts" form, disclosing any potential conflicts of interest that might affect, or might reasonably be perceived to affect, their objectivity and independence in relation to the subject matter of this document. WHO reviewed each of the declarations and concluded that none could give rise to a potential or reasonably perceived conflict of interest related to the guidance.

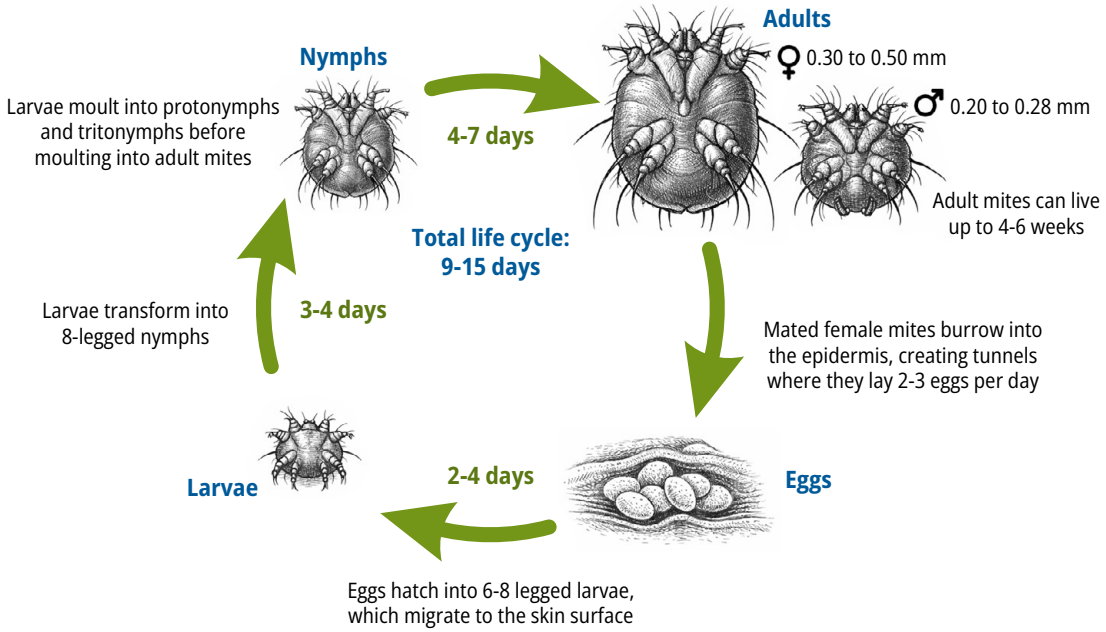
2. The disease

2.1 Causative organism, transmission and clinical features

Scabies is a contagious skin disease characterized by itching and skin eruptions of variable severity. It is caused by the mite *Sarcoptes scabiei* var. *hominis*, a human-specific ectoparasite of approximately 0.4 mm in size, invisible to the naked eye (13,14).

The infestation begins when a fertilized female mite burrows into the skin of an uninfected individual to lay eggs (15) (Fig. 1). After the initial infestation, individuals are typically asymptomatic during an incubation period of 4–6 weeks. However, symptoms develop much more rapidly (within hours to days) upon subsequent infestations (16). Itching and small scattered papules, often accompanied by excoriation, are the most common manifestations, caused by a hypersensitivity reaction to the mites and their products (13).

Fig. 1. ***Sarcoptes scabiei*** **life cycle**



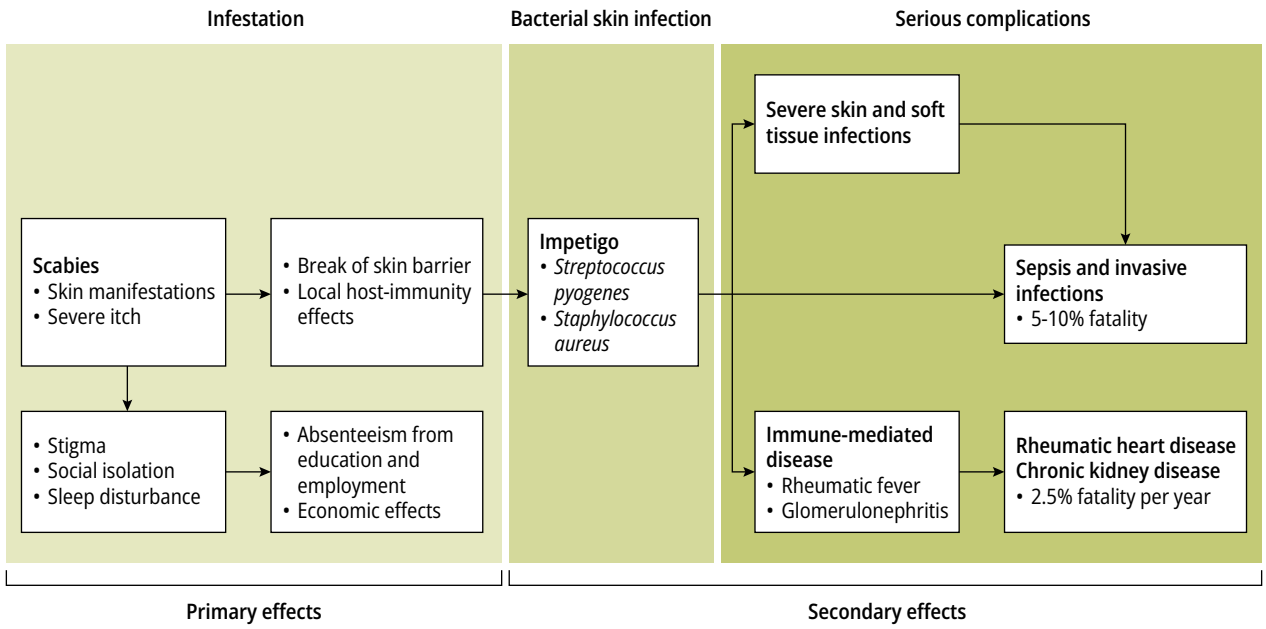
Source: Adapted from Thomas C. et al. Ectoparasites. J Am Acad Dermatol; 2020;82(*3*):533–548.

In "classic" scabies, an infestation typically involves 5–15 mites, causing a hypersensitivity reaction that triggers severe itch, which may interfere with everyday activities such as eating, sleeping, working and studying (12). Secondary skin lesions usually develop, including papules, vesicles and nodules (12). Rarely, patients develop crusted scabies (previously known as "Norwegian scabies"), which is characterized by plaques and extensive scales and/or crusts containing millions of mites, sometimes associated with a variable degree of erythema (12). This form is highly infectious, is associated with mortality (17), occurs more frequently in immunosuppressed individuals and is a frequent cause of institutional outbreaks of scabies (12). Images of scabies lesions are shown in Annex 1.

Scabies is transmitted by direct skin-to-skin contact, so that individuals living in overcrowded environments in the poorest of the world's communities are particularly susceptible. Scabies is not zoonotic and cannot be transmitted to humans from dogs or other animals with sarcoptic mange, which is caused by other genetically distinct varieties of the *Sarcoptes* mite (12). Scabies is not waterborne. Scabies is not associated with poor hygiene. In some regions, skin conditions such as scabies are so common among children that parents may not consider it a reason for seeking medical treatment (18).

Scabies infestation results in breaks in the skin due to scratching that increase the risk of secondary infections. This risk is augmented by the inhibitory effects of infestation on host complement pathways, promoting bacterial colonization (19). Scabies infestation is known to be a major risk factor for impetigo, caused by *Streptococcus pyogenes* and *Staphylococcus aureus*, and is therefore considered a risk factor for more serious infections, including cellulitis, necrotizing fasciitis and bloodstream infections. Several studies have also showed that outbreaks of scabies are a major risk factor for acute post-streptococcal glomerulonephritis (20–23). A growing body of evidence also implicates impetigo caused by S. pyogenes in the pathogenesis of rheumatic fever and rheumatic heart disease (6). Fig. 2 shows the primary and secondary effects of scabies.

Fig. 2. Scabies: primary and secondary effects



Source: https://pubmed.ncbi.nlm.nih.gov/31178154/.

Table 1 summarizes the causative organism, transmission and clinical features of scabies.

Table 1. Scabies: causative organism, transmission and clinical features

Causative microorganism	*Sarcoptes scabiei* var. *hominis*
Reservoir	• Humans *Note*: Scabies cannot be transmitted to humans from other animals with sarcoptic mange, which is caused by distinct varieties of the *Sarcoptes* mite, which can live in humans but do not reproduce.
Mode of transmission	• Transfer of parasites commonly occurs through prolonged direct contact with infested skin and during sexual contact. • Transfer from undergarments and bedclothes is rare and occurs only if infested people have contaminated these immediately beforehand. • Mites can burrow beneath the skin surface about 2.5 mm depth. • Persons with **crusted scabies** are highly contagious because of the large number of mites present in the exfoliating scales of the skin, which can also be found in fomites.

Table 1 *continued*

Incubation period	• In people without previous exposure, 4–6 weeks after infestation will be needed before the onset of itching. • People who have been previously infested develop symptoms in 1–4 days after exposure.
Risk factors	• Scabies can spread easily under crowded conditions, such as in schools, prisons, and refugee camps where close skin-to-skin contact is common. • Severe crusted form of scabies is common in immunocompromised, debilitated, elderly persons.
Clinical features	• Pruritus (itching), usually intense, especially at night. • Presence of burrows, predominantly on hands and wrists, is the most characteristic clinical sign, but often cannot be observed due to scratching, dryness, bacterial infection or skin colour. • Presence of papules and vesicles, predominantly on the hands, wrists, elbows, and genitalia are the most frequent clinical signs. • Blisters and pustules on the palms and soles are characteristic symptoms of scabies in infants. • Finger webs are a predominant site of involvement. • Itching and rash may be generalised or be limited to common sites. • Secondary bacterial infections of lesions (impetigo).

2.2 Diagnosis and differential diagnosis

In response to the lack of standardization of diagnostic methods, the International Alliance for Scabies Control (IACS) led a project to develop consensus criteria for diagnosing common scabies that could be applied in various clinical, research and public health settings (*24*). In some situations, the applicability of these criteria is diminished because they require high clinician skill, may require optical microscopy, magnification or dermatoscopy, and are less sensitive in scabies other than common scabies and in skin of colour.

The 2020 IACS Consensus Criteria for the Diagnosis of Scabies (herein referred to as the 2020 IACS criteria) comprise three levels representing degrees of diagnostic certainty (Box 1). Level A requires hardware for diagnosis (dermatoscope, high-powered skin imaging devices and/or light microscopy of skin scrapings); this level is generally for diagnosis by highly skilled clinicians (usually dermatologists). Use of magnification on the skin (dermoscopy) to diagnose scabies in dark-skinned people is challenging. Level B and C are applicable for use by healthcare workers in primary care.

Overall, we recommend a simplified approach for primary healthcare workers for the diagnosis of scabies that includes elements of the 2020 IACS criteria as follows: typical scabies lesions in a typical distribution with either itch or a positive contact history, where contact history is automatically considered positive if the person is living in a suspected highly endemic region (i.e. prevalence > 10%).

Box 1. Summary 2020 IACS criteria

Level A. Confirmed scabies

At least one of:

- **A1**: Mites, eggs or faeces on light microscopy of skin samples
- **A2**: Mites, eggs or faeces visualised on an individual using a high-powered imaging device
- **A3**: Mite visualised on an individual using dermoscopy

Level B. Clinical scabies

At least one of:

- **B1**: Scabies burrows
- **B2**: Typical lesions affecting male genitalia
- **B3**: Typical lesions in a typical distribution and two history features

Level C. Suspected scabies

One of:

- **C1**: Typical lesions in a typical distribution and one history feature
- **C2**: Atypical lesions or atypical distribution and two history features

History features

- **H1**: Itch
- **H2**: Positive contact history

Diagnosis can be made at one of the three levels (A, B or C).

A diagnosis of clinical or suspected scabies should only be made if other differential diagnoses are considered less likely than scabies.

Source: Adapted from the 2020 IACS criteria (*24*).

Level A: confirmed scabies – the most specific level, requiring direct visualization of the mite or its products. The diagnosis of confirmed scabies can be made through the identification of the scabies mite (adult or immature stages), eggs (ova) or faecal pellets (scybala). This can be achieved through definitive visualisation of: (i) the mite or mite products through microscopic examination of skin samples (subcategory A1); (ii) the mite or mite products using non-invasive, high-magnification devices (A2); or (iii) the mite using dermoscopy (A3) (*24*).

Levels B and C: clinical and suspected scabies – more sensitive than level A, but less specific, relying on clinical assessment of signs and symptoms. The diagnosis of clinical scabies (level B) or suspected scabies (level C) relies on clinical assessment, including features of the patient's history and skin examination. When these features meet the criteria considered adequately specific for scabies, a clinical diagnosis of scabies can be made. A diagnosis of suspected scabies can be made when these features are less specific (*24*).

Each level may be appropriate for diagnosing scabies, depending on the clinical, public health or research setting. For example, level A might be used for clinical trials, while levels B and C may be most suitable for clinical settings and field surveys, particularly in low-income settings (*24*).

History features

H1. Itch (pruritus): It is common in scabies but not universal and typically appears 4–6 weeks after the initial infestation. People with cognitive impairments are less likely to report it. The severity varies, with some experiencing intense itching at night, though this is not unique to scabies. Itching may be localized to the site of visible scabies lesions or generalised to other body parts (*24*).

H2. Contact history: Scabies is transmitted by skin-to-skin contact. Transmission via fomites such as clothing or bedding is rare for common scabies but may occur with crusted scabies. The risk of transmission for common scabies is related to the frequency, duration, and surface area of contact, with the highest risk among those sharing a bed or between children and their caregivers. Although at least 20 minutes of contact is estimated to transmit mites, this is not fully established (*24*). A positive contact history may be defined as per the definitions in Box 2.

Box 2. Definitions for contact history for scabies transmission

Positive contact history: all of the following are considered high risk for scabies transmission

- Any contact with an individual diagnosed with crusted scabies
- Close contact with an individual diagnosed with scabies
- Close contact with an individual with itch that is not accounted for by another condition
- Close contact with an individual with typical scabies lesions in a typical distribution that are not accounted for by another condition.

Close contacts are defined as any of:

- Individuals who sleep in the same dwelling
- Individuals who share a bed (including sexual partners)
- Children in the same classroom or who play closely together
- Adults with known skin-to-skin contact[a]

[a] Examples of skin-to-skin exposures include occupational exposures (healthcare workers, residential care workers, carers and educators of children) and recreational exposures (e.g. contact sports such as wrestling).

Source: Adapted from the 2020 IACS criteria (*24*).

Typical appearance of scabies lesions

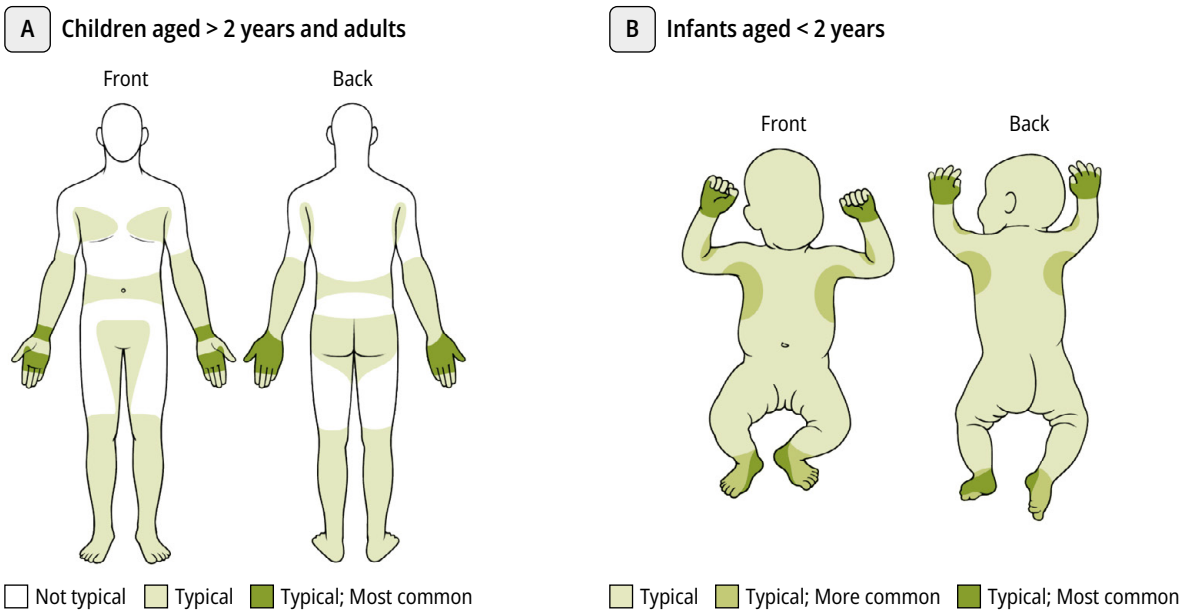
Scabies may present with one or more of three types of skin lesions: papules, nodules and burrows (*12*,*24*).

- *Papules*: Scabies commonly presents with small, easily palpable lumps on the skin (papules) measuring < 5 mm. Lesions are frequently excoriated by scratching.
- *Nodules*: In some cases, scabies may present as larger (5–10 mm) palpable lumps (nodules), especially in the genital region, axilla and breast area.
- *Burrows*: They are short (generally < 5 mm) linear lesions created by tunnelling female mites, which lay their eggs in the stratum corneum. Burrows are highly specific (pathognomonic) findings of scabies but are difficult to locate and often not present in highly endemic settings where repeated infestation and secondary infection are common.

Typical distribution of scabies lesions

The typical distribution of scabies in older children and adults includes lesions on skin distal to the mid-upper arm and mid-upper thigh and in the groin, breast and peri-umbilical areas. Lesions are most common on the hands, particularly the fingers and, finger web spaces, and wrists. In infants, lesions are typically more widespread, including the trunk, scalp, palms and soles (Fig. 3) (*12*,*24*).

Fig. 3. Typical distribution of scabies lesions



Source: *The 2020 International Alliance for the Control of Scabies consensus criteria for the control of scabies* (24).

2.2.1 Differential diagnoses

The diagnosis of clinical or suspected scabies requires that conditions other than scabies are considered less likely. Given the nonspecific nature of the pruritus and cutaneous manifestations of scabies, the diagnosis may be confused with multiple diseases. The differential diagnosis includes common infectious dermatoses, such as impetigo and viral exanthems, and inflammatory ones, such as atopic dermatitis, dyshidrotic eczema and contact dermatitis. Less common diseases, such as bullous pemphigoid or parasitic delirium, may also have similar manifestations. The ability to recognize these conditions will depend on the expertise of the examiner, although dermoscopy may also be useful (24). Annex 1 shows different images of scabies and other diagnoses.

2.3 Treatment

The mainstay of management of scabies is treatment of the index case with an effective, safe and well tolerated scabicidal treatment (topical or oral) along with simultaneous treatment of close contacts even if they are asymptomatic. If untreated, asymptomatic individuals may serve as a source of reinfestation for others.

Various treatments are available for managing scabies, each with different levels of efficacy, safety and acceptability profiles. The choice of treatment depends on the type of scabies and the patient's profile. Medications for scabies can be administered either orally or topically (25). The infestation is considered resolved if no signs of active scabies are present 4 weeks after completing treatment (26,27).

2.3.1 Management of classic scabies

2.3.1.1 Permethrin

Permethrin 5% cream is the first-line topical treatment for scabies and is preferred over other topical treatments (25). When applied as directed, it is approximately 90% effective after a single application. However, in practice, two applications are often prescribed: the first to target mites and the second, applied 7–14 days later, to eliminate newly hatched mites,

as the initial application may not destroy all the eggs (25). Two applications 7–14 days apart are recommended to ensure complete eradication, particularly in atypical scabies. For crusted or hyperkeratotic scabies, multiple treatments may be necessary.

Administration

Permethrin 5% cream should be applied over the entire body from the scalp to the toes in children aged under 1 year, avoiding the periorbital and perioral areas (25), and from the neck down in all others. Special attention should be paid to skin folds and the spaces between the fingers and toes. If necessary, a soft brush should be used to apply the cream under the fingernails and toenails. The cream should remain on the skin for 8–14 hours before being thoroughly washed off. The application should be repeated if it is washed off within 2 hours (particularly in breastfeeding mothers or on the hands). A second application is recommended after 7–14 days.

Safety profile

Permethrin has a low rate of side-effects, which are generally mild and limited to local cutaneous reactions, such as burning, stinging or itching immediately following the application. It is safe for use during pregnancy, lactation, and in children aged two months and older (25).

2.3.1.2 Ivermectin

Ivermectin, taken orally, is one of the safest and most effective treatments for scabies. Due to its potential lack of ovicidal effect, the standard regimen consists of an initial oral dose of 200 µg/kg of body weight (taken with or without food) followed by a second dose 7–14 days later. This two-dose treatment has a cure rate close to 100%, comparable to topical 5% permethrin (28,29).

Ivermectin has proven to be highly effective in mass treatment campaigns for both endemic and epidemic scabies and is often cheaper and easier to administer during large outbreaks than topical therapies (30,31) (see Section 3.3.2). Height sticks may be used to dose ivermectin during MDA.

Safety profile

Most ivermectin-related side-effects are mild and transient. These may include nausea, vomiting, dizziness, asthenia, paraesthesia, hypotension, fever, chills, anorexia, rash, pruritus, oedema, dyspnoea, abdominal pain, gastrointestinal upset, myalgia and arthralgia (25).

Ivermectin is not approved for pregnant women, lactating women within 7 days postpartum, young children aged under 5 years or weighing less than 15 kg, individuals shorter than 90 cm, severely ill patients, or people taking warfarin and some other medications.

2.3.1.3 Sulfur

Sulfur ointment (5–10%) is an effective topical treatment for scabies when applied for 3 consecutive days, and repeated after 7–14 days. Despite its unpleasant odour, messiness and potential for skin irritation, sulfur is effective and considered safe and well-tolerated, particularly for pregnant women and infants (25).

2.3.1.4 Benzyl benzoate

Benzyl benzoate, an ester of benzyl alcohol and benzoic acid, is a very effective anti-scabietic treatment with cure rates similar to permethrin. In adults, the 25% lotion is applied once daily at night for 2–3 consecutive days, with a repeat application after 7 days. For infants and children, benzyl benzoate should be diluted to 6.25% and 12.5%, respectively, due to its side-effects, such as skin irritation and burning sensation. It is not recommended for infants aged under 6 months (25).

2.3.1.5 Other drugs

In addition to common treatments, there are other options for scabies, each with its own advantages and limitations. **Lindane** is an effective scabicide but is no longer recommended due to safety concerns. **Crotamiton** cream 10%, while favoured for infants and children due to its low toxicity, requires multiple applications for efficacy. **Malathion** lotion 0.5% has limited evidence supporting its effectiveness, and its safety in pregnancy is unproven. Other drugs, such as moxidectin and fluazuron, are under study but have not yet been approved for the treatment of scabies in humans. Oral **moxidectin** has a longer half-life and, therefore, may provide longer-lasting protection and requires only a single dose, unlike ivermectin. The optimal dose for scabies is not yet known and clinical trials for scabies have not yet been completed. **Fluazuron** inhibits the development of larvae but has no efficacy against adult mites (*25*). In 2021, **Spinosad** 0.9%, a drug used to treat head lice, was approved by the United States Food & Drug Administration as a topical treatment for scabies (*32*), but it has not yet been approved in other countries.

Treatments for scabies are summarized in Table 2.

Table 2. Scabies treatments

Drug	Dosage	Recommended for	Side-effects
5% permethrin cream	60–70 mL for adults and 30–40 mL for children (two applications)	Adults, children aged > 2 months, and pregnant and lactating women	Allergic contact dermatitis and rarely irritation
Oral ivermectin	200 µg/kg	Excludes pregnant women, lactating women, and children aged < 2 years or body weight < 15 kg	Nausea, dizziness, asthenia, paraesthesia, hypotension, fever, chills, rash, pruritus, oedema, dyspnoea, gastrointestinal upset, myalgia and arthralgia
25% benzyl benzoate lotion	One bottle of 100 mL is enough for 3 days	Adults and children aged > 6 years	Irritation, allergic dermatitis and rarely neurotoxicity
5–10% sulfur ointment	One tube of 50 g at 5–10% is used for children aged < 10 years; for people aged > 10 years, two tubes of 50 g at 5–10% are needed.	Adults, children, pregnant and lactating women	Messy, malodorous, skin irritation and allergic contact dermatitis

2.3.2 Management of crusted scabies

Crusted scabies requires a combination of oral and topical treatments to reduce the high mite burden and penetrate thick scales. According to expert opinion, the first-line treatment is oral ivermectin (200 µg/kg as a single dose, given on days 1, 2, 8, 9 and 15) combined with daily topical 5% permethrin or benzyl benzoate for 7 days, followed by weekly applications until cured (*25*). Additionally, experts recommend systemic support and topical keratolytic treatment.

2.3.3 Management of secondary bacterial skin infections

Scabies may cause secondary bacterial skin infections, which in severe cases require systemic antibiotics. In children with moderate, severe or refractory infections to topical agents, empirical antibiotic therapy may be used, guided by local resistance patterns, with special emphasis on methicillin-resistant *Staphylococcus aureus* (MRSA) in endemic communities (*25*).

2.3.4 Treatment failure

Treatment failure should only be diagnosed at least 6 weeks after treatment has been completed, as hypersensitivity reactions can take time to resolve. Post-treatment itching may persist for 1–4 weeks (*25*). If symptoms persist, intensify or new lesions appear within 3–4 weeks after treatment, it may indicate treatment failure. Common reasons for failure include:

1. Incomplete application to the skin surface to be covered by the scabicidal preparation.
2. Incomplete use of the established regimen, with fewer than the recommended number of applications of the scabicide.
3. Insufficient contact time with the scabicide, due to partial washings, such as hand or nappy area, or washing of the entire skin earlier than recommended.
4. Maintaining contact with untreated individuals.
5. Failure to identify and treat close contacts.
6. Poor environmental cleanliness, especially in cases of crusted scabies.
7. Resistance of mites to scabicide.

3. Strategy for the control of scabies

Over the past few decades, various strategies for the control of scabies have been implemented and evaluated in different countries, with promising results (33–44). One of the main strategies is MDA, which has been extensively studied and shown to significantly reduce scabies prevalence in high-burden communities (12). Early research conducted in Panama in the 1970s and 1980s showed that treating entire communities with topical agents significantly reduced scabies prevalence and associated complications such as impetigo (36,45). More recent studies in the Solomon Islands and Fiji (42–44,46,47) have validated the use of MDA with oral ivermectin as a powerful tool for scabies control, achieving reductions of over 90% in some populations. These studies highlight the importance of large-scale, community-wide interventions, particularly in endemic regions. However, not all studies of MDA for scabies have had the same impressive results, such as those observed in Australia and the United Republic of Tanzania (35,37). These studies on MDA are summarized in Annex 2.

Another control strategy – intensified disease management (IDM) – focuses on identifying and treating individual cases and their close contacts. While IDM is less documented than MDA, it is a viable option, particularly in areas with lower scabies prevalence or where logistical challenges make MDA difficult to implement. In Fiji Islands, a study comparing two-dose ivermectin-based MDA, one-dose MDA, and screen-and-treat (SAT) with topical permethrin in individuals with scabies and their household contacts demonstrated that all three approaches significantly reduced scabies prevalence after 12 months (48). Additionally, in rural Malawi, a case-contact treatment programme saw limited reductions in scabies prevalence during the initial rounds of intervention, likely due to low population coverage and untreated neighbouring communities acting as reservoirs (49). These findings suggest that while IDM can be effective in certain contexts, its outcomes may vary depending on the setting and implementation.

3.1 Criteria for implementation of a scabies control programme

The first step in developing a scabies control programme is mapping to assess the disease situation and determine if and where control strategies are required. The aim is to guide decision-making on the appropriate control strategy, such as MDA or IDM, based on the scabies burden in the community (50).

Though the burden of scabies has been estimated in some countries, significant gaps remain in understanding its global distribution and its contribution to other health conditions like impetigo, skin and soft-tissue infections, glomerulonephritis and, potentially, rheumatic heart disease (12,40). It is essential to map the burden of the disease to identify whether scabies poses a public health problem and, if so, which control measures are necessary.

The disease burden should be measured as the prevalence of scabies at the community level or within specific target populations, such as school-aged children. This helps identify areas exceeding the thresholds for implementing different control strategies. As explained in Section 3.3.1, mapping the disease burden is part of the planning and pre-campaign phase of a scabies control strategy.

3.1.1 Mapping the burden of the disease

Two methods are recommended for estimating disease prevalence (50):

- **rapid mapping** to generate approximate estimates of disease burden and identify areas that should be considered for mass treatment strategies; and
- **prevalence surveys** to refine the estimates, confirm conclusions reached by rapid mapping and identify sites for longitudinal impact assessment.

3.1.1.1 Rapid mapping

Rapid mapping is a simplified method to determine whether scabies is a public health problem and whether control strategies are needed. This approach is based on a simplified version of the 2020 IACS criteria (24) to estimate the

disease burden and help identify whether intervention is required (12). The simplified skin examination includes typical scabies lesions in a typical distribution with either itch or a positive contact history, where contact history is automatically considered positive if the person is living in a highly endemic region (i.e. prevalence > 10%) (see Section 2.2). Rapid mapping and sampling strategies are essential for identifying communities where a public health action is required (50).

3.1.1.1.1 Identifying locations for mapping

A preliminary review is required to identify areas suspected of having a high prevalence of scabies and where rapid mapping might be warranted (12).

This could involve:

- a desk review of:
  - any routinely collected health data,
  - any previous prevalence surveys in the country and
  - any published or unpublished articles, case reports or case series; and
- discussions with front-line clinical and managerial health staff to identify geographical areas of concern (e.g. unconfirmed reports of scabies or other skin diseases).

3.1.1.1.2 Strategy for rapid mapping

The aim of rapid mapping is to find areas of high prevalence as a basis for public health decisions about scabies control strategies (12).

Diagnosis

Skin assessment should be performed by nurses or healthcare workers who have completed a training programme. This brief training in rapid mapping should continue to be refined and validated (52) and include consideration of other diseases with similar presentations to scabies. This model is similar to that adopted by the global trachoma control programme, which also relies on clinical diagnosis performed by healthcare workers who have undergone standardized training.

For diagnosing scabies during rapid mapping, a modification of the IACS 2020 criteria (24) (see Section 2.2) is recommended. Diagnosis is based on the identification of typical lesions and the distribution of scabies, with or without itch. The examination of the arms (above the elbow to the fingertips) and legs (above the knee to the toes) is sufficient for rapid mapping; the examination of abdominal or genital areas is not necessary for this purpose (51). The contact history required in the 2020 IACS criteria could be difficult to achieve during rapid mapping and possibly poorly reproducible; therefore, it is not recommended.

The modified criteria for the diagnosis of scabies should be used only for rapid mapping of the burden of scabies and should not be used to decide on individual management.

Scabies complications

Collecting information on **impetigo** during rapid mapping for scabies may be useful in assessing the likely overall impact of a scabies control programme. Although the prevalence of impetigo does not affect the decision to implement MDA, little additional time is needed to assess it. However, standardized criteria for the diagnosis of impetigo are needed. On the other hand, it is not feasible to routinely collect information on other more severe complications, such as severe infections, glomerulonephritis, or rheumatic fever, during rapid mapping (12).

Crusted scabies are important in assessing the success of scabies control, but they do not need to be accurately quantified during mapping. Any cases of suspected crusted scabies found should be reported for appropriate specialist assessment (12).

3.1.1.1.3 Target population and sampling strategy

Mapping strategies must achieve a balance between accuracy, detailed epidemiological information and logistical challenges, including time, travel and cost. Sampling methods used in other NTD programmes for MDA should be adapted for scabies mapping. Additionally, integrating scabies mapping with other NTD mapping programmes can optimize resources and improve efficiency (*12*).

A population of approximately 100 000–150 000 would be an appropriate **implementation unit** (**IU**) for both mapping and interventions. A smaller or larger population might be used in some settings, such as islands and urban areas (*12*).

Sampling strategies

Community-based house-to-house surveys are the recommended and preferred method for accurately assessing scabies prevalence. These surveys provide comprehensive data by including all population groups. If a desk review suggests a high prevalence, community surveys are especially important for confirming findings. The survey should be designed to allow estimates of prevalence by age, gender and village, and to determine whether the prevalence exceeds the threshold for starting MDA (*12*).

School surveys, while easier to implement and useful for estimating scabies burden among individuals at very high-risk of transmission, may exclude non-attending children who might be at higher risk. The degree of clustering of cases in schools could also increase the sample size required. School surveys are a reasonable alternative only if community surveys are not feasible and school attendance is high (*12*). Programme managers should evaluate factors like school absenteeism rates and existing prevalence data when selecting this method.

Central point examinations are conducted in settings where house-to-house surveys are logistically challenging; conducting surveys at a central point may be more practical, but this should be adapted to the local context (*12*).

In summary, while community surveys are a more robust strategy, they are also more logistically challenging in terms of travel, time and cost. In contrast, school surveys may be easier to implement but less comprehensive. Central point examinations can serve as an alternative in challenging logistical settings. Despite these considerations, community-based surveys should remain the preferred approach for mapping scabies prevalence.

These recommendations address mainly rural and remote populations, as there is currently insufficient data and experience to make recommendations for urban areas.

Box 3 shows the rapid assessment methodology based on a process used for trachoma monitoring and evaluation (*53*).

Box 3. Rapid assessment process methodology

During rapid assessment, programme managers and implementation partners **review existing information on scabies** in regions of interest via routine administrative reports from health services, discussion with key informants, and undertake direct observations through fieldwork to collect limited prevalence data.

Rapid assessment uses convenience sampling and should **focus on communities within the evaluation unit** (**EU**) that are considered likely to have a **prevalence above the 10% threshold**.

Communities for rapid assessment field work should be prioritized if one or more of the following criteria are met:

- Suspicion of scabies endemicity based on a previous review, or analogy with areas that have direct evidence and comparable sociodemographic, environmental and other relevant characteristics.
- Evidence of scabies from previous clinic reports or key informants.
- Poor access to primary healthcare.

Attention may need to be given particularly to sub-populations defined by ethnicity or other characteristics, such as isolated communities, minorities and other marginalized, mobile or migrant population groups or tribes.

According to the **protocol** for trachoma (*53*):

- Some 3–7 communities per EU should be selected, targeting 50 residents per community. Within each EU, this equates to the examination of 150–350 individuals. More communities can be selected if the initial survey does not provide adequate information to inform decision-making.
- Information on the selected communities should be gathered, including population size, housing conditions and available healthcare facilities.
- Within each community, 10–15 households (to enable examination of 50 residents) should be selected in areas with evidence of poor housing or overcrowding and, in liaison with the local community leader, should be examined for clinical evidence of scabies.

Diagnosis

- Simplified 2020 IACS criteria (*24*): identification of typical lesions and distribution of scabies, with or without pruritus. Examination of arms and legs is sufficient without additional visualisation techniques or skin scrapings.
- It is not necessary to measure impetigo during the rapid assessment.
- Skin assessment should be performed by nurses or healthcare workers who have completed a training programme.

The proportion of individuals diagnosed with scabies among those examined is then calculated to give an estimate of the prevalence in the EU, and this is used to indicate if further assessment is required.

Source: *Monitoring and evaluation plan for mass drug administration programs for scabies* (*50*).

3.1.1.2 Prevalence survey

Prevalence, as opposed to rapid mapping, should be estimated in areas of concern or in areas that are programmed to be followed longitudinally as sentinel sites (see Section 4).

In general, estimated prevalence can be used to:

- provide epidemiological data on the burden of scabies and impetigo;
- monitor the impact of interventions, by repeating prevalence surveys at sentinel sites; and
- identify new ways to predict areas with suspected high-level prevalence from other easily identified characteristics.

A **baseline prevalence survey** can be conducted prior to MDA to (i) more accurately determine the prevalence of scabies and impetigo, (ii) determine the appropriate control strategies (e.g. MDA or IDM), and (iii) provide a baseline to monitor the impact of control strategies.

A baseline prevalence survey could be omitted if a programme manager and stakeholders determine that the rapid assessment has provided enough information for decision-making regarding scabies control strategies.

Prevalence, as opposed to rapid mapping, should be estimated by the most accurate diagnostic method feasible in each setting (*12*,*24*).

The **prevalence of impetigo** should be assessed on skin examination at the same time as the prevalence of scabies (*12*), accepting that a limited examination may not detect all cases of impetigo Collecting information on more severe complications would not be feasible or practical (*12*).

Surveys should be designed to determine age- and gender-specific community prevalence, with an appropriate sampling method in large communities and census evaluations in small communities (*12*).

3.1.1.2.1 Sampling strategy for baseline prevalence survey

As it is not practical to examine the entire EU population for scabies, a **survey should be conducted on a sample of the population**, with a sample size sufficient to provide an accurate estimate of the prevalence in the overall EU population.

The recommended approach is a **two-stage random cluster-sampled survey** (*50*):

- **First-sampling-stage clusters** are a selection of villages, informal settlements or the local equivalent.
- **Second-sampling-stage clusters** are a selection of households.

First-stage clusters refer to populations comprising 100–300 individuals living in the same geographical location, whether villages (rural settings), informal settlements or urban settings.

The **number of individuals to be examined in each EU** is calculated using the following formula (*50*):

$$\textit{Sample size required} = \frac{e \times d^2 \times b \times (1-b)}{c^2}$$

where

a. planned cluster size (usually 100–300 individuals)

b. expected prevalence of scabies in the EU

c. absolute precision required (recommend ± 20% of the point prevalence estimate)

d. alpha risk (risk of true prevalence being outside confidence interval) expressed as z score (recommend 1.96)

e. expected design effect to take account of clustering (recommend design effect of 2)

The sample size should then be divided by a, the planned cluster size (usually 100–300 individuals) in order to calculate the number of clusters required. For example, a sample size of 2000 would require 20 clusters of 100 individuals per cluster.

Within each EU, a list of all villages and lower urban administrative units should be obtained, together with their population sizes. From this list, the first-stage clusters should be randomly selected using a probability proportional to the population size of each village or lower urban administrative unit. This provides an equal opportunity for individuals to be surveyed, irrespective of the size of the cluster they live in.

If possible, a list of households should be obtained for second-stage clusters, and the required number of households should be selected randomly from the list. For example, if an examination of 200 individuals is planned for each cluster, this would mean visiting approximately 40 households in each cluster, based on an assumption of 5 individuals per household. If a list of households is not available, systematic sampling can be used by mapping the village and numbering the houses. Survey teams should then conduct surveys at these selected households until at least the required number of individuals have been surveyed.

Within each household, all residents should be invited to participate and give informed consent. Children aged < 18 years should be invited to participate with the informed consent of their parent or guardian. Information should be recorded on:

- Demographic characteristics – name, age (or date of birth), sex
- Results of clinical assessment – history and skin examination features as per diagnostic criteria are summarized in Box 1 for scabies and in Annex 3 for impetigo.

Following the survey, EUs should be categorized according to scabies prevalence (calculated as the proportion of those examined and found to have scabies) as:

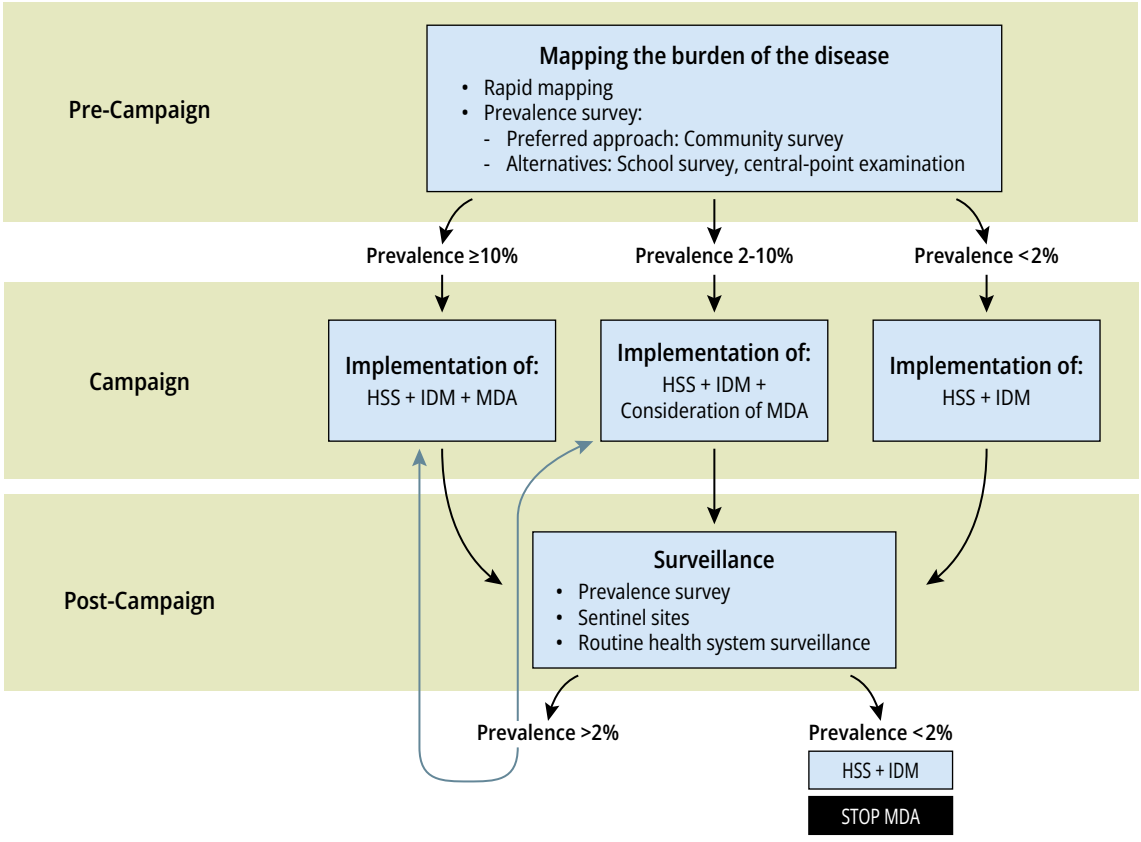
- **hyperendemic**: ≥ 10%
- **mesoendemic**: 2–9%
- **hypoendemic**: < 2%
- **uncertain**: scabies prevalence is undetermined and further surveys are required.

3.2 Implementation phases

Once the need for action and implementation of a scabies control campaign in a community has been identified, a communication, multisectoral coordination and response strategy to contain the spread of the disease must be developed.

The ultimate control strategy should be informed by the prevalence surveys conducted and broader health system considerations. The overall treatment campaign implementation procedure is developed in three phases: pre-campaign, campaign, and post-campaign (Fig. 4).

Fig. 4. Phases in the implementation of a scabies control strategy



HSS: health systems strengthening; IDM: intensified disease management; MDA: mass drug administration.

As shown in Fig. 4, health system strengthening (HSS) and IDM should be undertaken in all contexts. In settings where the prevalence is > 10%, MDA should be performed as well. For prevalence between 2% and 10%, the decision about utilizing only HSS and IDM or conducting MDA depends on local considerations (*12*) . For example, focal MDA could be conducted, or MDA could be integrated with other NTD control activities. If the prevalence is < 2 %, only HSS and IDM should be conducted.

3.2.1 Health system strengthening and intensified disease management

HSS can be defined as activities, policies and strategies designed to enhance the performance of a health system and improve health outcomes. WHO identifies six core building blocks of HSS (Box 4), which are all interconnected and work together to create sustainable and equitable improvements to health services across a country (*54*).

Box 4. Core building blocks of HSS

- Health service delivery
- Health workforce
- Health information systems and surveillance
- Access to essential medicines
- Health financing
- Leadership and governance.

HSS is a critical component of scabies control programmes, driving systemic change to ensure that all levels of the health system work cohesively to reduce the burden of scabies. HSS activities, both during and following a successful MDA, contribute to a sustained reduction in prevalence by ensuring the availability of treatments and facilitating timely responses to outbreaks. By strengthening health systems, HSS activities can enhance scabies control efforts through the development of robust, equitable and high-quality health services.

All six HSS building blocks should be considered when designing a scabies control programme, particularly during and after an MDA, to sustain the gains achieved and maintain low prevalence (*55*).

IDM has a significant overlap with activities of HSS and mainly focusses on the health service delivery building block. IDM and HSS should be delivered as an integrated approach rather than in isolation.

Box 5 summarizes the key elements of an IDM strategy.

Box 5. Key elements of an IDM strategy

- Enhance clinical care in primary healthcare clinics by providing evidence-based guidelines on optimal treatment (ivermectin and/or permethrin) of clinical cases and all household contacts.
- Raise awareness of scabies as a clinical and public health problem among both healthcare workers and the public.
- Train healthcare workers in the recognition and diagnosis of scabies and in the treatment of individuals, households and other close contacts.
- Recognize and refer cases of suspected crusted scabies with treatment guidelines that include recommendations for follow-up and environmental measures.
- Strengthen and support routine collection, analysis and reporting of data on scabies presentations at healthcare facilities.
- In appropriate settings, consider active case-finding with referral or treatment, such as screening for skin-related NTDs (skin NTDs), with an opportunity to include scabies.

3.2.1.1 Health service delivery

Health service delivery refers to the provision of high-quality, safe, competent health services to individuals and communities in need, regardless of location or social demographics. This includes infrastructure, resource management, logistics and waste minimization (*56*). In the context of scabies control, health service delivery should consider:

- Standard treatment guidelines and protocols for diagnosis, management and treatment of scabies, which should be reviewed and updated as necessary.
- The appropriate level of health facilities needed to manage and treat scabies needs to be determined. Where possible, this should prioritize primary care to maximize the community reach and ensure accessibility to services.
- An assessment to gain an understanding of when and how community members seek treatment for scabies, and which strategies should be developed to address and reduce the barriers to accessing care (which may include community awareness or health education campaigns).

3.2.1.2 Health workforce

The health workforce relates to the staffing of the health system, highlighting the need for adequate numbers of staff who are appropriately distributed according to need, retention strategies, and the necessary training and knowledge to complete their duties effectively. HSS activities should include:

- Identifying the staff and departments whose role can include aspects on the control of scabies. This may include staff at NTD units, disease control departments or dermatology clinics.
- Assessing the current level of scabies knowledge among health professionals to determine the training requirements. Based on this assessment, a training package for scabies control can be developed including information on diagnosis, complications and available treatments.
- Whenever possible, integrating scabies training with training on other diseases, services or NTD programmes. In the context of an MDA, incorporating further training on scabies can enhance knowledge and save on resources and logistics.
- Ideally, training should be offered across the entire health system. However, this should be adapted based on the need. Training for health staff who have direct access to the community at a grassroots level such as village health volunteers and community health workers should be priorities due the reach into the community to promote health-seeking behaviour, address the complications of scabies and ability to breakdown stigma.
- Developing or revising reference documents or guidelines to support with scabies diagnosis and treatment.

3.2.1.3 Health information systems and surveillance

Health information systems and surveillance refers to the processes and methods used to collect, disseminate and analyse health data. The data are used to assess the health systems' performance and communities' health status, supporting decision-making and policy development (*56*). Health information systems and surveillance in relation to scabies should consider:

- Strengthening health information systems and surveillance to include routine collection, analysis and reporting of data on scabies presentations. Ideally, data should capture information on people of all ages.
- Making crusted scabies a notifiable disease to ensure appropriate specialist assessment, follow-up for environmental measures, and treatment of the patient and close contacts. This may include developing procedures to recognize and refer cases of suspected crusted scabies.
- Determining the role of prevalence surveys post-MDA and how surveys can be utilized to periodically monitor country-wide prevalence, especially post-MDA, and to measure for hotspots/clusters.
- Implementing community-based reporting through health care providers who live in the community, such as community health workers or village health volunteers.

3.2.1.4 Access to essential medicines

Access to essential medicines refers to the availability and accessibility of medical supplies required for a functioning health system. This includes equitable access to medications that are cost-effective, meet quality and safety standards, and are distributed where needed (*57*). HSS activities to consider relating to scabies control include:

- Ivermectin should be considered as the most appropriate first-line treatment for scabies. Countries should be supported to include ivermectin on the National Essential Medicines List. Ivermectin is an effective and cost-comparable alternative to topical agents in the treatment of scabies, with the added benefit of easy logistics as it is easier to transport and distribute than creams. Ivermectin should be available at all levels of the health systems to ensure greater community access and remove barriers to access, such as transportation.
- It is vital that permethrin cream or an alternative is still readily available despite the introduction of ivermectin. Ivermectin is not recommended for pregnant women, lactating women within 7 days postpartum, young children aged under 5 years of age or weighing less than 15 kg, individuals shorter than 90 cm, or severely ill patients, so permethrin cream will be required for these groups (*12*).
- Maintain adequate supply chains to avoid stock outs. Stock outs of scabies medicines jeopardize the gains made by successful MDAs. The availability of treatments for scabies will be essential to any aspect of HSS as it is the one key element for scabies control.
- Where required, provide technical advice on procurement, supply, storage and distribution systems, including cost and quantification estimates.
- Training and communication for health professionals will be required to ensure awareness of the available treatment options.

3.2.1.5 Healthcare financing

Healthcare financing relates to raising and allocating funds to support the work of the health system, including meeting the needs of the community while not risking financial hardship for those seeking services. Sufficient health financing will be vital to lowering the burden of scabies and the success of the HSS activities (*58*). Below are the aspects to consider.

- Determine if funding for scabies control is sufficient. Consider the various needs such as training health professionals, medical treatments, community awareness or engagement, health information and surveillance and costs associated with MDAs. If the scabies intervention programme relies on external donors, it is important to determine the duration of the funding and develop a long-term sustainable financial strategy for continuity of service.
- Integrating with other NTDs to deliver services can be an efficient cost-saving measure. Integration approaches should be reviewed to assess where integration is possible with other NTDs or wider health services.
- Define what the ongoing funding needs are, especially post-MDA, including medicine and staffing needs relating to scabies control. Asses if there is adequate funding for the procurement of scabies medicines and the potential impact of costs associated to the patient and the risks of not seeking treatment due to fees.

3.2.1.6 Leadership and governance

Leadership and governance refers to policy frameworks, coalition-building, motivation, accountability and regulation for effective healthcare leadership (*54*). Consider:

- Define where and who has the responsibility for scabies control and for what aspects. The roles and responsibilities of each health department and provider should be defined, including how an NTD Unit could work in conjunction with a dermatology department if these services are available.
- Consider the structure of the health system regarding scabies control to ensure it is integrated with other aspects of the health system and not isolated in a silo. This could include the establishment of an NTD Unit and task force and the development or reviewing of an NTD action plan that includes scabies.
- Identify a number of scabies champions who can lead and advocate for scabies management throughout the health system.

3.2.2 Mass drug administration

3.2.2.1 Phase 1: pre-MDA

These are the bases for effective response operation planning and implementation. The core functions to be addressed in this phase are determining the burden of scabies, ensuring the availability of treatment supplies and coordinating.

3.2.2.1.1 Baseline data

The burden of the disease is crucial to commence a rapid and proportionate response and identify which areas exceed the thresholds for implementing different control strategies. As discussed in Section 3.1 above, estimates of prevalence for determining where to start the chosen control strategy could be derived by rapid mapping, although a formal prevalence assessment could also be used.

Threshold for initiating MDA

The effectiveness of **MDA** has been best demonstrated in settings where the community **prevalence of scabies infestation was ≥ 10%** and on islands. Many studies on which this evidence is based were conducted in island populations, and the results may or may not be generalizable to the mainland or urban areas (*12*). If school mapping is used, a higher prevalence threshold would be required than for community MDA, which should be verified in additional operational research (*12*).

In areas with a prevalence < 10%, utilizing only HSS and IDM or conducting MDA or other strategies depends on local considerations (see Fig. 4) (*12*).

When the estimated prevalence is < 2% at baseline, only HSS and IDM rather than MDA should be used.

Target threshold for stopping MDA

A target close to the initial threshold of 10% would be inappropriate, as prevalence would rapidly increase to pre-MDA levels (Box 6). Trials of MDA with ivermectin in high-prevalence settings have shown that prevalence can be reduced to around 2% with a single round (although the efficacy of each round of MDA may be lower in settings other than islands). Therefore, a **threshold of approximately 2% for stopping MDA** is recommended, as above that level, slow rises in prevalence were seen in trials on islands (*43*,*47*). With the currently available tools, achieving a 2% threshold may be unrealistic in large populations and in non-trial settings. Hence, in areas with a 2–9% prevalence following MDA, the decision on whether to stop or undertake further should be based on local factors. A community-based prevalence survey should be used to measure prevalence after MDA and guide these decisions.

Box 6. MDA thresholds

Scabies prevalence ≥ 10%: MDA should be implemented until the prevalence falls to the target of approximately 2%.

Scabies prevalence 2–9%: MDA could be considered depending on local considerations (for example, focal MDA or integrations of MDA with other NTD control activities).

3.2.2.1.2 Coordination

Effective **multisectoral coordination** is essential to ensure the success of scabies treatment efforts, rather than relying on individual sectors working independently. Coordination must occur across all levels – national, regional and local – to efficiently manage resources, share information and address gaps in the scabies response. Collaboration between different sectors allows scabies control programmes to optimize resources, achieve higher treatment coverage and more effectively control the spread of scabies in affected regions.

3.2.2.1.3 Planning

Effective planning at each level – regional, zonal and local – is critical for the success of a scabies control campaign.

At the **regional level**, the focus should be on estimating and securing a realistic budget and logistics, driven by accurate data. Key elements include high-level political commitment, forming intersectoral sub-committees (e.g. for planning, logistics, social mobilization), mobilizing resources, and developing a detailed plan of action that outlines the target population, area and timelines. It is also important to adapt training materials, conduct micro-planning workshops, organize local training, and ensure procurement and distribution of drugs and supplies.

At the **zonal level**, planning is supported by national and regional levels and focuses more on operational details. This includes preparing census data, establishing coordinating committees, intensifying social mobilization and designing strategies for hard-to-reach populations. Logistics and drug distribution plans must be finalized, and daily meetings with supervisors and coordinators should be held to review the quality of the strategy implementation.

Micro-planning is a bottom-up approach that starts at the district or local level and involves all stakeholders. It incorporates data on the population, cases by age and sex, available health workers, stock levels and hard-to-reach areas. The process includes mapping drug distribution points, high-risk populations and local stakeholders. The collected data will help determine the campaign's logistics, including treatment supplies and the number of teams and supervisors needed.

3.2.3.2 Phase 2: MDA implementation

3.2.3.2.1 Medication choice and dosing

The medication of choice for MDA is **oral ivermectin**. In those individuals with a contraindication for ivermectin, such as pregnancy, breastfeeding or weight < 15 kg, topical treatment with 5% permethrin is recommended (*12*).

The recommended **dose of ivermectin is 200 µg/kg body weight**, and it was determined by prioritizing safety, clinical efficacy and cost (*12*). A **standardized approach to ivermectin dosing for scabies** is essential (*12*).Several dosing methods can be considered, each with advantages and limitations. Height-based dosing could be an appropriate option, as weighing people during MDA could be logistically challenging (*59*):

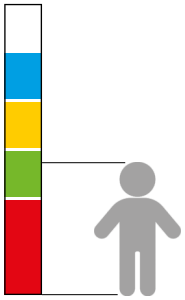
- ***Height-based dosing*** is a common strategy in MDA for NTDs. Its advantages include ease of use and straightforward conversion from measurement to dose using, for example, tools like a height stick with colour-coded segments by height. The person should stand on flat ground, feet together, looking straight ahead, with the top of their head aligned with the appropriate colour to determine the number of tablets required (as shown in Fig. 5).
  Its disadvantages include potential under-dosing for overweight adults.
- ***Age-based dosing*** has the advantage of simplicity but with several limitations, including inaccurate age reporting, variable age correlation with weight, potential under-dosing in many settings, and no studies of effectiveness.
- ***Weight-based dosing (on scales)***, as used in previous studies of scabies interventions, is appropriate for clinical use but is logistically challenging for larger-scale MDA. The advantages include less under-dosing (especially for overweight individuals), while the disadvantages include the cost of scales and the time required. In settings without access to scales, a body chart (Fig. 5) can be used to estimate the appropriate ivermectin dose. Health workers visually assess a person's body shape to determine if they are small, large or very large, and adjust the tablet dose accordingly.

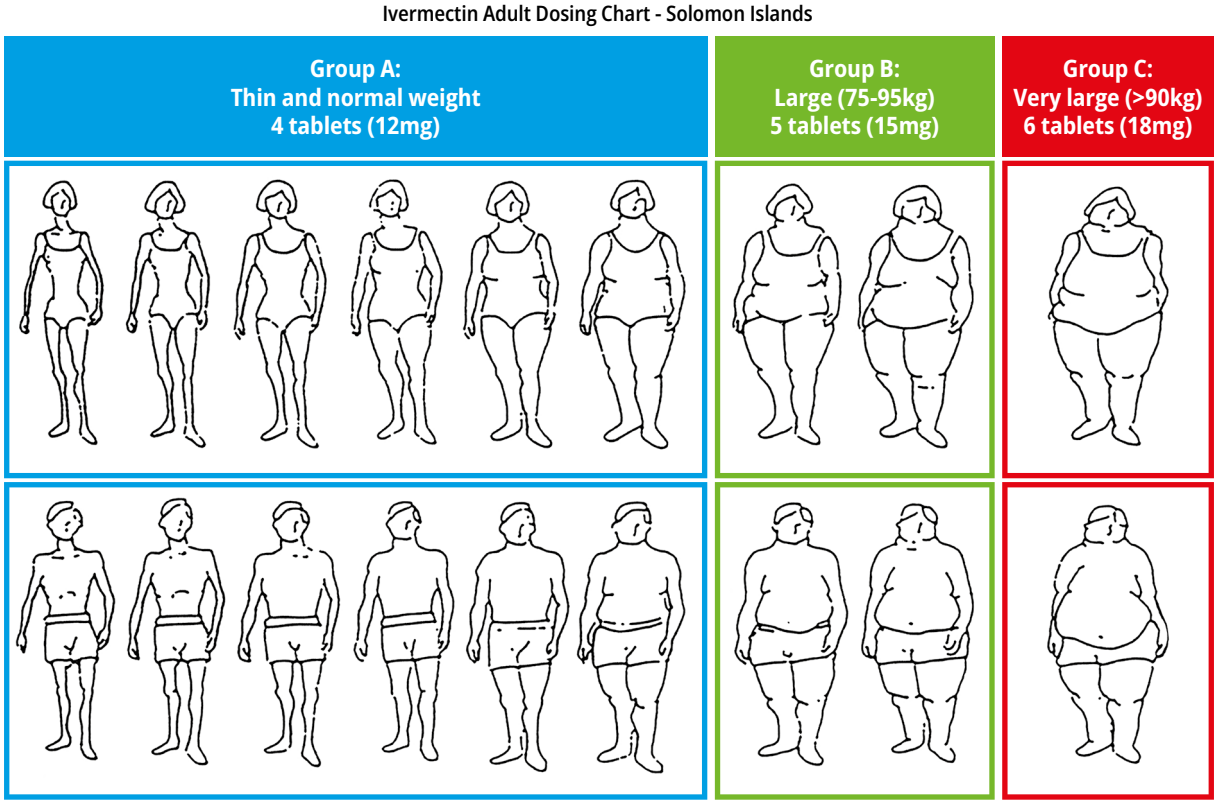
Annex 4 provides an example of a standard operating procedure (SOP) for determining ivermectin doses during MDA in the Solomon Islands. This approach combines methods based on age, height and body shape:

- aged under 2 years: use topical permethrin cream.
- aged 2–15 years: use the height stick.
- aged 15 years and older: use the body chart.

Fig. 5. Ivermectin dosing tools for MDA. Chart using a colour-coded height stick, indicating the corresponding ivermectin dose (in tablets) based on the individual's height (upper panel). Body chart for estimating ivermectin doses based on body size (lower panel)

Height stick colour	Number of ivermectin 3mg tablets
White (>156cm)	4 tablets (12mg) or more
Blue (139 to 156cm)	3 tablets (9mg)
Yellow (113 to 138cm)	2 tablets (6mg)
Green (90 to 112cm)	1 tablet (3mg)
Red (90cm below)	Permetrina cream





Source: *Standard operating procedures for dosing during MDA in the Solomon Islands* (Annex 4).

Countries should develop their own dosing strategy appropriate to their population to achieve an approximate dose 200 µg/kg.

Two doses of ivermectin at least 7 days apart may be necessary to treat the scabies infestation fully. Ivermectin is active against adult and immature mite forms but not against eggs. Permethrin is active against adult mites and has some activity against eggs (*12*). Scabies treatment recommendations are summarized in Box 7.

Box 7. Treatment recommendations (*12*)

Oral treatment with ivermectin

- MDA rounds should be based on two doses of ivermectin.
- Ivermectin dosing (two doses 7–14 days apart):
  - 200 µg/kg, rounded up to 3 mg tablets, with direct observation of ingestion
  - weight- or height-based dosing is appropriate for a target dose of 200 µg/kg; age-based dosing is not recommended.

Contraindications:

- children weighing < 15 kg or < 90 cm in height
- pregnant and lactating women, within 1 week of giving birth
- sick and infirm people
- people with previous hypersensitivity to ivermectin
- Warfarin and some other medications.

Exclusion due to pregnancy is a precaution in the absence of definitive information, as there is no direct or anecdotal evidence of complications resulting from treatment with a single dose of ivermectin in pregnant women (*35*,*37*,*43*).

Topical agents

Topical agents should be used when ivermectin is contraindicated or not available.

- For individuals aged > 2 months, **5% permethrin topical cream** is the treatment of choice. **Benzyl benzoate topical cream** or lotion is an alternative.
- For infants aged < 2 months, the options are **5% permethrin cream** but with a shorter application time (4 h), **sulphur**, **crotamiton** or no treatment.

Permethrin dosing (two doses, 7–14 days apart):

- Adults and children aged > 12 years: apply up to one 30-g tube, and wash off 8 h after application.
- Children aged 5–12 years: apply up to half a 30-g tube, and wash off 8 h after application.
- Children aged 2–5 years: apply up to one-fourth of a 30-g tube, and wash off 8 h after application.
- Children aged 6 months to 2 years: apply up to one-eighth of a 30-g tube, and wash off 8 h after application.
- There is limited data on permethrin use in infants aged < 6 months; WHO suggests that up to one-eighth of a 30-g tube could be applied and washed off 4 h after application.
- The cream should be applied over the entire body from the scalp to the toes in children aged < 1 year (avoiding the periorbital and perioral areas) and from the neck down in individuals aged > 1 year.

Benzyl benzoate 25% (4–6 doses; one daily dose 2–3 consecutive days, repeat after 7–14 days):

- Apply, and wash off 24 h after application.
- For adults and children aged > 12 years, undiluted 25% should be used.
- For children aged 2–12 years, dilute to 12.5%.
- For infants aged 6 months to 2 years, dilute to 6.25%.
- Do not use in infants < 6 months of age.

Sulfur ointment 5–10 % (6 doses; one daily dose 3 consecutive days, repeat after 7–14 days):

- Apply, and wash off 24 h after application.
- For adults, pregnant women and children aged over 1 year, undiluted 10% should be used.
- Ideally, use a lower concentration for infants aged 0–12 months.

Application of topical treatment:

- Adults and children aged 2 years and older: apply to the body surface from the neck to the toes, excluding the head.
- Infants aged < 2 years: apply to the entire body surface, including neck, face, ears and scalp, but avoid areas around the eyes and mouth.

Source:

As an example, Annex 4 shows the standard operating procedures for dosing during MDA in the Solomon Islands.

3.2.3.2.2 Environmental decontamination

Current evidence does not strongly support that environmental measures, such as decontamination for bedding, clothing and towels used by infested individuals or close contacts, provide additional benefits to MDA control programmes (*12*). However, crusted scabies could be an exception, as it involves a very high parasite burden and is highly infectious. Its management, therefore, necessitates environmental measures such as washing clothes, bed linen and towels in hot water, and cleaning floors and furniture.

3.2.3.2.3 Number and frequency of MDA rounds

The number of rounds of MDA should be defined by the geographical context of IUs, such as whether they are rural or urban, and baseline transmission characteristics; fewer rounds might be required in rural island settings than in larger urban settings (*12*).

There is limited evidence to inform the optimal number of rounds of MDA, but the current recommendation is that **MDA should be implemented annually**, and programmes should consider conducting 2–5 annual rounds, with impact assessments to determine whether it should be continued longer or discontinued as explained in Box 6 (MDA thresholds) (*12*). Impact assessments should be conducted either yearly or at the end of years 3 and/or 5, although initial operational research will require annual assessment (see Section 4).

3.2.3.2.4 Coverage targets and implementation units

High coverage is essential for an effective MDA programme (Box 8).

Box 8. Coverage

High coverage depends on:

- the availability of adequate quantities of both topical and oral medications at the right time;
- the efficiency of the drug delivery system;
- the motivation and productivity of drug distributors;
- the implication, motivation and education of the beneficiary communities; and
- the availability of surveys to identify population groups that are being missed.

The minimal target coverage for MDA is 80% of the total population (for doses of both oral and topical treatments) since the entire population is eligible for treatment with either ivermectin or topical medicine (*12*). Therefore, programmatic coverage and epidemiological coverage for scabies programmes are identical. Section 4.2.2.1 provides the details of how to calculate treatment coverage.

National governments should identify the smallest (lowest-level) administrative unit responsible for implementing MDA (district, town, city block). The larger the IU, the proportionately fewer resources would be required for initial epidemiological assessment, but more resources would be needed for MDA implementation. The population of an IU should not be > 150 000; smaller IUs could be used, as determined, in national programmes (*12*).

3.2.3.3 Phase 3: Post-MDA

Once the scabies control strategy has been implemented, it is important to assess its impact and ensure that scabies prevalence has significantly decreased. This phase involves evaluating whether the programme has achieved its goals and ensuring ongoing surveillance to maintain low prevalence levels.

According to WHO consensus recommendations (*12*), MDA should be stopped once the prevalence of scabies is reduced to below 2%. To verify this, a prevalence survey should be conducted after the final planned round of MDA to confirm that the threshold has been reached and that MDA can be ceased (*50*). If the prevalence remains below 2%, IDM and HSS should be used instead of MDA to sustain control efforts.

Ongoing surveillance is essential in this phase to monitor scabies prevalence and prevent any resurgence. Sentinel site monitoring and primary healthcare reporting will provide data on the long-term burden of scabies post-MDA (*50*).

For more detailed information, see Section 4. Supervision, monitoring and surveillance.

3.2.3 Additional considerations for the implementation of scabies strategies

Integration

Seek opportunities for integration with existing programmes, including at the stages of mapping, implementation and surveillance (*12*).

Scabies control programmes should also be integrated into school health programmes. Schoolteachers should be encouraged to regularly examine schoolchildren or carry out random checks on any child who scratches to detect potential cases of scabies.

Community engagement

Scabies control programmes should learn from and use strategies for community engagement developed for other NTD programmes and tailor them to the context (*12*).

Costs

The costs of delivering treatment, including community engagement, training, paying healthcare workers, transport, monitoring and surveillance, should be considered. While benzyl benzoate, ivermectin and permethrin are included in the WHO Model List of Essential Medicines, they are often not listed in the national essential medicines lists of individual countries. Emphasizing this gap is critical, as it poses a significant barrier to access. Identifying mechanisms to improve access to low-cost ivermectin and permethrin, such as prequalifying suppliers of generic drugs and advocating for their inclusion in national essential medicines lists, is necessary to ensure broader availability (*12*).

Identifying mechanisms to improve access to low-cost ivermectin and permethrin, such as prequalifying suppliers of generic drugs and advocating for their inclusion in national essential medicines lists, is necessary to ensure broader availability.

Estimating the cost and cost-effectiveness of MDA and IDM strategies is essential for implementation and decision-making. Although estimates of the cost of scabies MDA are unavailable, they are available for similar programmes. However, it should be noted that the requirement for topical treatment and second doses of both oral and topical treatments would result in higher costs than those for other programmes (*12*).

Safety

Ivermectin has a wide therapeutic window, which minimizes the risk of adverse events due to accidental overdosing. However, special precautions are required in countries endemic for *Loa loa*, as neurological alterations have been observed in patients infected with the parasite and treated with ivermectin. While serious reactions are rare, and most cases recover without neurological sequelae, surveillance should be strengthened, and follow-up periods extended when MDA with ivermectin is conducted in areas with high *Loa loa* prevalence. Community health workers should be trained to recognize and report symptoms such as fever and neurological changes following ivermectin treatment and must have the means to communicate rapidly with programme managers and health facilities. Close supervision is especially critical after the first round of treatment, when adverse events are most likely to occur (*60*).

There is also extensive experience with use of **topical treatments** for scabies.

Drug safety monitoring in scabies programmes should be based on that in other NTD programmes and should use existing frameworks for monitoring and reporting adverse events, such as VigiBase (https://www.who-umc.org/vigibase/vigibase/) (*12*).

Human resources and training

In the absence of trained specialists, training material and evaluations should be designed for front-line and mid-level healthcare workers. The 2020 IACS criteria (*24*) should form the basis of any training package, and staff should also be trained to recognize impetigo (*12*).

Standard training material should be developed that can be adapted locally to include different skin types and exposure, as appropriate (Box 9).

Box 9. Training packages

Development of **training packages** should include (*12*):

- evaluation of the reproducibility and reliability of the IACS diagnostic criteria in various settings;
- standardization of staff evaluations;
- determination of whether formal assessment of inter- and intra-operator agreement is required; and
- determination of how to establish post-training re-evaluation.

4. Supervision, monitoring and surveillance

4.1 Monitoring and evaluation

Continuous surveillance at the community level is essential for early detection, prevention and control of scabies. Monitoring and evaluation (M&E) are critical components of the scabies control strategy, as they document the impact of interventions on scabies and its complications, and ensure long-term surveillance after MDA is stopped. Regular monitoring of sentinel communities, with some of them selected randomly, is a crucial part of the M&E strategy.

M&E programmes

The M&E frameworks for other NTD programmes can be adapted for scabies control. Approaches include collecting epidemiological data on scabies over time from sentinel sites and obtaining representative samples from randomly selected areas at each phase of monitoring. A hybrid model, which combines sentinel surveillance of high-transmission sites, representative sites and randomly selected sites, is feasible. Any areas of high-transmission identified during initial mapping could be candidates for sentinel site surveillance after the intervention (*12*).

An M&E programmes should:

- measure the impact on scabies prevalence and associated complications;
- incorporate coverage surveys and supply chain management; and
- integrate scabies reporting into routine health surveillance activities.

Results from monitoring should be communicated to front-line workers and communities to ensure the sustainability of the programme.

Monitoring of impact should include the burden of scabies, the burden of complications and health and socioeconomic effects. The frequency of monitoring and its integration with other NTD interventions should be determined during the development of the control strategy (*12*).

Addressing recrudescence of scabies

Monitoring for recrudescence of transmission after cessation of MDA is critical. Low-level rebound has been documented several years after MDA in some settings, such as the Solomon Islands, and anecdotal reports indicate a similar pattern in areas where MDA for onchocerciasis was conducted (*43*). This underscores the need for ongoing surveillance.

Need for new diagnostic tools

Coverage surveys, widely used in NTD programmes, help document the achievement of treatment targets but are insufficient for measuring the impact of interventions. New tools may be necessary for M&E, as clinical diagnosis will become more challenging as the prevalence decreases. Developing point-of-contact diagnostic tests, such as rapid serological tests, could facilitate long-term monitoring and integration of monitoring into other health screening activities (*12*).

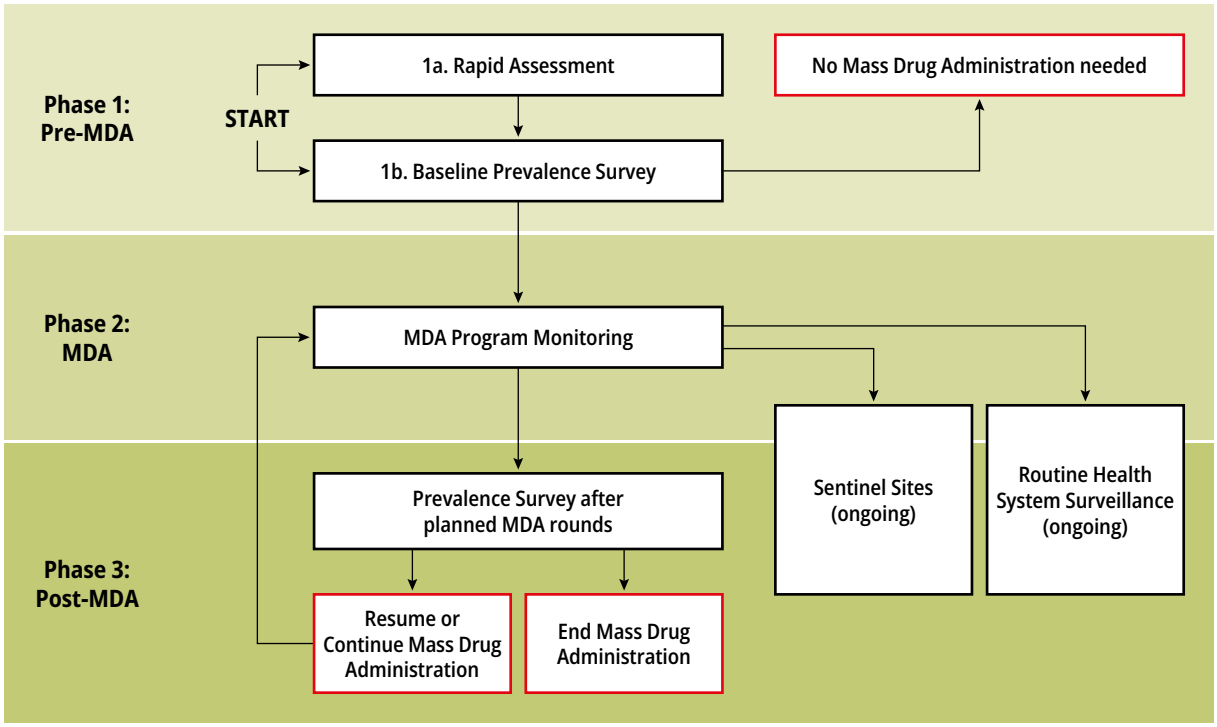
4.2 Indicators

The M&E programme is designed to measure specific processes, performance and impact indicators to answer the following questions (*50*):

- Process indicators: Are the programme's activities taking place successfully?
- Performance indicators: Is the programme reaching the target population?
- Impact indicators: Is the programme improving health outcomes as intended?

The M&E activities and indicators are embedded throughout the phases of the scabies MDA control programme. Fig. 6 shows the workflow of the different phases of MDA, and Table 3 summarizes the key M&E indicators and how they will be measured during each implementation phase. To date, a detailed M&E plan for other control strategies for scabies, such as IDM, is lacking.

Fig. 6. M&E MDA for scabies workflow



Source: *Monitoring and evaluation plan for mass drug administration programs for scabies control* (50).

Table 3. Overview of key M&E indicators

Programme phase	Aim	Key M&E indicators	Measured
Phase 1a: Pre-MDA	Determine whether scabies is a public health problem	A. Disease prevalence	• Rapid assessment
Phase 1b: Pre-MDA	Determine choice of control strategies	B. Disease prevalence	• Baseline prevalence survey
Phase 2: MDA	Ensure safe and effective implementation of MDA	C. Treatment coverage	• Treatment registers • Summary reports of drug administration • Coverage survey
		D. Serious adverse events (SAEs)	• SAE reporting sheets
		E. Process indicators	• Evaluation of staff training programme • Community sensitization key informant interviews

Table 3 *continued*

Programme phase	Aim	Key M&E indicators	Measured
Phase 3: Post-MDA	Evaluate effectiveness of control strategy and need for modifications	F. Disease prevalence	• Prevalence survey 9–15 months after the final planned round of MDA
		G. Disease prevalence	• Reporting from sentinel sites
		H. Episodes of care	• Reporting routine health facility data on disease

MDA: mass drug administration.

Source: *Monitoring and evaluation plan for mass drug administration programs for scabies control* (*50*).

4.2.1 Phase 1: Pre-MDA

As explained in Section 3.1, the first step is to assess the disease situation, identify whether a scabies control strategy may be needed, and guide decision-making on which specific control strategies to implement based on the disease burden.

Disease burden should be measured as the prevalence of disease at a whole community level or within specific target populations. The burden of disease estimates for M&E in scabies control programmes should include scabies and impetigo. If resources permit, monitoring other health outcomes such as skin and soft tissue infections, invasive bacterial infections, rheumatic fever and quality of life measures (individual or household level) may also be considered (*50*).

4.2.1.1 Disease prevalence

Disease prevalence is the key indicator used to determine whether scabies is a public health problem and to determine the choice of control strategies.

Aim: Determine whether scabies is a public health problem
Key indicator: Disease prevalence
Measured: Rapid assessment

Aim: Determine choice of control strategies
Key indicator: Disease prevalence
Measured: Baseline prevalence survey

This key indicator and these measures have been explained in detail in Section 3.1.1: Mapping the burden of the disease.

4.2.2 Phase 2: MDA

Monitoring the implementation of the MDA requires collecting data on both the processes and the performance of the programme (*50*).

- **Performance indicators**: Is the programme reaching the target population?
- **Process indicators**: Are the programme's activities taking place successfully?

4.2.2.1 Treatment coverage

The key indicator for the performance of an MDA programme is treatment coverage, which measures whether the program successfully reaches the targeted population.

Aim: Ensure effective implementation of MDA
Key indicator: Treatment coverage
Measured:

- Treatment registers
- Summary reports of drug administration
- Coverage supervision survey

Monitoring of coverage indicates how well MDA programmes are implemented. Accurate record-keeping of those who were offered treatment and whether they took the treatment allows accurate calculation of treatment coverage. Recording reasons for treatment refusal can inform programme modifications as needed (*50*).

Treatment coverage is the proportion of individuals eligible or targeted for MDA in a specified population who receive and swallow or apply correctly the treatment indicated by the programme (*50*).

The current recommendation is **to reach ≥ 80% of the population** with either ivermectin tablets or permethrin cream (see Section 3.2.2.1.4).

$$\textit{Programme treatment coverage (\%)} = \frac{\textit{Number of individuals in the target population receiving treatment via MDA } x\ 100}{\textit{Number of individuals targeted for treatment}}$$

To calculate treatment coverage, an accurate population count before MDA implementation is needed, and it should be retained and updated for subsequent rounds of MDA.

Registers and summary reports for treatment administration. Information on people receiving MDA should be collected when and where treatment is provided. The minimum information to be collected is sex and age group (Box 10).

Box 10. Information to be collected on persons receiving MDA

- Number of people targeted
- Number of people to whom treatment is offered
- Number of people who were directly observed taking or applying treatment by age and sex
- Number of people who refused MDA treatment
- Reasons for refusal

Annex 5 provides a model tally sheet for recording information on individuals who receive treatment (*61*). When each MDA round is complete, a summary report (see example in Annex 6) should be prepared for the entire EU.

Coverage survey. This is typically conducted by a supervisor immediately following the MDA to assure the quality of the data reported by MDA teams and to identify any areas where further activities may be required to improve coverage (*50*).

An example of a coverage survey tool (CST) for other NTD MDA programmes is included in Annex 7. The tool is used by supervisors who are required to interview a small number of key informants from within the community to validate reported coverage data and gather input on overall performance of the programme (*62*). Annex 8 details the MDA Coverage Survey Protocol used in the Solomon Islands.

4.2.2.2 Serious adverse events

Aim: Ensure safe and effective implementation of MDA
Key indicator: Serious adverse events (SAEs)
Measured: Serious adverse event reporting sheets

Although ivermectin is widely used and considered a safe medication, reporting adverse events (AEs) is generally a pharmacovigilance requirement of MDA programmes. This reporting should be restricted to serious adverse events (SAEs) (*61*).

Programme managers should coordinate and collaborate with the national pharmacovigilance team at the MDA planning phase and agree on the protocol for reporting and managing AEs/SAEs from the peripheral level to the national level (Box 11). This protocol should ensure that most AEs/SAEs can be managed at the dispensing level of the medicine through primary care health workers or drug distributors and referral networks for higher-level care established when necessary (*50*).

Box 11. Reporting SAEs

The MDA report should include information on:

- the number of SAEs reported, by therapeutic agent and type of adverse event;
- the outcomes of causality assessments;
- any atypical or unusually large clusters of SAEs; and
- a summary of other relevant investigations.

4.2.2.3 Process indicators

Aim: Ensure safe and effective implementation of MDA
Key indicator: Process indicators
Measured:

- Evaluation of staff training programme
- Community sensitization key informant interviews
- Medicine management

Process indicators measure the successful implementation of ongoing programme activities. Following each round of MDA, a formal evaluation of the successes, challenges and learnings from the preparation and implementation phases of the project should be carried out to improve MDA implementation during the next round (*50*).

Key areas of programme implementation to be monitored and recommended methods are summarized below.

- *Training* involves pre- and post-training assessment and participant feedback forms to identify what information participants have learnt through the training process.
- *Community sensitization and mobilization* determine which community outreach strategies were useful. This information can be collected during the key informant interviews conducted as part of the supervisor's coverage survey post-MDA (see Section 4.2.2.1).
- *Medicine procurement and management* tracks the movement of drugs from their arrival at the national or central level to their arrival at lower-level health facilities ready for MDA implementation. District or sub-national health offices should prepare a summary report when unused medicines are returned to the central level.

4.2.3 Phase 3: Post-MDA (follow-up after the MDA campaign)

Impact indicators evaluate if the scabies control programme has been successful and to determine if MDA (or the strategy followed) can be ceased.

WHO consensus recommendations advise that MDA should be ceased once the prevalence of scabies is below 2% (*12*). A **prevalence survey** should be conducted after the final planned round of MDA to determine if prevalence has been reduced to below 2% and if MDA can be ceased (*50*).

Monitoring of **sentinel sites** is optional but can be used at any stage of the programme to monitor the effectiveness of interventions during the programme. Ongoing surveillance through the routine health information system based on the reporting of cases by primary healthcare workers will provide valuable information for longitudinal monitoring of disease burden, especially post-MDA (*50*).

4.2.3.1 Disease prevalence

Aim: Evaluate the effectiveness of the control strategy and the need for modifications

Key indicator: Disease prevalence

Measured:

- Prevalence survey 9–15 months after final planned round of MDA
- Reporting from sentinel sites

Prevalence survey

A **prevalence survey** should be carried out 9–15 months after the final planned round of MDA to assess the impact of the intervention. This survey should use a two-stage randomized cluster design, similar to the baseline prevalence survey explained in Section 3.1.1.2, but with a recalculated sample size based on the expected prevalence post-MDA. The prevalence survey should be carried out in all EUs where MDA took place (*50*).

If the prevalence survey shows that scabies prevalence is still above 2%, further round(s) of MDA should be implemented (*50*).

Sentinel sites

Programmes should consider monitoring trends in disease burden before, during and after the implementation of control strategies via selected sentinel sites. This approach enables assessment of the effectiveness of interventions over time and identification of areas that may subsequently require additional intervention or the strengthening of the intervention rather than waiting until the end of the control programme (*50*).

Selection of sentinel sites: Programmes should aim to select at least one per EU, or more if resources allow. The criteria for selecting sentinel sites are as follows (*50*):

- A sentinel site is either a cluster or a clinic serving a cluster.
- The population accessed should be at least 100–300 individuals (consistent with cluster selection criteria described previously).
- The sentinel site should be chosen from an area of anticipated higher prevalence as determined by baseline surveys.
- The population at the site should be stable to ensure consistent data collection over time.

Including sentinel sites from areas with lower prevalence helps to understand the spatial and temporal heterogeneity in transmission. Long-term monitoring is essential to track whether transmission heterogeneity persists after treatment or new areas become hotspots of transmission (*12*).

Data collection: Sentinel sites should collect data on:

- the prevalence of scabies and impetigo; and
- other disease burden markers, where possible.

Monitoring at sentinel sites should include both process indicators (e.g. MDA coverage) and impact indicators (e.g. impact of treatment on disease prevalence). These evaluations should be linked whenever possible (*12*).

4.2.3.2 Episodes of care

Aim: Evaluate the effectiveness of the control strategy and the need for modifications
Key indicator: Episodes of care
Measured: Reporting routine health facility data on disease

Routine health system surveillance

Implementation of a scabies control programme should incorporate training of personnel at the community, district and national levels so that routine surveillance strategies can be incorporated into existing health services and to establish precise mechanisms for regular reporting of scabies prevalence and initiation of future control strategies where needed (*50*).

Health information systems could be modified to capture scabies and impetigo as specific entities for facility reporting on episodes of care. Strengthening skills for identifying scabies and impetigo at the primary healthcare level could enhance routine reporting (*50*).

If routine reports show a rise in scabies cases, the health ministry (or equivalent) should reevaluate the need to conduct prevalence surveys and initiate control strategies in accordance with current scabies control recommendations (*50*).

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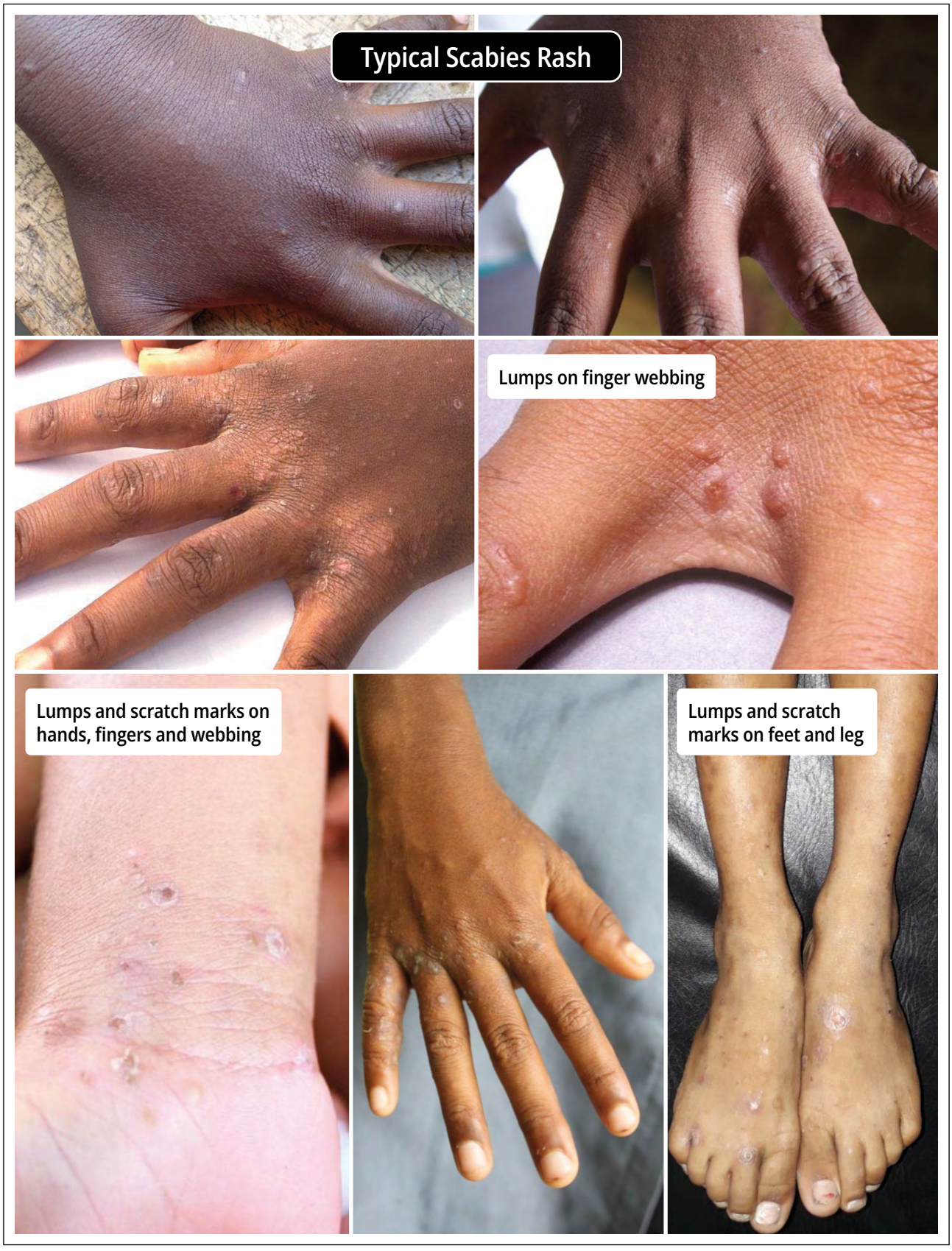
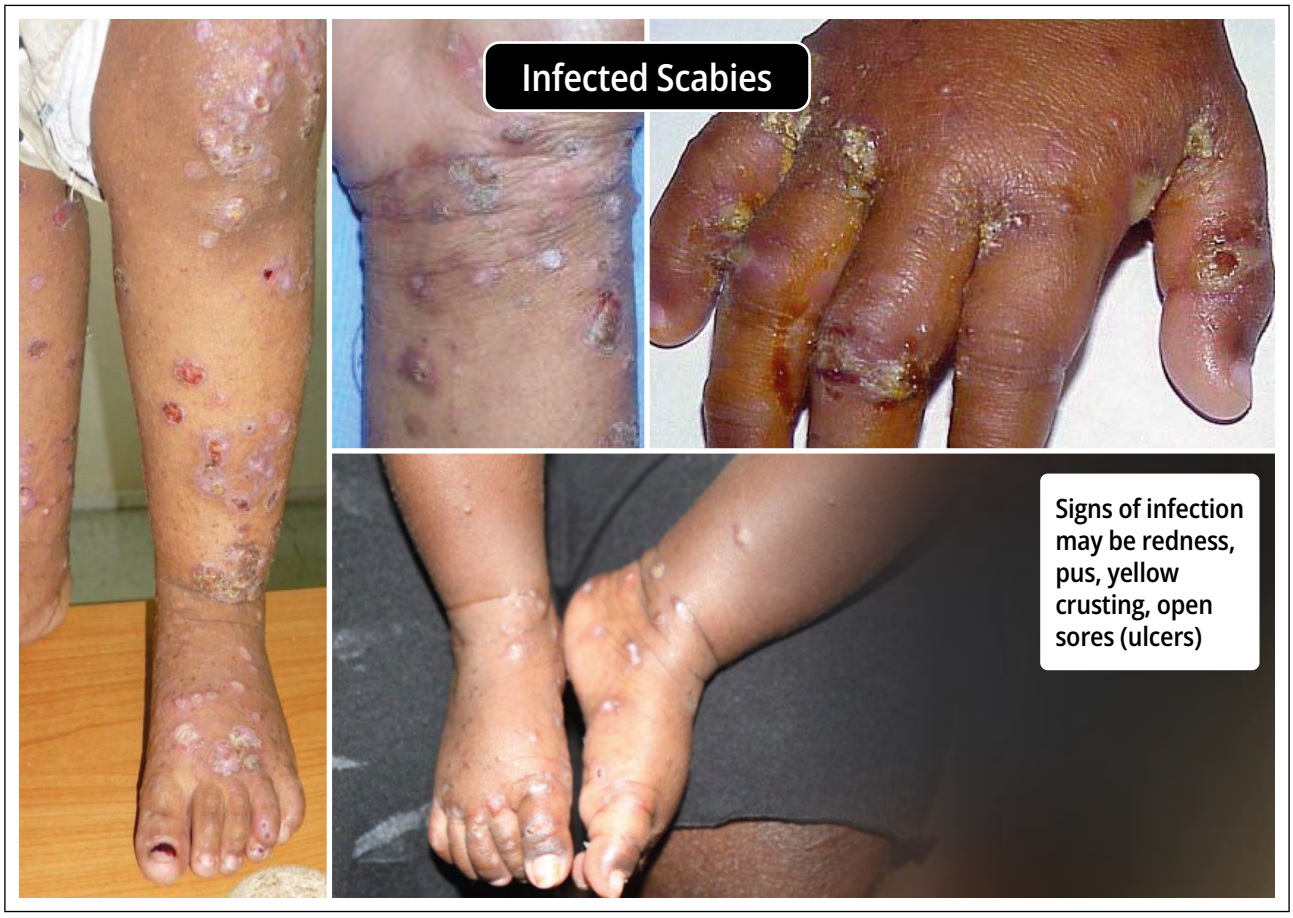
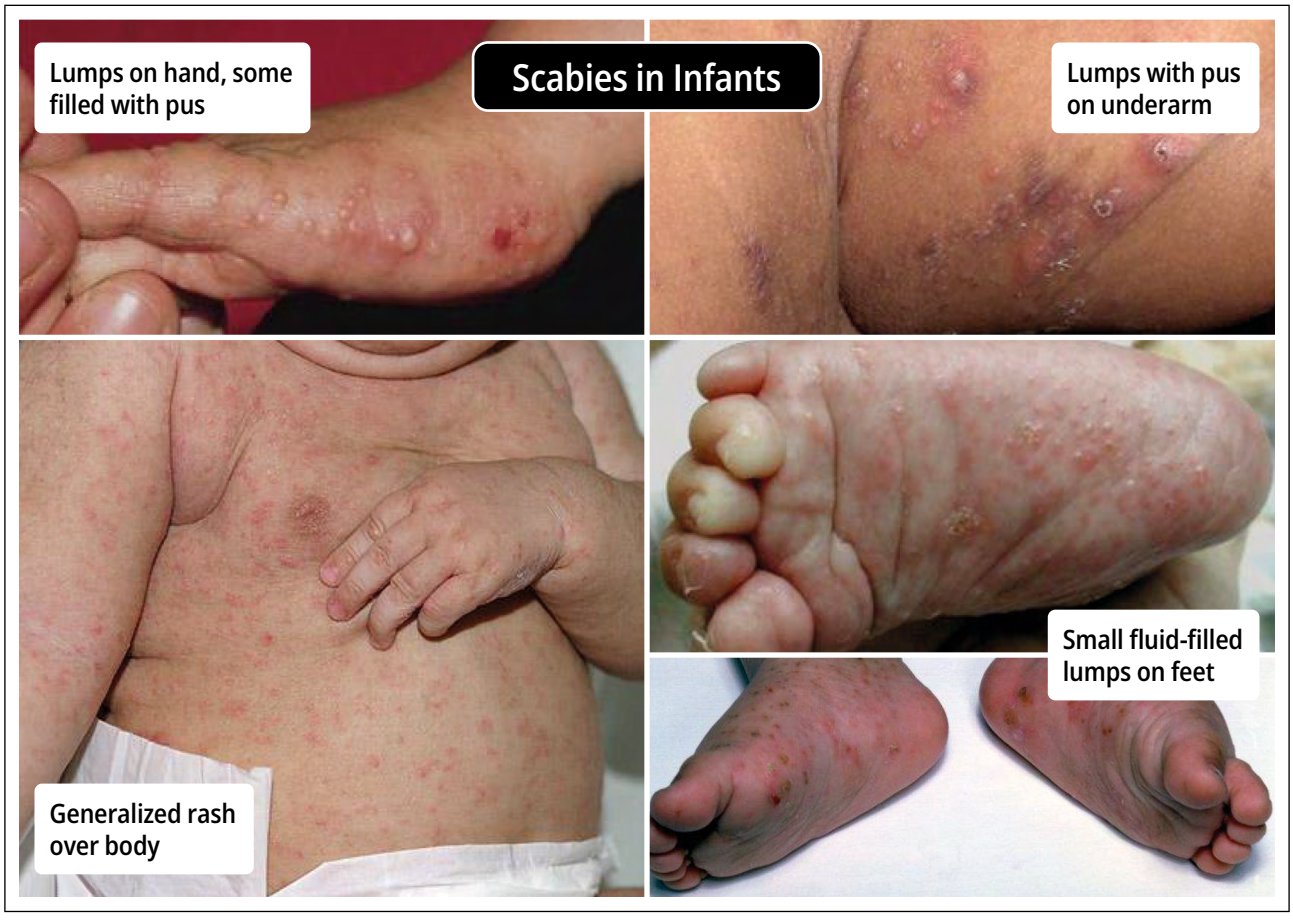
Annex 1. Scabies reference sheet

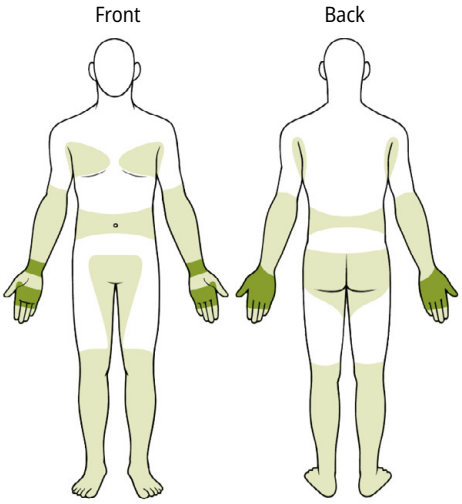



Infected Scabies
Signs of infection may be redness, pus, yellow crusting, open sores (ulcers)

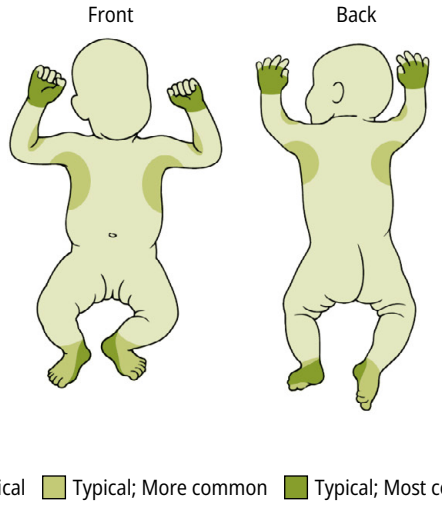

Scabies in Infants
Lumps on hand, some filled with pus
Lumps with pus on underarm
Generalized rash over body
Small fluid-filled lumps on feet

Scabies Rash Distribution

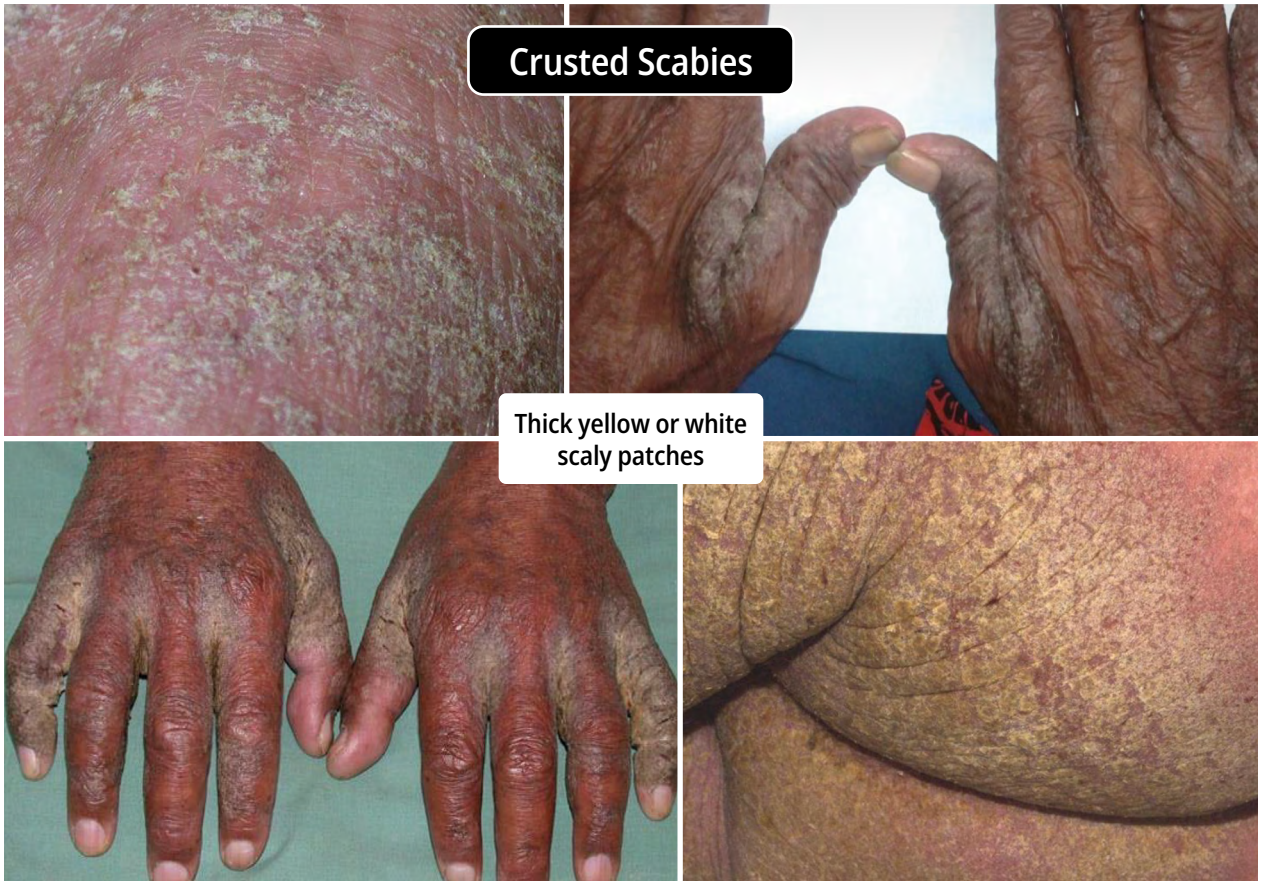
Children and Adults

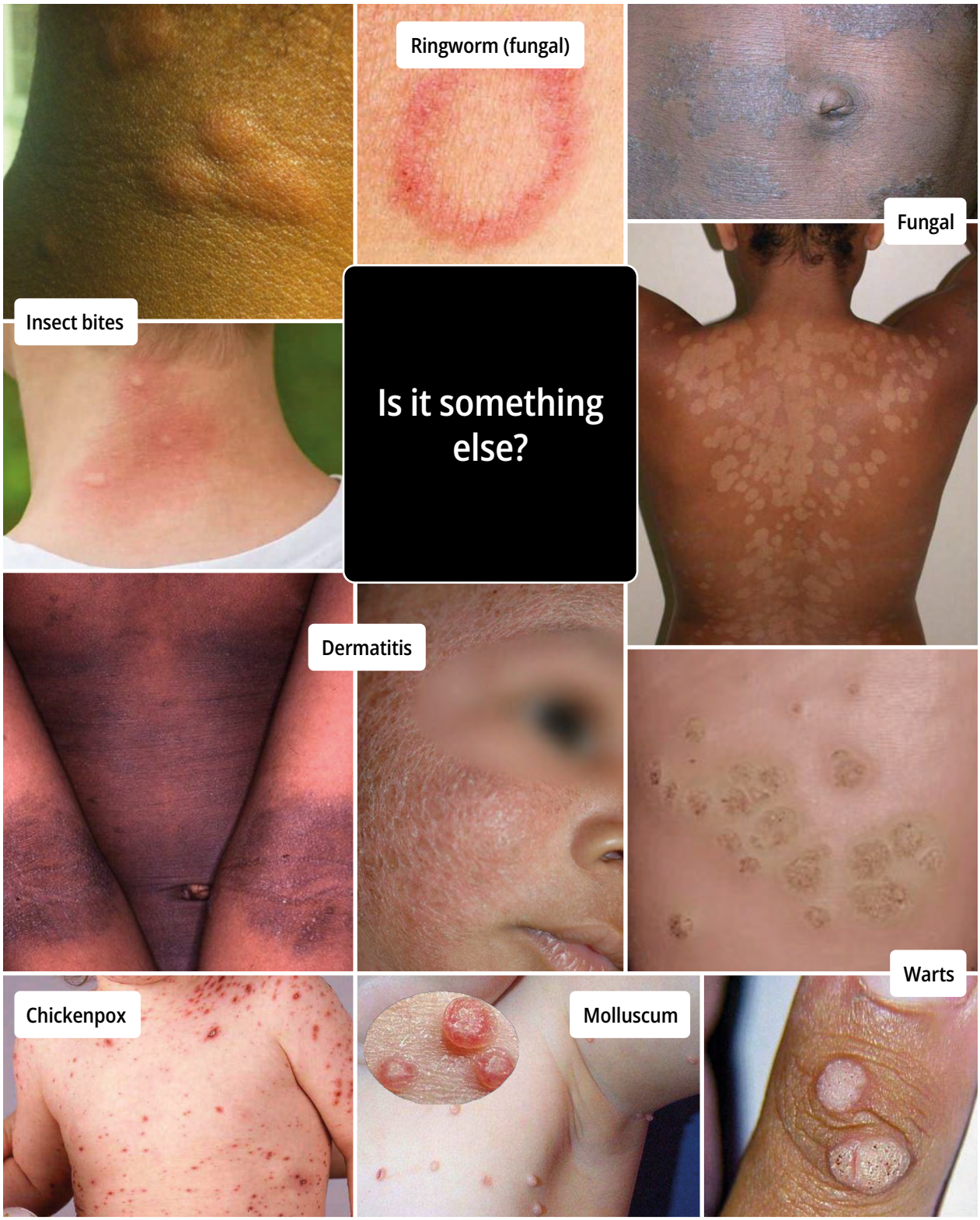


Infants < 2 years



Crusted Scabies





Main reference: Engelman D et al. The 2020 International Alliance for the Control of Scabies Consensus Criteria for the Diagnosis of Scabies. Br J Dermatol. 2020;183(5):808-20. Images: Aileen Chang, Arum Krismi, C. D. Wollach, Daniel Engelman, Rie Yotsu, Roderick Hay, Scott Norton, DermNet NZ, The Primary Care Dermatology Society UK, Healthy Skin Menzies, One Disease, Evanherk, Margot Whitfeld, Meciusela Tuicakau

Annex 2. Summary of mass drug administration trials for scabies control

Region, country (reference)	N	Intervention	Scabies assessment method	End-point used	Scabies			Impetigo		
					Baseline prevalence	Post-MDA prevalence	Relative reduction	Baseline prevalence	Post-MDA prevalence	Relative reduction
Africa										
United Republic of Tanzania (1)	2269	Ivermectin 1 dose, 4 years	Community health workers trained in clinical diagnosis of scabies	12 months	4.4%	0.8%	80.9%	–	–	–
Central/South America										
Brazil (2)	576	Ivermectin 2 doses in parasitic skin disease/ intestinal helminths and households	Experienced examiner	9 months	3.8%	1.5%	60.5%	–	–	–
Panama (3)	756	Permethrin 2 doses	Experienced examiner	12 months	33%	1.1%	96.7%	–	–	–
Pacific										
Australia (4)	1013	Ivermectin 1 dose in non-scabies 2 doses in scabies	Health workers using clinical guidelines	12 months	4%	9%	225% (increase)	–	–	–
Australia (5)	2200	Permethrin 1 dose in non-scabies and mild scabies 2 doses in moderate-severe scabies and house fumigated	Experienced examiner	7 months	35% Only children	4.1%	88.3%	22.5%	5.3%	76.4%
Australia (6)	200–250	Permethrin 1 dose 2 doses if heavy infestation	Unclear	10 months	28.8%	9.5%	67%	49%	23%	53.1%

Table *continued*

Region, country (reference)	N	Intervention	Scabies assessment method	End-point used	Scabies				Impetigo	
					Baseline prevalence	Post-MDA prevalence	Relative reduction	Baseline prevalence	Post-MDA prevalence	Relative reduction
Pacific										
Fiji (7)	2051	A. Ivermectin B. Permethrin 1 dose in non-scabies 2 doses in scabies	According to clinical guidelines	12 months	A. 32.1% B. 41.7%	A. 1.9% B. 15.8%	A. 94% B. 62.1%	A. 24.6% B. 24.6%	A. 8% B. 11.4%	A. 67.5% B. 53.7%
Papua New Guinea (8)	31	Ivermectin 1 dose	Unclear	5 months	87%	26%	70.1%	–	–	–
Solomon Islands (9)	26 188	Ivermectin 2 doses and azithromycin	Experienced examiner	12 months	18.7%	2.3%	87.7%	24.8%	6.4%	74.2%
Solomon Islands (10)	1291	A. Ivermectin B. Ivermectin and azithromycin 1 dose in non-scabies; 2 doses in scabies	Experienced examiner	12 months	10.5%	0.8%	92.4%	A. 10.1% B. 12.1%	A. 2.5% B. 3.3%	A. 75.2% B. 72.7%
Solomon Islands (11)	1558	Ivermectin 2 doses	Experienced examiner	12 months	24%	3%	87.5%	40%	34%	15%

MDA: mass drug administration.

Source: Table adapted from *Mass drug administration for the control of scabies: a systematic review and meta-analysis* (12).

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Annex 3. Diagnostic criteria for impetigo

Diagnostic criteria for impetigo

- Papular, pustular or ulcerative lesions surrounded by erythema, or with crusts, pus or bullae.
- Scabies lesions with signs of secondary infection should also be classified as impetigo.
- Impetigo lesions should be counted and classified according to their number:
  - **Very mild** (1–2 lesions)
  - **Mild** (3–10 lesions)
  - **Moderate** (11–50 lesions)
  - **Severe** (> 50 lesions)

Annex 4. Standard operating procedures for dosing during mass drug administration

Standard Operating Procedures for Dosing During MDA

Procedures:

1. Explain the MDA and obtain consent before administering treatment. Register the person's details in the treatment register.
2. Check if an individual has any exclusion criteria and provide medication according to the following procedures.
3. Safely dispense the medicines. If leaving the 2nd dose ensuring that the 2nd dose is packaged and labelled correctly.

Tips for safe dispensing of tablets:

- Wash hands before dispensing tablets, wear gloves if possible.
- Use tablets from opened bottle before opening another bottle.
- Do not handle the medicines in your hands. Use a clean spoon to get the tablets out of the bottle. Tip the medicine from the cap in the hand of the person.
- Provide clean, safe water for person to swallow the tablets. Tablets do not need to be swallowed altogether.
- Do not force children to swallow tablets. For young children you can crush tablets using a spoon. Crush or cut tablets and mix with water for children if they have difficulty swallowing tablets.
- Watch them take all the medications (DOT - directly observed therapy).
- If leaving the 2nd dose make sure that it is packaged and labelled correctly. Label with the patient's name, the number of tablets, and the date they should take the 2nd dose. The 2nd dose should be taken 7 to 14 days after the 1st dose.

Does the person have any reason they should not receive ivermectin tablets?

Criteria	Ivermectin	Permethrin
Standard Treatment	Yes	No
Children <2 years old	No	Yes
Children >2 years and less than 90cm	No	Yes
Pregnant women/women who think they are pregnant	No	Yes
Mothers breastfeeding babies under 7 days old	No	Yes
Severely ill (too sick to perform activities of daily living (ADLs) and confined to bed)	No	Yes
People who are taking warfarin	No	Yes

Ask the following questions to determine if the person should receive ivermectin or permethrin cream

Question 1: Children - What age and height are they?

Less than 2 years	Permethrin
Over 2 years and less than 90cm (red on dose pole)	Permethrin
Over 2 years and more than 90cm (green and above on dose pole)	Ivermectin

Question 2: Women 12 to 50 years – Are they pregnant?

If YES pregnant		Permethrin
If NOT pregnant		Ivermectin
If unsure - when was last period?	If unsure or more than 6 weeks	Permethrin
	If less than 6 weeks	Ivermectin
Or if not yet started menses or menopause		Ivermectin

Question 3: Women 12 to 50 years - Are they breastfeeding?

If NO breastfeeding		Ivermectin
If YES breastfeeding	If baby less than 1 week old	Permethrin
	If baby more than 1 week old	Ivermectin

Question 4: Are they taking warfarin? Are they seriously ill (too unwell to perform activities of daily living (ADLs) and confined to bed) and in bed?

If YES warfarin	Permethrin
If NO warfarin	Ivermectin
If YES serious illness	Permethrin
If NO serious illness	Ivermectin

Determine dose of ivermectin tablets

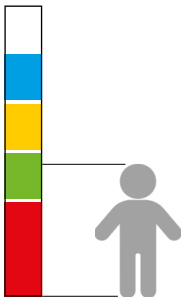
What tool should I use?

Age	Dosing Tools
Less than 2 years	Permethrin cream
2 to 15 years	Height stick
15 years or more	Body chart

How to use the height stick

For people under 15 years use the height stick. Make sure the person is standing on flat ground, feet together, looking straight ahead. Line the top of the head to the colour and then use the chart below to determine the number of tablets to give the person.

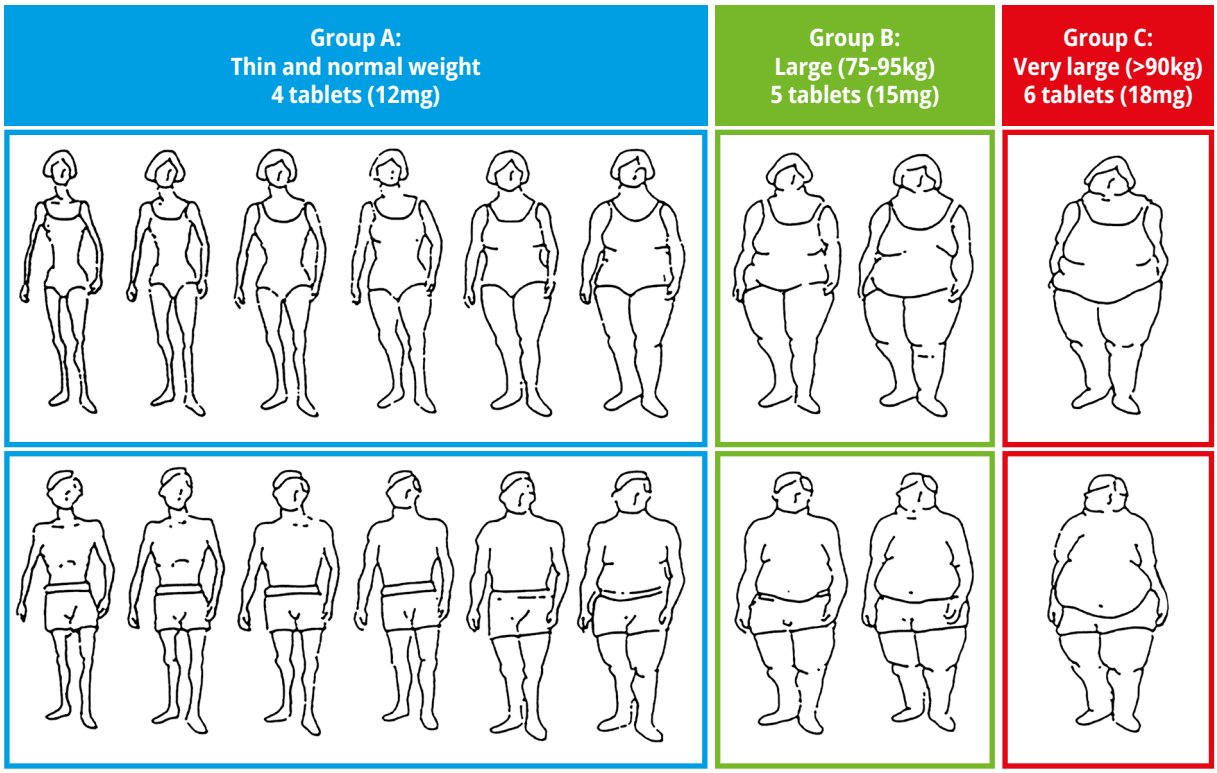
Height stick colour	Number of ivermectin 3mg tablets
White (>156cm)	4 tablets (12mg) or more
Blue (139 to 156cm)	3 tablets (9mg)
Yellow (113 to 138cm)	2 tablets (6mg)
Green (90 to 112cm)	1 tablet (3mg)
Red (90cm below)	Permetrina cream



How to use the body chart

For people over 15 years of age use the body chart to determine the dose of ivermectin.
Observe the person's body shape to determine if they are large or very large and require more tablets.

Ivermectin Adult Dosing Chart - Solomon Islands



Determine dose of permethrin cream

For those children and adults who need to use permethrin cream, provide the tubes and information sheet and explain to the person or caregiver how to use the cream. Explain that they should apply the cream before going to bed and washed off in the morning.

Age	Dosing Tools	Directions
<2 months	**¼ tube**	Apply to body, face, neck and ears. Leave for **4 hours** then wash off
2 months to 12 years	**¼ tube**	Apply to body, face, neck and ears. Leave for **8 hours** then wash off
Over 12 years	**1 tube**	Apply to body from neck down. Leave for **8 hours** then wash off

Instructions - Permethrin Cream

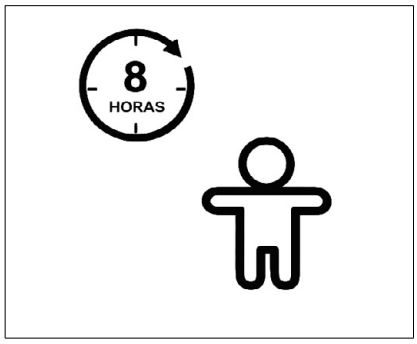
Make sure skin is clean and dry. If you wash the cream off early, you put more on.

Infants below 2 months

Rub on the **whole-body** including scalp, neck, face and ears

Do not rub into eyes / mouth / open sores

Leave for **4 hours** and wash off



Children 2 months to 1 year

Rub on the **whole-body** including scalp, neck, face and ears

Do not rub into eyes / mouth / open sores

Leave overnight for **8 hours** and wash off

Children and adults over 1 year

Rub on the **body from neck down**, especially between fingers and toes

Do not rub into eyes / mouth / open sores

Leave overnight for **8 hours** and wash off

Dispensing the 2nd dose

If you are leaving behind the 2nd dose you must:

- Package each person's dose separately in a dispensing bag
- Ensure it is labelled correctly:
  - Medication name and strength
  - Batch number and expiry date
  - Patient name
  - The dose
  - When to take it
- Tell the patient when they should take the medicine and how to dispose of it safely if they do not take it (must return to a clinic for disposal)
- Give it to a responsible adult (over 18 years) to store responsibly
- Record it in the register book

Example labels:

Keep out of reach of children

Ivermectin 3mg tablets
Batch: abc123 Expiry 31/03/24

Name: Bob Banana
Take **4** tablets on **Monday 19/2/24**
Dispenser: **SL**

This medicine is only for the person named on the label.
If you do not take the tablets, please return it to a nurse for safe disposal.

Keep out of reach of children

Permethrin 5% cream
Batch: abc123 Expiry 31/03/24

Name: Baby Banana
Apply **1/2** tube of cream to the whole body from the neck down and leave overnight on **Monday 19/2/24**
Dispenser: **SL**

This medicine is only for the person named on the label.
f you do not use the cream, please return it to a nurse for safe disposal.

Annex 5. Example register for recording treatment administration

Form 1: Mass drug administration booklet

Subdivision:	Nursing zone:	Community name (settlement/village/school):	Page ..... of	
Date of administration:	Distributor name:	Distributor signature:	Dose 1 ☐	Dose 2 ☐

No.	Full name	Age	Height category	Sex		Exclusion* (1 - 7)							No. given		Observed	Remarks / reason declined
				F	M	1	2	3	4	5	6	7	IVM	PER	DOT (tick)	
1																
2																
3																
4																
5																
6																
7																
8																
9																
10																
11																
12																
13																
14																
15																
16																
17																
18																
19																
20																

* Code for exclusion: 1. <2 years, 2. <90cm, 3. Pregnant, 4. Breastfeeding women with infants <1 week old, 5. On warfarin, 6. Very ill, 7. Declined

DOT - tick if directly observed swallowing tablets or applying the cream

Annex 6. Summary report on mass drug administration

Form 2: Nursing zone coverage summary

Subdivision:	Nursing zone:	Person reporting:	Date:

Number of IVM tablets received:	Number of IVM tablets used:	Number of IVM tablets remaining:	Number of PER tubes received:	Number of PER tubes used:	Number of PER tubes remaining:

IVM = ivermectin 3mg tablets, PER = permethrin 5% cream tubes

Catchment name	Pop.	Dose 1						Dose 2						Total qty dispensed dose 1		Total qty dispensed dose 2		Remarks
		0 to 4 years		5 to 14 years		Adults (≥15 years)		0 to 4 years		5 to 14 years		Adults (≥15 years)						
		F	M	F	M	F	M	F	M	F	M	F	M	IVM (tabs)	PER (tubes)	IVM (tabs)	PER (tubes)	
	TOTAL																	

Person reporting signature: ..... Reporting date: .....

Annex 7. Example coverage survey tool from Fiji lymphatic filariasis control programme

CST data collection form

Supervision area:	Subdivision:	Survey implementer:	Interviewer(s):	Date(s):

No.	Date	Village	Respondent				Were you offered LF MDA Drugs during the MDA week? *Show respondent the example of the drugs* (circle correct answer) Y - Yes N - No U - Unsure	If not, why? A - Away at work/farm/ traveling S - Suply ran out. D - Distributor never came O - Other	If other, remark	Did you swallow the MDA week *Show respondent the example of the drugs* (circle correct answer) Y - Yes N - No U - Unsure	How did you access the tablets D - DOT (Home) H - DOT at Health facility S - DOT at School W - DOT at Work O - Other district	Verify mark on finger (circle correct answer) Y - Yes N - No U - Unsure	If not, why? F - Fear of side effects N - Not enough information T - Taste O - Other	If other, remark	Additional information	
			ID number		Age	Sex M - male F - female									Were you aware of the MDA campaign, its benefit and reason for MDA info Y - Yes N - No	How did you know of the MDA campaign M - Media V - Village meeting/ turagani koro F - Family members O - Others (specify)
			HH#	FM#												
1							Y N U			Y N U		Y N U				
2							Y N U			Y N U		Y N U				
3							Y N U			Y N U		Y N U				
4							Y N U			Y N U		Y N U				
5							Y N U			Y N U		Y N U				
6							Y N U			Y N U		Y N U				
7							Y N U			Y N U		Y N U				
8							Y N U			Y N U		Y N U				
9							Y N U			Y N U		Y N U				
10							Y N U			Y N U		Y N U				
11							Y N U			Y N U		Y N U				
12							Y N U			Y N U		Y N U				
13							Y N U			Y N U		Y N U				
14							Y N U			Y N U		Y N U				
15							Y N U			Y N U		Y N U				
16							Y N U			Y N U		Y N U				
17							Y N U			Y N U		Y N U				
18							Y N U			Y N U		Y N U				
19							Y N U			Y N U		Y N U				
20							Y N U			Y N U		Y N U				
Total							**Y -** **N -** **U -**			**Y -** **N -** **U -**		**Y -** **N -** **U -**				

Annex 8. Mass drug administration coverage survey protocol used in the Solomon Islands

Solomon Islands
MDA Coverage Survey Protocol

Objectives

- To validate reported coverage rates: The results of coverage surveys can be used to check the accuracy of the system for recording and reporting data and take corrective actions where necessary.
- To identify reasons for non-compliance: The common reasons for not swallowing the medicines can be identified, allowing the NTD program to improve social mobilization before the next round of MDA.
- To determine the usefulness of the various community awareness components: Provides feedback on which community awareness strategies reached the populations, e.g. radio, television, social media or health promotion teams. This can determine which components provide best reach to inform the next round of MDA.

Description of Sample

In this survey design, subunits (e.g. villages) will be chosen with probability proportionate to estimated size (PPES). In the field, the subunits selected for the survey sample will then be divided into segments of approximately 25 households. One segment is selected at random, and a fixed proportion of households is selected systematically from among the segments selected.

Calculation of overall sample size

$$N = \frac{(DEFF)(Z^2)(p)(1-p)}{\delta^2(1-r)}$$

p=expected coverage

δ =desired precision

DEFF=design effect=2

α=alpha

r=non-response rate

$$N = \frac{(2)\,(1.96^2)\,(0.7)\,(1-0.7)}{0.05^2(1-0.1)} = 717 \text{ people}$$

A random selection of 30 clusters (cluster ≈ 25 houses) will selected using probability proportional to size. For Solomon Islands the program will randomly select 30 clusters in 5 randomly selected provinces. In each cluster randomly select 10 houses, and all household members present will be interviewed. This will be approximately 1400-1800 people to be interviewed, from 300 households in 30 villages.

Five randomly selected provinces are - Honiara, Malaita, Central, Makira, Isabel

Methodology

National program staff will conduct random coverage assessments while conducting supervision of the MDA. Staff will be provided with the clusters to be targeted. On arriving in the village the staff will inform the village leaders of the purpose of their visit. The team will work with village representatives to divide the village into segments of approximately of 50 houses if the village has more than 50 houses. The staff will then randomly select a segment by placing numbers in a container and selecting one.

The survey team should work with a local guide to identify a walking route that will pass by every house in the segment and determine which household will serve as the initial household. Flip a coin to determine if List A or List B will be used. The team follows the route through the segment and selects the household that corresponds to a number on the selected list. The initial house is house zero. At selected households all present household members will be invited to participate. If there are some household members absent, the team should ask when they will return and see if they can come back later in the day to interview them.

If no one is home, make a note in the log and move to the next number in the list. If you reach 50 houses but have not interviewed 10 houses, then start at the beginning again and carry on with the numbering. If there are less than 50 houses in the segment, move the next village to complete 10 houses.

List A	0	5	10	15	20	25	30	35	40	45	50	56	61	66	71	76
List B	4	9	14	19	24	29	34	39	44	50	55	60	65	70	75	80

Survey Tool

"Hello, my name is <name>. I am here on behalf of the Ministry of Health. We are surveying houses in your community about the most recent community drug distribution or mass drug administration. We would like to know if the members of your house took the medicines. If you wish to participate in the survey, tell us and we will note your answer. If you agree, the survey will only take a few minutes. Taking part in the survey will help the Ministry of Health improve the program. It is anonymous and it is your choice to take part, or not to take part, in this survey. You may refuse without penalty.

1. Would you like to take part in our survey?"

a. Yes
b. No - skip to END and record the refusal

Name of Interviewer: _____

Province: _____

Village name: _____

Date of Interview: _____

ID Number for Household: _____

2. Age: _____

3. Sex (M/F):

a. Male
b. Female
c. Other

4. Did someone give you medicine to treat scabies during the MDA? [Show the pills and cream to the respondent]:

a. Yes – skip next question
b. No
c. Don't Know – skip next question

5. If not, why?

a. no one came
b. medicines finished
c. pregnant / breastfeeding
d. ill /old
e. afraid of side-effects
f. I don't have this disease
g. I am taking other medications
h. medicines don't work
i. other: _____

6. Did you get tablets or cream from the MDA team for scabies?

a. Tablets
b. Cream

7. Did you swallow the tablets or apply the cream?

a. Yes – skip next question
b. No – skip question 9

8. If no, why didn't you swallow the medicines or apply the cream?

a. afraid of side-effects
b. not enough information on the medicines
c. I don't have this disease
d. I am taking other medications
e. medicines don't work
f. I forgot to apply the cream
g. Other: _____

9. If yes, why did you swallow the medicines or apply the cream?

a. to be healthy
b. afraid of getting the disease
c. someone told me to
d. everyone else is taking it
e. other (specify) _____

10. Did someone give you a second dose of medicine a week or so later?

a. Yes
b. No – skip next 2 questions
c. Unsure

11. Did you feel any side effects after swallowing the medicines?

a. Yes
b. No – skip next 2 questions
c. Unsure

12. Did the side-effects stop you from doing your daily activities?

a. Yes
b. No
c. Unsure

13. What was the side effect?

a. Headache
b. Tired
c. Nausea
d. Rash
e. Other

14. If other what was it? _____

15. Were you aware of the MDA before the health team arrived in your village/location?

a. Yes
b. No – skip next question
c. Unsure

16. How did you know the MDA was going to happen? [Select all that apply]

a. family member/friend/neighbour
b. health promotion team visited the village
c. brochures/flyers
d. posters
e. banners
f. radio
g. TV
h. social media
i. other (specify) _____

17. Did a health team tell you about the MDA in your village/location?

a. Yes
b. No – skip next question
c. Unsure

Thank you for your time

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