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This Issue: Vector-borne diseases

Prevent Control

Vector-borne diseases
Chikungunya • Dengue • Japanese encephalitis • Kala-azar • Lymphatic filariasis • Malaria • Schistosomiasis
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Message from the Regional Director

On World Health Day this year, WHO is bringing global attention to diseases such as malaria, dengue, chikungunya, Japanese encephalitis, kala-azar, lymphatic filariasis and schistosomiasis. These diseases are putting our health at risk, at home and when we travel. These diseases are spread by vectors like mosquitoes, ticks and freshwater snails.

Vector-borne diseases account for 17% of the estimated global burden of all infectious diseases. Dengue is now the world's fastest growing vector-borne disease, with a 30-fold increase in disease incidence over the past 50 years. Outbreaks of dengue fever — a disease that did not exist till the 1950s — have now been reported from all 11 countries of WHO’s South-East Asia Region except for Democratic People’s Republic of Korea.

Forty per cent of the global population at risk of malaria lives in WHO’s South-East Asia Region. The disease is endemic in 10 of the 11 countries of the Region. Maldives is the only country in the Region that has remained free of malaria since 1984.

Japanese encephalitis has been killing people, especially young children with alarming regularity in a few established areas.

The extensive and rapid spread of chikungunya a few years ago is still vivid in our memories, a grim reminder that vector-borne diseases can strike without warning.

In spite of substantial progress made by Maldives, Sri Lanka and Thailand in reducing the disease burden due to lymphatic filariasis, the Region has 60 million infected people and 870 million people at risk of this infection.

Kala-azar has been endemic in Bangladesh, India and Nepal, with isolated cases reported from Bhutan and Thailand.

Vectors continue to surprise us. The ability of mosquitoes and other vectors to adapt and overcome public health interventions is creating new challenges in controlling these diseases. Resistance to commonly used insecticides has been a big challenge.

Social and environmental factors — including climate change — are key aspects affecting both the transmission and control of such diseases. In recent years, there has been a growing recognition of the importance of these ecological factors in influencing vector-borne diseases. To contain these diseases we must manage these risk factors.

Given the tropical nature of our Region, inefficient water management, rapid degradation of the environment, low priority given to health impacts in development activities, unplanned urbanization and widespread poverty, developing countries suffer far more from these diseases than the developed countries.

Vector-borne diseases have a significant impact on the socioeconomic status of communities and vigorously fuel a vicious circle of poverty. Their elimination will contribute to the economy and facilitate bringing the poor people into the mainstream.
The good news is that cost-effective technological tools are now available. Mass drug administration as preventive chemotherapy has already yielded excellent results in several countries. These interventions need to be applied through community-based ecosystem management and environment-friendly vector control. Encouraged by efficacy of these tools, the global community has already called for elimination of several vector-borne diseases during the next decade. At the same time, research continues to develop better and more cost-effective interventions.

It is now well recognized that prevention and control of vector-borne diseases warrant a comprehensive, multisectoral and all-encompassing response. This requires developing and implementing strategies, interventions and technologies to modify these environmental risk factors to substantially prevent and reduce the disease burden. Integrated vector management (IVM) is one such approach. IVM is a rational decision-making process for vector control. It advocates social mobilization, collaboration with other sectors, integration of non-chemical and chemical vector-control methods that are amalgamated into other disease-control programmes, and building national capacity to manage IVM programmes. IVM also stresses the importance of first understanding the local vector ecology and local patterns of disease transmission, and then choosing appropriate vector control tools.

Environment modification and its preservation should have a national approach that assures health as central to any developmental policy or plan. As these remain outside of the traditional domain of the health sector, this objective can be attained only through healthy policies or the application of concept of “Health in All Policies”. Health, environment and development policies must be fully aligned.

On World Health Day, WHO strongly urges rational use of medicines to combat malaria. Countries must prioritize vector-borne diseases in their national development agenda. And we must empower communities to prevent and control these diseases.

Preventing and controlling these dreaded vector-borne diseases is everyone’s responsibility!

Thank you.

Dr Poonam Khetrapal Singh
Regional Director
Strong malaria-control programme cuts reported cases by 99% since 2006

It is early morning in tropical Timor-Leste. A team of four uniformed men can be seen trawling a crocodile-infested wetland area just outside the capital city of Dili.

The men are equipped with soup ladles, pipettes and plastic bowls. Their eyes riveted to the ground, they are taking water samples for collection and storage in little plastic containers. These Ministry of Health staff are working for the National Malaria Control Programme in Timor-Leste. One of their tasks: to survey the density of mosquito larvae in the water and identify the different species in order to better understand the main vectors, how they behave and how to develop efficient measures to deal with them and thus protect people from malaria.

"In 2006, when I started to work with WHO on malaria control as a short-term consultant, we had no equipment for entomological surveys in Timor-Leste and only two full-time staff in the Ministry," reports Dr Manel Yapabandara, the WHO Technical Adviser on malaria. "So I brought microscopes from my home country Sri Lanka and bought some soup ladles in the local supermarket so we could carry out the survey. I also sewed my own mosquito traps using netting material I bought in the market."

Examine mosquitoes to prevent malaria

Entomological surveys are the backbone of malaria prevention measures. Depending on the type of the mosquito, where it breeds, when and where it rests, how it bites and how susceptible it is to insecticides, local authorities can assess the best malaria prevention approaches.
Dr Manel’s surveys have enabled the National Malaria Control Programme to limit yearly indoor residual spraying (IRS) with insecticides to those areas that it has identified as epidemic prone and high risk areas. The Programme has distributed long-lasting insecticide-treated bed nets to people in other malaria risk areas.

These surveys are repeated once a month and local malaria vector control actions adapted accordingly.

"Initially, the malaria programme focused mainly on the people displaced through civil unrest in 2006. The priorities were diagnosis and treatment," says Dr Manel. "Relatively little attention was given to prevention."

**Huge strides in malaria prevention**

With increased political commitment, advances in diagnostic testing and treatment and financial support from the Global Fund to Fight AIDS, Tuberculosis and Malaria, Timor-Leste has made huge strides in the prevention and control of malaria in recent years. Today, all areas where there is a risk of malaria have control and prevention measures in place. All public health facilities are equipped to diagnose and treat the disease.

The ingenuity and perseverance of Dr Manel and her counterparts in the Ministry of Health have paid off: within only 6 years, the number of reported malaria cases in Timor-Leste dropped from 220 cases per 1000 people in 2006 to less than 1 case per 1000 in 2013.

Today the Government is making efforts to reach out to remote communities and train community health volunteers to diagnose malaria, treat uncomplicated cases and refer more complicated ones to the nearest health facility. The volunteers also check whether bed nets have been put in place and help families to mount the nets if needed.

A few months ago, 45-year-old Rita Soares, who lives far away from a health post, developed a fever. A community health worker came and tested her for malaria.

“When it turned out that I had malaria, he gave me the medicine I needed and I was soon feeling better.”
Singing to prevent malaria

*Susuk* Sira *nē’e* – These mosquitoes

*Mai husi nebe* – come from where?

*Susuk* Sira *Nē’e* – these mosquitoes

*Mai husi be foer* – come from stagnant water

*Be foer sira nebe* – stagnant water that is

*Iha ita nia sorin* – in our surroundings

*Lori moras ida* – causing a disease

*Naran moras Malaria* – a disease called malaria

*Mai ita hamotuk* – come together

*Hasoru ni aba* – to combat the disease

*Ho ita nia limpeza* – by cleaning up

Isabel Exposto is passionate about mobilizing the community to prevent malaria with her “Malaria song”. She works as a Ministry of Health CISCA Officer for Health Promotion in Timor-Leste. Isabel is a mother of six and a grandmother of five.
Eliminating malaria in Maldives

Dr Abdul Sattar Yoosuf, Executive Director, International Centre for Environment Development and Operational Research, Maldives

The sun beat down from a cloudless sky on the inland kulhi reflecting its rays from the lagoon’s calm surface as if bouncing off a million floating jewels. The kulhi lay smooth in the calm of a windless morning occupying about five hectares of land space with lush green mangroves lining its outer fringes. The scenic beauty was picture postcard perfect.

This expanse of water found in many of the larger islands of the Maldives archipelago is home to the mangroves in these scattered coral islands. Ecologically, the mangroves are natural embankment of shelter from the monsoon erosions that protect the island. It is also a safe haven to various sea crustaceans, newly hatched fish fry, and a rich mine of marine biodiversity. Some say these water bodies are also natural sinks for excess water accumulations from the heavy precipitation that fall in torrents on these islands during the monsoon period that allows this water to drain naturally without inundating the whole terrain to wash off much of the precious little humus the poor coral soil contains.

But for the teams of health workers visiting these premises, it was not the natural beauty that took them there – year after year. For them it was the place where one of the two vectors of the malaria mosquitoes found in Maldives bred. The brackish water of these sun-warmed bodies was the perfect breeding environment for it.

Grounded in the knee-deep mud of the kulhi and patiently and quietly observing the placid surface of the water in the burning sun was not something the health workers particularly enjoyed. But this was an important part of the national malaria control programme. Larval surveys had always been a major facet of control as this ensured the effectiveness or failure of the comprehensive malaria control programme to curb the mosquito density in the country.

Larval surveys were a tedious task that needed to be done meticulously. And the kulhi was not the only place to search out the breeding; they hatched and whiled away their short larval stage in any stagnant collection of water such as the coconut-
husk soaking pits, wetland marshes, pits dug for agriculture, in drains, drinking water wells, and water jars, roof gutters and even in discarded coconut shells and the like.

Maldives traditionally had two Anopheles vectors of anopheles. One of them was freshwater breeder and inhabited mostly the freshwater wells in the islands. It bred in more exotic places too such as agricultural pits for planting, pot plants that adorned many homes by then, and even in the hollow of discarded coconut shells.

The other was a brackish water breeder found in such places as the mangrove pools and others brackish inland water bodies. The soaking pits for coconut husk fiber needed for the local coir industry were also a regular source of breeding of this vector.

The attempt to eliminate the freshwater breeder was mostly through the introduction of fish to the well. That was a relatively easy to do, but not easy to maintain. Several bouts of continuing diarrhea that swept through the island on and off necessitated the chlorination of the wells, and every such time the fish in the wells would die. To address this, some islands had adopted for the practice of having a fish stock well that they did not chlorinate at all. This way they were able to introduce new fish whenever the chlorination bouts killed off the existing fish in other drinking-water wells.

As for the brackish water breeder, the job was more cumbersome. There had to be regular larval surveys to observe the vector density in such places as mangroves and husk pits. And teams from the malaria control programme went on scheduled visits to check for their prevalence. It entailed meticulous and patient backbreaking work in the hot sun.

It was in the 1970s with the systematic combination of spraying, larval surveys and consistent approaches to fingertip blood filming throughout the country, the regular domiciliary visits for checking breeding in the domestic context and public buildings, and airports, and boat surveys of all the vessels coming to Male’ that elimination was finally possible.

Huge efforts had gone into this programme over the years in the spraying the teams had to do on every inhabited island. DDT was used in the final stages of the programmes as it was advised OK for these final mopping up operations. But in the early days it was of incessant use and whole islands would smell of it for days. The houses, many of them with coconut thatch partitions for walls, would have the marks of white droplets dried on these and undersides of the roofs and even on whatever little furniture they had. Keeping this residue untouched was recommended as it would protect the insides of houses from mosquitoes and so protect their inhabitants from malarial infection transmitted in their bites.

It was the struggle of the earlier days when travel to the islands was by sailing boat, and the delays and difficulties of entering and exiting the island harbours that were either too shallow or too rocky that made the teams’ work that much more arduous. And when work began, the health team had to also bear with the incessant complaints of many who only grudgingly removed their belongings from their households in preparation for the spraying. The work would begin at sunrise and finish at sunset, and then even extend many a time into the night with only kerosene-fuelled hurricane lamps to provide illumination to the otherwise pitch darkness of these islands that had no electricity.
The stream of action that went into screening the island population was not any less burdensome. On regular screening visits by the malaria team, the whole island population would be lined up in the shady beach fronts or in some school yard, or such space, and tables and chairs set up to do an assembly line of action to have every one fingertip blood filmed and presumptive treatment administered to everyone – young and old, men and women.

In Male’, the boat survey of taking fingertip blood smears from all who came to Male’ from the islands as an integral part of the malaria control programme’s active case-detection strategy helped immensely to pinpoint where in the country any fresh disease transmission was beginning. This way, quick action was taken to nip the spread of a fever in the bud.

Ultimately, it was a comprehensive set of tasks that included focal spraying, blood filming for detecting new cases, supervising island office staff for quality of treating and managing existing cases with the WHO recommended procedures and regimen of treatment drugs, checks for larvae in all the wells and the mangroves, doing the night-bite counts, and explaining to the island communities how one contracted malaria, and how they could prevent it, that wiped the disease from the nation.

As the years passed in the service of eliminating malaria, the distended bellies and anaemic eyes of the children became a thing of the past. Mothers had more babies without the heartbreak of miscarriages, fathers had more productive fishing time at sea, and children grew to be healthier, taller, and survived longer — and ultimately aiding the expansion of a healthy life expectancy in the nation.
Protect yourself and your family from malaria

You can get malaria from the bite of an infected mosquito.

Prevent malaria: sleep under insecticide-treated bednets.

Protect yourself: use mosquito repellants.

Get diagnosed early: get tested for malaria if you have high fever.

Get treated: complete your prescribed treatment course.

Vector-borne diseases
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http://www.searo.who.int/entity/world_health_day/2014/en/
Elimination of lymphatic filariasis in Maldives: a success story

Dr P. Jambulingam and Dr K. Krishnamurthy, Vector Control Research Centre, Pondicherry, India

The Republic of Maldives comprises 1153 islands in the Indian Ocean with a total land area of 300 km². Maldives has a population of about a third of a million, ranging from less than 100 in some islands to over 100 000 in the capital, Male’, the only urban area.

Maldives was previously endemic for lymphatic filariasis – commonly known as elephantiasis – a disease that occurs when filarial parasites (Wuchereria bancrofti) are transmitted to humans through mosquitoes. A study carried out in 1951 covering 34 islands in three atolls showed that out of 3827 (26% coverage) individuals screened, 37% were found either infected with Wuchereria bancrofti or with clinical manifestations of lymphatic filariasis. All the 34 islands were endemic and the islands in Suvadiva (southern Maldives) recorded the highest endemicity rate of 43%. Disease prevalence was 19.5% in females and 28.0% in males. Stepwells were reported to be the major breeding source of both the mosquito species that were found to be vectors for transmitting the disease to humans.

But a subsequent survey, carried out in 1969, covering nine islands and five atolls showed that inhabitants of only one atoll (Gaaf Alif) had significant signs of infection. Since 1951, the stepwells had almost all been filled in and fish had been introduced in the other wells during an antimalarial campaign. Disappearance of the disease was then ensured by indoor residual spraying and antilarval measures under an antimalaria programme.
During the visit of the expert team for verification of lymphatic filariasis elimination in 2011 it was noted that sources of mosquito breeding were open ring wells, overhead/rainwater-harvesting synthetic tanks and septic tanks, and that stepwells were no longer present in any of the islands. This could be one reason for many islands not showing any filarial infection. This example from the Maldives can be considered a classic example of disappearance of filariasis, achieved by reduction in mosquitoes by removing their breeding places.

A sample survey carried in 2003 in Laamu atoll covering 14 islands showed that 223 (17.9%) children out of 1246 were found to be positive for antigens for filariasis, but other atolls were negative. Laamu atoll with a population of about 2000 population was therefore identified as endemic for lymphatic filariasis and mass drug administration (MDA) was started in 2004. This elimination programme including evaluation was carried out by the central team attached to the Department of Public Health and five annual rounds were completed by 2008. The reported coverage was 93–100% of the population in different rounds. At the end of fifth round of MDA (2008), none of the 743 children screened from 10 localities was positive for filariasis antigens. The decision to stop MDA was supported by the observation that there was no new cases of infection in the children.

Maldives has also focused attention on increasing mosquito-control activities following the tsunami in December 2004, which affected a number of previously endemic islands.

Although recording of clinical cases of filariasis was continued from 1985, no new clinical case has been reported from any part of the country since 2002. Post-MDA surveillance is in place in the country for monitoring resurgence of infection. Over 700 immigrants from Bangladesh, India, Nepal, Pakistan and Sri Lanka were screened in 24 islands as a part of the post MDA surveillance. It was found that none of them was positive for filarial infection. Maldives is now preparing its dossier for certification of elimination in order to join the list of countries that have successfully achieved elimination of lymphatic filariasis.

References:
Lymphatic filariasis: a mosquito-borne disease

What is lymphatic filariasis? Is it the same as elephantiasis?

Lymphatic filariasis is a mosquito-borne parasitic disease, which is painful and very disfiguring. It is one of the oldest and most neglected diseases in the world.

It is also commonly known as “elephantiasis” because the most recognizable symptom is swelling in one or both legs – which then resemble an elephant’s leg.

What causes this disease?

Lymphatic filariasis is caused by thread-like filarial worms. There are three species of these nematodes (roundworms): Wuchereria bancrofti, Brugia malayi and B. timori. Male worms are about 3–4 centimetres in length, and female worms are longer, measuring 8–10 centimetres. Almost 90% of all filariasis infections are caused by W. bancrofti and most of the remaining by B. malayi. The male and female worms together form “nests” in the human lymphatic system – the network of nodes and vessels that maintain the delicate fluid balance between blood and body tissues.

How is lymphatic filariasis transmitted?

Filariae are transmitted by mosquitoes. In the mosquito, the parasite undergoes different stages while developing, of which only the third stage is infective. When a mosquito carrying the infective parasite bites a human, the parasites are deposited on the person’s skin, from where they enter the body. These then migrate to the lymphatic vessels and develop into adult worms over a period of 6–12 months, causing damage and enlargement of the lymphatic vessels.

The adult filariae live for several years in the human host. During this time, they produce millions of immature microfilariae that circulate in the blood. These microfilariae are then ingested by mosquitoes when they bite an infected person. The larval forms further develop inside the mosquito before becoming infectious to man. Thus, a cycle of transmission is established.

How common is the disease?

Globally, more than 1.4 billion people in 83 countries live in areas endemic for lymphatic filariasis, which means they are at risk. Among those, 873 million reside in the South-East Asia Region.

If so many people are at risk, why are so few cases reported?

There are an estimated 120 million cases of lymphatic filariasis worldwide, with about 40 million people disfigured and incapacitated by the disease. In the past, lymphatic filariasis has been largely underestimated as diagnostic and investigative tools were poor. It is also a disease of poverty, meaning it primarily affects poor communities in developing countries, often in remote, rural areas, with low visibility or political voice. The disease itself is hidden from view as the principal clinical manifestations are “covered up” because of personal shame and stigma.

This in turn has prevented a full understanding of both the scope and impact of the disease, including the exact economic and social burden on the affected communities. As the disease is not fatal, it ranks low on the health priority agenda, and the disability it causes is greatly underestimated.
How do these worms make us ill, and what are the symptoms?

Filarial infection can cause a variety of clinical manifestations. These include:

- acute local inflammation, involving the skin, lymph nodes and lymphatic vessels and often accompanied by chronic lymphoedema (swelling of the lymph nodes).
- painful swelling of the limbs due to fluid retention.
- genital disease (collection of fluid and swelling of the scrotum and penis), accompanied by high fever.

But the vast majority of infected people do not have obvious symptoms, although virtually all of them have subclinical lymphatic damage. As many as 40% have kidney damage, with proteinuria and haematuria (protein and blood in the urine, which is not normally found in healthy people).

Is there any treatment, or a drug that can kill these worms?

Albendazole along with diethylcarbamazine citrate (DEC) is given in combination as mass drug administration (MDA).

There are two parts to the treatment strategy.

- Treatment of the community to progressively reduce and interrupt transmission.
- Treatment of the patients, to prevent and alleviate disabilities due to lymphatic filariasis.

What is mass drug administration?

WHO recommends a two-drug regimen of DEC + albendazole given through a mass drug administration (MDA) campaign to the entire endemic population once every year for 4 and 6 years.

To interrupt transmission in an endemic community, the microfilarial load must be reduced below that necessary to sustain transmission, and for a period long enough to exceed the fecund (fertile) life span of adult worms. This is estimated to be between 4 and 6 years, during which if MF are absent or less than 1% of the population. This only happens if a large part of the population (over 80%) takes the drugs. That is why it is very important to achieve high coverage of MDA in all endemic and at-risk communities.
What else can we do to control lymphatic filariasis?

WHO recommends that whenever possible and affordable, vector-control techniques should be used to supplement MDA activities. This means avoiding mosquito bites in lymphatic filariasis-endemic areas through personal protective measures – such as using mosquito repellents, bednets and insecticides. Mosquitoes often breed in stagnating polluted water bodies, such as blocked drains and sewers, and hence good sanitation is essential to reduce mosquito breeding places. Integrated vector management and personal protection measures are useful complements to MDA.

What can we do for people who already have disabilities as a result of lymphatic filariasis?

The common disabilities are lymphoedema, particularly of extremities (hands and feet) in both males and females, and hydrocele (scrotal swelling) in males. Affected patients are empowered to effectively manage lymphoedema through simple but rigorous hygiene techniques. Avoidance of secondary bacterial infection is essential, and preventive antibiotics may be indicated for some patients.

However, the cornerstone of management is hygiene and adequate skin care. The public health goal of lymphoedema management is home-based self-care, and this requires strong health education, support to patients and family members or any informal caregivers, and referral networks for acutely infected or complicated patients. Sometimes, the already-damaged vessels are irreversible. For patients with hydroceles, the principal management remains surgery (hydrocelectomy).

What can I do at the individual level to prevent lymphatic filariasis infection?

The best way to prevent lymphatic filariasis is to avoid mosquito bites. The mosquitoes that carry the microscopic worms usually bite between the hours of dusk and dawn. If you live in an area with lymphatic filariasis:

- sleep under a mosquito net at night
- wear long sleeves and trousers
- use mosquito repellent on exposed skin between dusk and dawn.

Can I get lymphatic filariasis from a single mosquito bite?

No. Many mosquito bites over several months to years are needed to get lymphatic filariasis. People living for a long time in tropical or sub-tropical areas where the disease is common are at the greatest risk for infection. Short-term tourists are at a very low risk.

What progress has been made in eliminating lymphatic filariasis from the South-East Asia Region?

Considerable progress has been made in eliminating lymphatic filariasis in the Region. All the countries have finished mapping lymphatic filariasis-endemic areas as the initial step in MDA, and most have started MDA since early 2000. Among 9 endemic countries in the WHO South-East Asia Region, Maldives, Sri Lanka and Thailand have both stopped MDA and are now in the process of verification of lymphatic filariasis elimination.

However, a lot more remains to be done if we want to achieve the target by 2020. The principal challenges include finding the necessary financial resources for programme implementation (some countries have had to interrupt MDAs due to lack of funds), undertaking operational research to fix gaps in implementation, utilizing strategies for vector control methods, and lastly, identifying the impact of programme.
Bangladesh must eliminate kala-azar by 2015

Dr Poonam Khetrapal Singh, Regional Director, WHO South-East Asia Region

Most people have never heard of kala-azar or of visceral leishmaniasis. Yet this life-threatening disease is re-emerging as a public health threat in Bangladesh and neighbouring India and Nepal. This debilitating disease caused by a parasite and spread by sandflies affects the poorest Bangladeshis and has a huge socioeconomic cost for them.

The good news is that kala-azar is preventable and treatable. The disease almost disappeared during the ‘Malaria Eradication Programme’ (1961–1970). In 1981, eight upazila reported the disease. At present it is reported in 139 upazila in 45 districts of Bangladesh. An estimated 200 000 to 400 000 new cases of visceral leishmaniasis occur every year globally. The annual death toll from the disease is estimated at around 20 000 to 40 000, which is surpassed only by malaria among the parasitic diseases.

The poorest of the poor are affected by this disease in our communities in remote, rural areas. Associated with malnutrition, poor housing and illiteracy, kala-azar prolongs the cycle of poverty as people cannot afford treatment and therefore cannot work. This disease is often fatal if left untreated.

Kala-azar can be prevented through available technologies, political commitment and community participation. Bangladesh, India and Nepal signed a memorandum of understanding in 2005 to eliminate kala-azar.

Despite the difficulties in controlling this disease globally, there are several factors specific to the Indian subcontinent that make elimination feasible. Humans are the only reservoir and sandflies the only known vector for the parasite, so if we can interrupt transmission in humans, it can be eliminated.
The sandflies that transmit the disease normally breed in moist soil, caves, cracks in the mud walls, or in the burrows of small rodents. That is why in some villages, where houses are in close proximity to cattle or cattle-sheds they are more at risk.

Several breakthroughs in the treatment of visceral leishmaniasis have been reported over the past decade. The current control strategies rely on early diagnosis and treatment of the affected people and controlling the vector – the sandfly.

New and more effective diagnostic tests and drugs are available and can be used in the field. Most importantly, there is a strong political commitment and intercountry collaboration to stop the disease, making kala-azar elimination a “low hanging fruit”.

Bangladesh can eliminate kala-azar by focusing on early diagnosis and ensuring the full course of treatment. Effective disease surveillance will play an important part in this elimination effort. Elimination cannot be achieved without community participation. Educating and empowering communities to take ownership of vector control in their houses and communities is the cornerstone of a sustainable elimination programme.

It is now well recognized that prevention and control of vector-borne diseases warrant a comprehensive, multisectoral and all-encompassing response. This requires developing and implementing strategies, interventions and technologies to modify these environmental risk factors to substantially prevent and reduce the disease burden. Integrated vector management (IVM) is one such rational decision-making process approach. It advocates social mobilization, collaboration with other sectors, integration of nonchemical and chemical vector control methods that are amalgamated into other disease control programmes, and building national capacity.

Bangladesh has demonstrated political will to improve the health status of its citizens in several areas. The country must capitalize on the resources and commitment of partners and use them to eliminate kala-azar in the near future.
Kala-azar: a disease transmitted by sandflies

What is kala-azar or visceral leishmaniasis (VL)?

Visceral leishmaniasis (VL), also known as kala-azar, is a life-threatening disease caused by the *Leishmania donovani* parasite.

The signs and symptoms of infection with this parasite include anaemia (deficiency in the number or quality of red blood cells), fever, enlarged liver, enlarged spleen and significant weight loss. This disease is often fatal if left untreated. The disease is spread through female sandflies.

Leishmaniasis can occur in three different forms. Visceral leishmaniasis is the most serious form of the disease and causes death in the majority of its victims if left for untreated long time.

Where is visceral leishmaniasis prevalent in South-East Asia?

Bangladesh, India and Nepal harbour an estimated 67% of the global visceral leishmaniasis disease burden. In India, most cases occur in the state of Bihar, but other states such as Jharkhand, Uttar Pradesh and West Bengal also report cases. Recently, visceral leishmaniasis has also been reported from Bhutan and Thailand. The visceral leishmaniasis cases are usually concentrated in clear geographical areas – in certain districts or villages. However, population movement means that these boundaries are not always clearly defined.

How does a person get visceral leishmaniasis?

Humans are infected via the bite of sandflies which carry the *Leishmania* parasite inside them. Only female flies can transmit the disease. A single bite from an infected sandfly can inject enough parasites into the bloodstream to infect a human.

What are the signs and symptoms of visceral leishmaniasis?

Patients of visceral leishmaniasis suffer from fever, which can increase gradually or suddenly. The fever is persistent and irregular, often with two daily peaks, and alternating periods of no fever or low-grade fever. Other symptoms include fatigue, weakness, loss of appetite, significant weight loss, and enlarged lymph nodes/glands, enlarge liver and spleen. As the disease advances, the spleen size increases, which may cause abdominal distension and pain.

Post-kala-azar dermal lesion (hyper-pigmentation of skin) may occur after apparent cure of the systemic disease, although this is now very uncommon.

The clinical features of visceral leishmaniasis are not specific and can be easily mistaken for any other common illness that comes with fever.

Does infection or getting bitten by the sandflies always lead to illness?

No. Infection with *Leishmania* does not always lead to clinical illness, and there are infected people without any symptoms at all. For each sick person, there can be between 3 and 8 people who do not appear ill. The risk factors for developing illness include malnutrition, or if the person has any other disease that reduces immunity, such as HIV/AIDS.

How long after being infected does the disease develop?

The period between sandfly bite and appearance of symptoms is usually 2 and 6 months, but symptoms can appear as early as 10 days after the bite, or sometimes take years.

What are the complications of visceral leishmaniasis? Can patients die?

Visceral leishmaniasis can eventually lead to death unless treated. Visceral leishmaniasis symptoms often persist for several weeks to months, and weaken the patient so other infections such as pneumonia, diarrhoea or tuberculosis can occur.
and mask the original symptoms. Patients can die either due to these coinfections, massive bleeding or severe anaemia.

After treatment, 5–10% of patients can also develop post-kala-azar dermal leishmaniasis (PKDL), a skin lesion. It usually appears between 1 and 3 years after the patient was initially cured.

Where do the sandflies that transmit the disease live?

The sandflies that transmit the disease normally breed in forest areas, caves, cracks in the mud walls, or in the burrows of small rodents. That is why in some villages, where houses are in close proximity to cattle or cattle-sheds, there is a high probability of having sandflies around.

What are important features of sandfly bites?

People might not realize that sandflies are present because:

- they do not make any noise
- they are small – only about one third the size of mosquitoes, or even smaller
- their bites are painless and might not be noticed.

Sandflies usually are most active during twilight, evening, and from dusk to dawn. But although they are less active during the day, they may bite if they are disturbed (for example, if a person brushes up against the trunk of a tree or other site where they are resting).

What is the treatment for visceral leishmaniasis? Is it curable?

Yes, visceral leishmaniasis is curable with proper treatment. Visceral leishmaniasis is difficult to treat mainly because most of the drugs have to be given through injection, requiring hospitalization and close monitoring. LAmB (liposomal amphotericin B) is now the treatment of choice.

Is there any vaccine for visceral leishmaniasis?

No, not yet. Anti-leishmanial vaccines are still under development.

What are the control strategies for visceral leishmaniasis?

The current control strategies rely on reservoir and vector control – and, of course, early diagnosis and treatment of cases. When the burden of disease is high, active case finding can also be carried out.

Can we kill sandflies with insecticide? What are the methods for vector control that are used for visceral leishmaniasis?

Sandflies are susceptible to the same insecticides as the malaria vector, and residual insecticide spraying of houses and animal shelters has been shown to be successful in India. Another method is environmental control, such as plastering cracks in the house wall and moving away from animal shelters.

What about using insecticide-treated nets?

The use of insecticide-impregnated/treated bednets could also prevent visceral leishmaniasis as well as other vector-borne diseases such as malaria or Japanese encephalitis. However, there is limited evidence that bednets provide protection against visceral leishmaniasis in particular, as effectiveness of the bednets depends on the sleeping habits of the population and the biting habits of the local vectors.

How critical is finding and treating infected patients?

Visceral leishmaniasis can kill if it is left untreated. People who are not treated can also act as a reservoir for parasites and therefore contribute to the spread of the disease. Similarly, post kala-azar dermal leishmaniasis patients are likely to be highly infectious because large numbers of parasites are present in the skin lesions. Therefore, it is critical to identify and treat infected patients.
Dengue – symptoms, treatment, prevention and control

Dengue is now the world’s fastest growing vector-borne disease, with a 30-fold increase in disease incidence over the past 50 years. Outbreaks of dengue fever have now been reported from all countries in WHO’s South-East Asia Region except Democratic People’s Republic of Korea.

Characteristics

Dengue fever is a severe, flu-like illness that affects infants, young children and adults. Dengue should be suspected when a high fever (40°C/104°F) is accompanied by two of the following symptoms: severe headache, pain behind the eyes, muscle and joint pains, nausea, vomiting, swollen glands or rash. Symptoms usually last for 2–7 days, after an incubation period of 4–10 days after the bite from an infected mosquito.

Severe dengue is a potentially deadly complication due to plasma leaking, fluid accumulation, respiratory distress, severe bleeding, or organ impairment. Warning signs occur 3–7 days after the first symptoms in conjunction with a decrease in temperature (below 38°C/100°F) and include: severe abdominal pain, persistent vomiting, rapid breathing, bleeding gums, fatigue, restlessness, blood in vomit. The next 24–48 hours of the critical stage can be lethal; proper medical care is needed to avoid complications and risk of death.

“Early clinical diagnosis, careful follow up, early detection of plasma leakage with proper monitoring and intravenous fluid administration, and management of common complications are critical to reducing deaths due to dengue.”

“This is especially so for high-risk populations such as infants and the elderly, and patients who have other diseases, or are obese or pregnant or in those who have bleeding or altered consciousness.”

“Good teamwork between doctors and nurses and close monitoring are important in dengue case management.”

Professor Siripen Kalayanarooj, Director, WHO Collaborating Centre for Case Management of Dengue/DHF/DSS, Queen Sirikit National Institute of Child Health (QSNICH), Bangkok, Thailand.

Treatment

For severe dengue, medical care by physicians and nurses experienced with the effects and progression of the disease can save lives – decreasing mortality rates from more than 20% to less than 1%. Maintenance of the patient’s body fluid volume is critical to severe dengue care.

Immunization

There is no vaccine to protect against dengue. Developing a vaccine against dengue/severe dengue has been challenging although there has
been recent progress in vaccine development. Several candidate vaccines are in various phases of trials.

**Prevention and control**

At present, the only method to control or prevent the transmission of dengue virus is to combat vector mosquitoes through:

- preventing mosquitoes from accessing egg-laying habitats by environmental management and modification;
- disposing of solid waste properly and removing artificial man-made habitats;
- covering, emptying and cleaning of domestic water storage containers on a weekly basis;
- applying appropriate insecticides to water storage outdoor containers;
- using of personal household protection such as window screens, long-sleeved clothes, insecticide treated materials, coils and vaporizers;
- improving community participation and mobilization for sustained vector control;
- applying insecticides as space spraying during outbreaks as one of the emergency vector control measures;
- active monitoring and surveillance of vectors should be carried out to determine effectiveness of control interventions.
Stop dengue now!

You can get dengue through the bite of an infected mosquito. The dengue mosquito breeds in clean, stored, uncovered water.

- Remove stagnant water from your surroundings
- Empty and clean water storage containers weekly
- Wear long-sleeved, full-length clothing and use mosquito repellent
- Seek early treatment if you have high fever, nausea and body ache.

Prevent | Control

Vector-borne diseases
- Chikungunya
- Dengue
- Japanese encephalitis
- Kele-azar
- Lymphatic filariasis
- Malaria
- Schistosomiasis

http://www.searo.who.int/entity/world_health_day/2014/en/