Snakebite Awareness Training
Part 2: Lesson 2 - What Is A Snake?

As you begin this lesson, ask the participants what they think they know about snakes. Do snakes have bones? Can they hear? Can the tongue sting you? Let them answer freely without correction, so that you can direct their learning to address misconceptions they have about snakes during the lesson.

Let's start this training with learning about snakes and their characteristics.

Why is this important? - it is important to understand the characteristics of snakes and their behaviors so that you can know when you might have an encounter with a snake and why. Also, so that we don't just kill every snake we see, we need to understand why they are important in nature so we will kill a snake only when it is a threat to yourself or your family.

<u>What is a snake?</u>

Snakes all have a tubular body, and they do have bones. Snakes are different from other reptiles in that they have no legs. Without legs, they employ a variety of different movement styles. The one that most of us recognize is the S-shaped, side-to-side movement [***demonstrate this with your hands***] that a snake uses to wind its way through the environment. However, if you have ever watched a puff adder move, it looks like a caterpillar or worm inching its way forward.

Because they have no limbs to hold onto their food, snakes have curved teeth that are designed for grasping and holding onto food. They can expand their jaws really wide, and use their lower jaws to pull their prey into their mouths.

Snakes have other sensory organs that help them understand their surroundings. Snakes do not have external ears and no vocal cords to make sounds - except that they can hiss. However, ***they can sense vibrations in the ground***. They have a forked tongue that picks up scent particles around them which can be used to find prey and mates. Some have heat-sensing pits that allow them to find warm blooded prey at night. Snakes also have good vision, and ***their pupils can sometimes tell us whether they are active during the day or at night***. People often think that snakes are staring at them, but that is because they have no eyelids to blink.

Why is it important to know these things? Because all of these sensory organs are used by a snake to detect you when you are coming toward them, and if you understand that, you know that they will sense you and move away as long as they have a route to do so. They would rather flee than fight.

You will soon learn that getting an idea of the length and thickness of a snake is useful for its identification. Some snakes are much heavier and thicker than others. Heavy snakes include the rock python and the larger vipers, such as the puff adder and rhinoceros viper. The larger cobras and mambas are thick snakes as well, although not as thick as the vipers. Many snakes, such as green snakes and sand snakes, are about as thick as one of your fingers.

Snakes also vary in length. The longest snake in Africa is the rock python, which can measure 4-6 m in length - it is also the heaviest

snake. The longest venomous snake in Africa is the black mamba which can be up to 4 m in length. The smallest snake in Africa is the Brahiminy blind snake, which is only 2-6 inches long.

Snakes are covered with scales made of the same materials as your fingernails. These help to protect the body and keep it from drying out. Scales can either be smooth or keeled. Keeled scales have a ridge down the center of each scale. ***If you can see the type of scales a snake has, it will help you to identify it.***

Shedding

Snakes grow throughout their lifetime, but their skins do not grow with them. So periodically, a snake has to shed its skin because the body outgrew it. During this time the skin gets dry, they turn dull in color, the eyes become cloudy, and they stop eating. ***Because they can't see very well during this time, they can become nervous and feel threatened more easily.*** When it is time to shed, they rub up against a rough object to pull the skin off of their body inside out.

Basking

When you are outdoors, you might encounter a snake in a sunny spot or on a warm rock. Like all reptiles, snakes are unable to maintain or regulate their own body heat, so their body temperature is the same as their external environment. So when it gets too cold, a snake will move into a sunny spot to warm up its body. This is called ***basking***. When snakes need to cool off, they find a shady spot or a burrow where they can lower their body temperature.

This snake is increasing its body temperature by laying on a warm rock in the sunshine. Photo courtesy of MattysFlicks under the Creative Commons Attribution 2.0 Generic license.

Where do snakes live?

Why is it important to know where snakes live? If you know where snakes live, then you know the kinds of dangers that might be present when you go there, and it might make it easier to identify a dangerous snake if you are bitten.

Some snakes spend most of their time ***in trees***. Examples of these include the green mamba, boomslang, harmless green snakes, bush vipers, and tree snakes.

Green bush vipers spend their time in trees (photo courtesy of Matt Muir under the Creative Commons Attribution-Share Alike 4.0 International license without changes.

Other snakes like to spend much of their time ***on the ground*** in forests, savanna, or deserts. Examples of snakes that live on the ground include carpet vipers and desert horned vipers, puff adders, Gaboon vipers, and rhombic night adders. Forest cobras spend much of their time on the ground, but are graceful climbers and also good swimmers, so they might be found in other habitats. Black mambas are also equally at home on the ground or in trees.

Snakes can also live ***under the ground*** in the soil or in burrows. Examples include the burrowing asps (stiletto snakes), blind snakes, and worm snakes. These snakes usually have small eyes as compared to other snakes.

Lineolate blind snake (photo used with permission from Stephen Spawls).

Some snakes live ***in or near water***. Examples include water snakes and marsh snakes. In some locations, forest cobras are considered to be semi-aquatic as they spend much of their time around water.

Some snakes live ***in sandy desert*** environments. The desert horned viper and carpet viper are two examples.

Carpet viper or saw-scaled viper. Photo used with permission from Stephen Spawls.

It is important to note that there are many kinds of snakes throughout Kenya, but they are not all found everywhere in Kenya - some are found widely across Kenya and others are isolated to small sections of Kenya. For example, the green mamba is only found along the east coast. If you see a green snake in other parts of the country, it is likely to be a harmless green snake, or perhaps a dangerous boomslang, but not a green mamba.

What do snakes eat? And who eats them?

Snakes are known to eat rodents and other small mammals, fish, frogs, lizards, other snakes, and birds. The African rock python is capable of eating animals the size of a small antelope. Some snakes, like the rhombic egg eater, eat bird eggs. When they are young, some snakes feed on insects.

Snakes are eaten by leopards, hyenas, and other carnivores; other snakes; large lizards (Nile and savanna monitors); crocodiles; large fish; some of the larger frogs, and predatory birds (snake eagle, secretary bird). (See photo below courtesy of Charles J. Sharp under the license Creative Commons Attribution-Share Alike 4.0)

Black-chested snake eagle eating snake

Hunting

Some snakes are active hunters and move around looking for food. Snakes that use this type of hunting are generally faster moving, such as the green snakes, boomslang, and some cobras. Other

snakes tend to find a spot to coil up and then wait for unsuspecting prey to walk by before striking. These are known as ***ambush predators***. An example ambush predator is the puff adder. A puff adder sits by a trail waiting for an animal to come along that it can eat. If you pass by too close to where they are waiting, they might bite you.

Activity Periods

It is important to know when a snake is most active to understand when you might have an encounter. Some snakes are more active during the day; we say they are diurnal. These snakes tend to have round pupils. On the other hand, some snakes are nocturnal - they are more active at night and many of them have vertical pupils. Some, like the forest cobra, can be active at any time of day.

Snakes also tend to be more active during the rainy season, or at night after a good rain. They can also be active during mating season as they try to find a mate.

Reproduction

Snakes breed at various times in the tropics, but in Kenya it is generally a month or two before the start of the wet season. Cobras, mambas, boomslangs, twig snakes, night adders, tree snakes, carpet vipers, and many harmless snakes lay eggs, while puff adders, Gaboon vipers, and many other vipers tend to give birth to live young.

During the mating season, some cobra and mamba males “fight” over the right to breed with a female. The two males twist around each other, but do not try to bite each other. It is more like a dance or wrestling competition to see who can outdo the other. The winning male gets to mate with the female.

Why are snakes important in nature and to humans?

Snakes play an important role in our ecosystems by controlling the populations of some animals, including rodents. Rodents are carriers of diseases and also get into our food supplies. In some ecosystems, the role of snakes can be so important that removing them causes problems for the entire ecosystem. **A good snake to have around your house for rodent control is the brown house snake** (see below). They are harmless to humans and cannot kill you. There is no need to kill this snake - just put it in a bucket and move it to an area away from your house.

Brown house snake. Photo used with permission of Stephen Spawls.

Snakes are important to people, too. Besides controlling pest populations, the chemicals in the venom of some snakes are useful as medicines. For example, snake venom has been used to produce medicines that thin your blood, which is important if you have some types of heart conditions.

Threats

While this training manual is about saving human lives from snakebite, we should also acknowledge that humans have killed a lot of snakes, whether intentionally or accidentally. Humans have an innate fear of snakes, and will kill them whether harmless or not. People driving on roads will often swerve on purpose just to run over a snake. However, this fear can be changed if people take the time to learn about snakes like you are!

In Kenya, perhaps the biggest threats to snakes include:

- Loss of snake habitat (destruction) from expanding human populations, agriculture, and cutting forests
- Breaking snake habitat up into small pieces (fragmentation)
- Making habitat less suitable for snakes (degradation)
- Introduction of invasive species and domestic animals that eat snakes and snake eggs
- Snake diseases spread by humans
- Harvesting of snakes for food, skins, and pets
- Snakes killed accidentally or on purpose by vehicles on roads
- Snakes killed by people out of fear

Conservation

Because snakes play an important role in the function of our ecosystem - the ecosystem that supports our lives, it is important to conserve and preserve snake populations and the habitats where they live. Here are some important steps we should take toward snake conservation:

- Learn more about snakes and the habitats in which they live as part of your community; learn how to tell the difference between the most dangerous snakes from those which are harmless

- Teach your children to have a healthy respect for snakes and kill them only when necessary to protect yourself or your family

- Do your best not to kill non-venomous snakes in your home and compound, and only kill the venomous snakes when they are a threat to you or your family.

- Work together with your community to protect the last remaining habitats for snakes and other animals before they are gone.

Avoiding Snake Encounters With Our New Knowledge

So why do we need to know all of this information about snakes? How does this prevent us from having a deadly encounter with a snake? Consider these points:

1. If we know snakes have fragile rib bones, we can learn to be more cautious about stepping on them.
2. We can keep our distance when we see a shedding snake, knowing that it is more vulnerable and perhaps aggressive during that time
3. We can use the knowledge that snakes are sensitive to vibrations to walk with heavy footsteps when out on a trail or in the bush - this might make them move away from us
4. If we know when snakes are active (day or night, wet season/dry season) we can be more cautious during those times and take actions to avoid them during those periods.
5. If we know that some snakes, like puff adders, conceal themselves along a path where prey is likely to travel (they are ambush predators), then we can be very observant when walking in places where they might be concealed (tall grasses), and use a stick to probe the ground in front and alongside us.
6. If we know snakes are often found in certain types of habitats, we can be more aware and practice good prevention skill when in those habitats.
7. On hot days, we can be particularly careful in shady areas, because snakes may go there to cool down after basking in the sun
8. Because we know snake habitat is shrinking, we can understand that snakes may be driven toward human settlements by human activities and be observant as we carry out our daily activities in those settlements.
9. We can work with our communities to protect snake habitat (for snakes and other wildlife) so they are less likely to move into human settlements.

Review Questions:

Try incorporating these into some of the assessment activities provided in the lesson “Learning Activities” or just ask the participants to answer these.

1. What tools do snakes use to sense their environment? How does that help you avoid snakebite?
2. What is the largest non-venomous snake in Kenya? The largest venomous snake?
3. How do snakes control their body temperature? Why might knowing that prevent a dangerous encounter with a snake?
4. What are some of the places that snakes live? How might being aware of these places help you avoid snakebite?
5. How do snakes act when they are shedding? Why is that important for you to know?
6. What do snakes eat? Who eats them?
7. Why are snakes important in nature?
8. What are some ways that humans threaten snakes?
9. What can we do to conserve snakes?