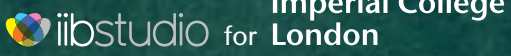

Infographics by IIB Studio for Imperial College London / Dr Simon Pooley
Design by Michele Bush

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DON'T GET EATEN BY A CROCODILE

in South Africa or Swaziland

SIMON POOLEY

contents

Introduction

Because crocodile attacks on humans are not a major problem for countries or provinces, little time or money is spent trying to prevent them. However, for the victims, crocodile attacks can be devastating. People are killed or disabled, bringing grief, fear and in rural areas also poverty to them, their families and communities. Crocodiles may be killed in revenge. Wildlife conservation authorities and local people may have serious disagreements about what to do about such attacks. This guide aims to help reduce these problems. To do this, we are collecting long-term information on croc attacks. So far, this guide includes information from reports on 96 crocodile attacks involving 101 people in South Africa and Swaziland from 1984–2014. We have 800+ attack records for Nile crocodiles across Africa, included on our database and website **CrocBITE (http://www.crocodile-attack.info/).**

How this guide works

1. This guide first introduces the bigger picture of human and crocodile interactions in Africa.

2. The guide next presents a summary of what we know so far about attacks in the region

3. It shows you where and when crocodile attacks have been happening in your region. Crocodiles (like humans) are influenced by environmental factors like rainfall, water levels and temperature. We explore which of these might influence why attacks occur seasonally.

4. Next the guide shows you to whom crocodile attacks have been happening, offering profiles of victims by age group, gender (male or female), and activity (what people were doing when they were attacked).

5. There are four case studies of attacks from your region.

6. The guide explores some Nile crocodile biology and behaviour to explain why crocodiles are such brilliant predators and why it is so important to be careful in places where crocodiles live. We look at what sizes of crocodiles have been involved in attacks, and what happened to them following the attacks.

7. There is advice on how to avoid crocodile attacks, and what to do if you get bitten.

8. The guide concludes with a croc attack report form for you to use. This form also summarises the questions we need to answer so we can better understand crocodile attacks.

Humans and Nile crocodiles in Africa: the bigger picture

Crocodiles and their ancestors, and we humans and our ancestors, have lived alongside each other in Africa for millions of years. One ancient crocodile was even named *Crocodylus anthropophagus*, which means human-eating crocodile, because some of the fossilised bones of our ancestors found at Olduvai Gorge in Tanzania show its bite marks. With their big brains and their weapons, our African ancestors became the top predators on land, but for the longest time, crocodiles were still the top predators in the waterways. Then, in the second half of the twentieth century, humans began to hunt Nile crocodiles (*Crocodylus niloticus*) in all the places where they used to be safe. (African slender-snouted crocs are seldom hunted as far as we know, and Dwarf Crocodiles are hunted for meat, but not commercially for skins.) Following World War Two, humans had lots of guns, and boats with outboard motors, so they could find crocodiles in

remote swamps. They could kill them, skin them, salt the skins and transport them to the tanning factories before they rotted. The tanning factories turned the skins into leather and millions of skins were sold to the fashion industry to make handbags, shoes, wristwatches and suitcases. By the 1960s even some of the hunters began to worry that there weren't enough big crocodiles left. South Africa was one of the first African countries to try to protect its crocodiles, and in 1971 Tony (A.C.) Pooley became a founder member of the International Union for the Conservation of Nature's (IUCN) Crocodile Specialist Group.

Today, the trade in crocodile skins is controlled in most African countries, and the crocodile skin industry gets most of their Nile crocodile skins from crocodile farms in countries like Ethiopia, South Africa, Zambia and Zimbabwe. In some countries, the eggs and sometimes 'problem' animals can be harvested from the wild, so long as wild populations are not threatened.

Crocodiles bring in money for local economies through the sale of skins, meat, and as a tourist attraction. In the wild, they play an important role in the ecosystems they live in, at different ages eating a large range of creatures from insects and crabs to large predatory fish like barbel (catfish). Crocodiles also eat dead animals and fish which would otherwise rot and pollute the waterways we share with them.

The problem now is that in some areas where crocodiles are protected, Nile crocodiles (the only species found in South Africa and Swaziland) have recovered, so there are plenty of them and they are growing larger. They are living in areas where more and more people are settling. Scientists think that large parts of Africa will get hotter and drier as the Earth's climate changes, and people are moving closer to water. Many people depend on the rivers and lakes that crocodiles live in for water for drinking, washing and catching food. Rivers are being dammed, new storage dams and canals are being built. Crocodiles are being forced out of their normal living places (habitats), either by human activities or because there are too many other crocodiles.

Crocodiles are also returning to areas where crocodiles used to live before they were hunted out, and people have forgotten how to live safely alongside them. Crocodiles are popping up where people don't expect them to.

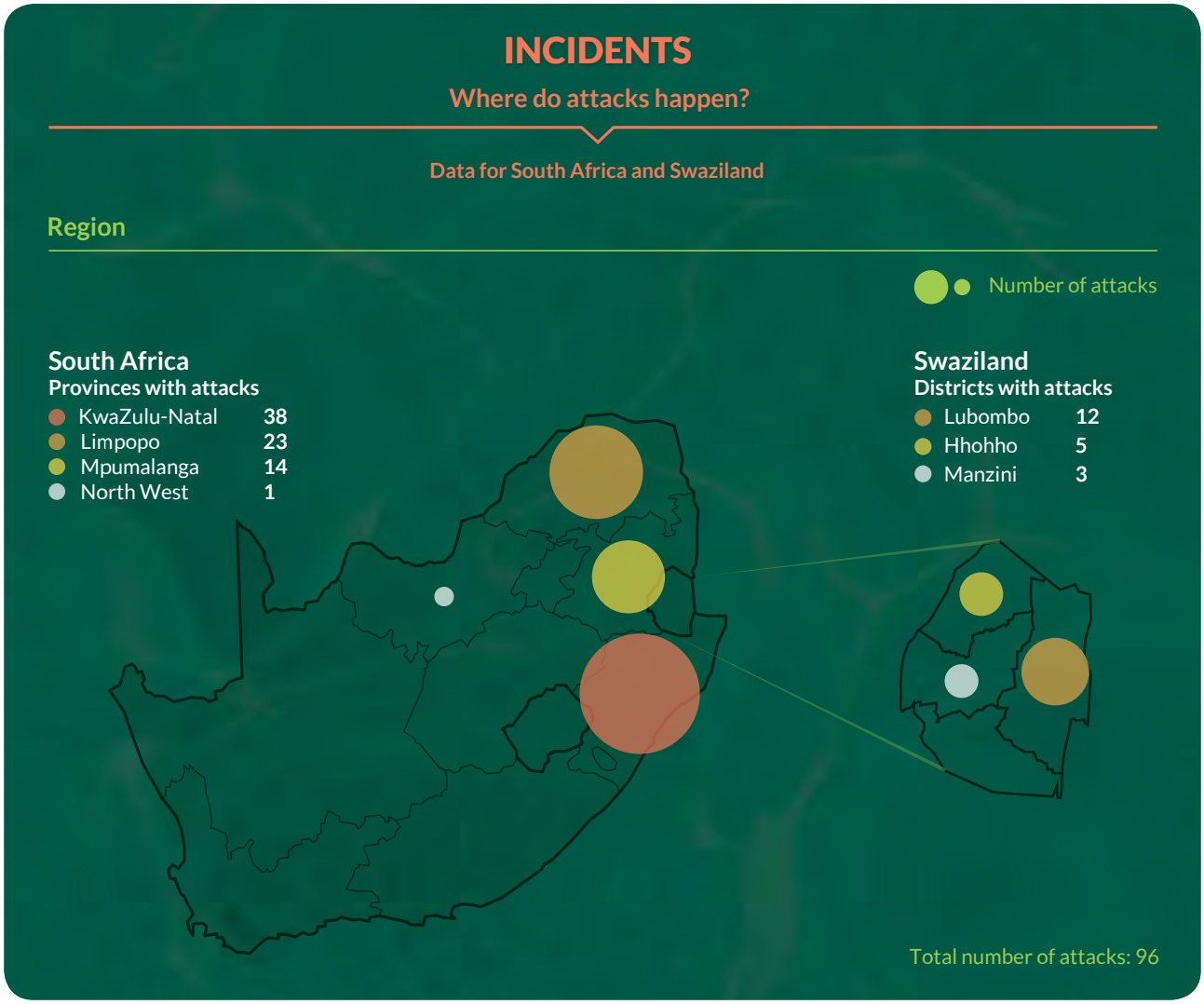
The result of all this is that there are quite a lot of crocodile attacks, on humans and on their animals. The year 2014 was a record year for crocodile attacks in South Africa (I have records of 9 attacks). The IUCN Crocodile Specialist Group estimates that there are more than 300 attacks per year in Africa. In our CrocBITE database we have historical records (dating back to 1892) of more than 800 attacks in 27 African countries (including Madagascar). Of course, many more people are hurt in car accidents or from diseases like malaria than are hurt by crocodiles, but because people are much more frightened of crocodiles, a crocodile attack always makes for sensational news. In many cases, a crocodile (not always the right crocodile!) will be killed after an attack.

We believe that by learning more about the kinds of activities and conditions that bring crocodiles and humans together in the water in the same places, at the same times, we can better avoid crocodile attacks – and attacks on crocodiles. It is difficult to collect this kind of information, and we will need your input to succeed. **Help us to save lives: human and crocodilian!**

CROC ATTACK

Crocodile attacks in South Africa and Swaziland, 1984 - 2014

This map summarises in which provinces and districts most of the attacks have happened in your region. It is based on all the recorded attacks (96, as shown bottom right of the picture) we have for the period of time 1984-2014. It is important to remember that not all attacks are reported, and there will almost certainly have been more attacks than we know about. We'd love to hear about any you know about.



Summary findings on croc attacks in South Africa & Swaziland

Where: The most dangerous water bodies were rivers or streams (74% of attacks), but in recent times there have been many attacks in dams (14% overall).

When: In South Africa and Swaziland, most attacks happen from October to April and especially from November to February.

Victims: The year 2014 was a record year for (reported) crocodile attacks in South Africa (9 attacks), but no-one seems to have noticed!
In the period 1984-2014, 66% of all attacks were on males. Of these, 54% were attacks on boys. Forty-two percent of attacks on females were on girls. The ten-year age group with the highest attack rate is children aged 10–19 years (45% of all attacks where victim age is known). Next highest is adults aged 20-29 (21%).

Activities: Most attacks were made on people while they were swimming or bathing (40%). The next highest category was fishing (25%). Most males were attacked while swimming and bathing, followed by fishing. However, more females were attacked while crossing or doing domestic chores (eg washing clothes or collecting water), than while fishing.

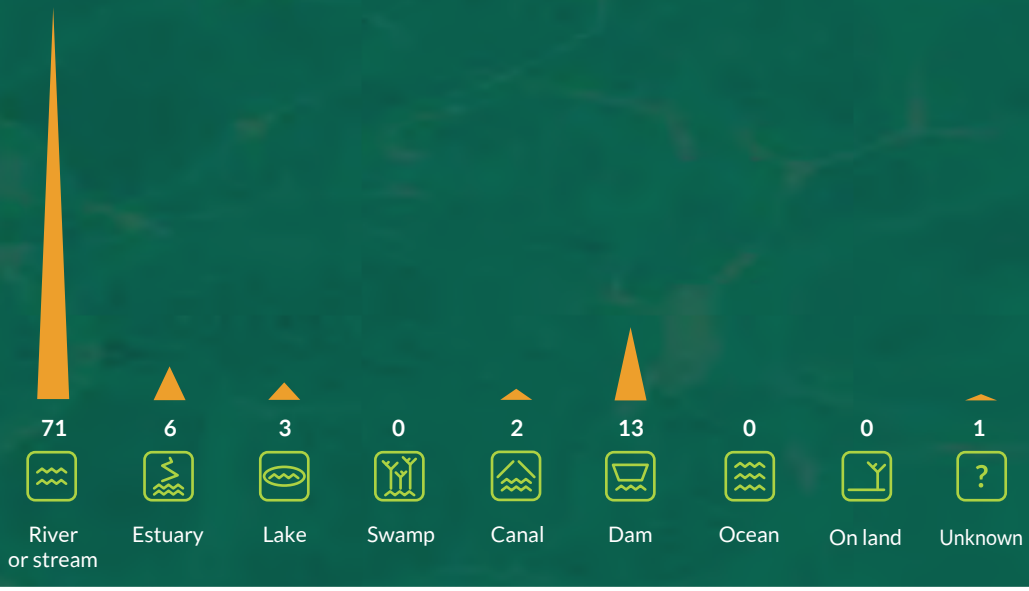
So far our information tells us that:

- **the most dangerous activities are swimming or bathing, fishing, and crossing;**
- **attacks are very seasonal;**
- **most attacks happen in rivers or streams, but dams can also be dangerous;**
- **we should focus our efforts on children especially those aged 10-19, and particularly on boys;**
- **We should make our advice relevant according to gender, and age groups.**

By finding out where, and at what times of year, attacks are happening we can take focussed, affordable and effective steps to reduce attacks. Through learning more about human and crocodile behaviour, in relation to changes in water levels, rainfall and temperature, we can work out when the most dangerous periods are.

Eventually, we hope to offer advice on when it is safer to collect water or cross waterways, for those who cannot avoid doing so. There will always be a chance you could get attacked in waters where crocodiles live, but it may be a much reduced chance if (for example) you do so on a cold day, or at a cool time of day. We can't yet say for sure, so don't rely on this idea yet! We need your help in collecting enough information to help us find out for certain.

Water body



Total number of attacks: 96

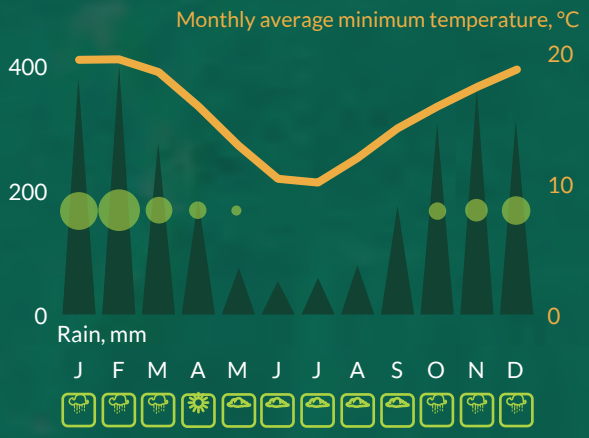
When do attacks happen?

Data for South Africa and Swaziland

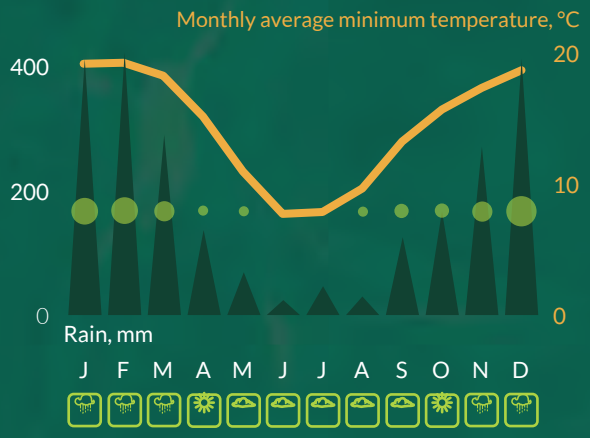
Attacks by month

Wet and hot season | Dry and hot season | Dry and cool season | Number of attacks

KwaZulu-Natal and Swaziland



Limpopo, Mpumalanga and North West



Total number of attacks: 96

Where do attacks happen?

Most attacks have occurred in natural water bodies, and by far the most in rivers or streams. Since the year 2000, there have been an increasing number of attacks in dams.

When do attacks happen?

Crocodile attacks are very seasonal, with most happening in the period from October to March. Some do happen in other months, with only June and July being free of attacks so far. We are very interested to discover why this is so.

There are three main explanations for this seasonality of attacks:

1. It is because crocodiles are cold-blooded (ectothermic) and more active and hungry when it is hot (and inactive when it is cold);
2. When water levels are high in the wet season, the crocodiles move around more and there are more chances of meeting one;
3. Crocodiles are more aggressive in the breeding season, which happens during the warmer, wetter months.

It may be a combination of all three – but none of these arguments has yet been proven. Crocodiles are certainly more active when hot, and are more widespread in the wet season – but it remains to be proven if this is why there are more attacks on humans in certain seasons. This is why we are gathering long-term data on temperature, rainfall and water levels for attack events. We want to try to find out which of these are most important for explaining when and why most attacks happen. It is also important to remember that climatic conditions influence what humans, as well as crocodiles, are doing at different times of the year (e.g. swimming or fishing).

There are two graphs (opposite) because the climate is slightly different overall in KwaZulu-Natal and Swaziland, compared with the interior of South Africa (North West, Limpopo and Mpumalanga). We have decided on what is hot or cool season according to minimum temperatures. This is because, so far, minimum temperature data gives us the best explanation of attack seasonality. More than 90% of attacks occur during periods when minimum temperatures are above 15°C. So far, there is no clear sign that either rainfall or water levels are mostly above, or below, average when attacks occur.

The graphs are regional summaries. For each graph we chose long-term temperature and rainfall data (monthly averages for 20- to 30-year periods) from weather stations in key attack areas. The data shown on each graph is an average of these key regional weather station averages.

Time of day / days of the week

Most attacks have occurred during the day time, but what this really tells us is that people are usually in the water during the daylight hours. Crocs actually hunt more at night. For 13% of the attacks reported, the exact day is unknown. For those where we know the day, 39% of attacks (32 attacks) occurred on weekends. For Monday–Friday, there is a concentration of attacks on Mondays (27%) and Fridays (also 27%). The day with the highest attack rate overall is Sunday with 23 (27% of all attacks with days known). This makes sense in that people are not at school or work and are free to enjoy recreation in the water. It shows us that what people are doing is as important as knowing what the crocodiles are doing.

About the victims

It is very noticeable that most victims are locals, rather than visitors. This is because local people are living near crocodiles all year around, but also tells us that locals do not necessarily know better how to avoid being attacked by crocodiles.

In the period 1984-2014, most people were attacked while swimming or bathing (washing), followed by fishing. In the 1950s and 1960s, more people were attacked while doing domestic chores (e.g. fetching water or washing clothes), or crossing waterways, than have been since 1984. Notice also that the highest proportion of fatal attacks (the victim is killed) for any activity is fishing.

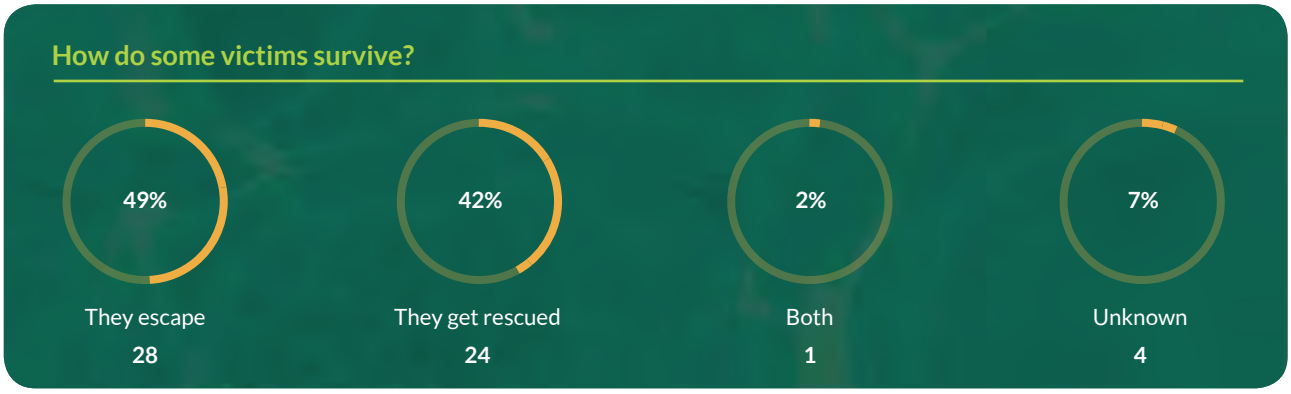
It is interesting that overall more attacks were non-fatal, as it is often said that 60% or more of attacks by Nile crocodiles are fatal. However, we must remember that fatal attacks are probably more often reported than non-fatal attacks.

How reliable are attack reports?

We believe that for most reports, the more people who saw (witnessed) an attack, the more likely it is that it actually happened. Sixty six (68.7%) of the cases included here were seen by more than one witness. Fourteen (14.5%) were seen by only one person, either the victim, or if the attack was fatal, by another person who saw what happened. We are careful about accepting cases where no-one actually saw the attack (5.3%). It is possible that the person had drowned, or been killed by someone or something else, and a crocodile was later seen with the body. Crocodiles are scavengers and help keep rivers and other waterways clean by eating dead fish and animals who would otherwise rot and pollute the water. In some older stories about attacks, there is no information on who reported the attacks, and these are listed as 'unknown' (11.5%).

How do some victims survive?

Perhaps surprisingly, our data suggests that most of those who escape crocodile attacks escape by themselves. However, if you look at adults and children separately, a different story emerges. While 66% of adults (28) survived being attacked, only 46% of children (20) survived. For 14.5% of attacks we are unsure about the ages of the victims. So age and therefore size and strength seem to be a factor in who survives attacks. Some 61% of adults who survived escaped on their own, while only 45% of children escaped (55% were rescued).

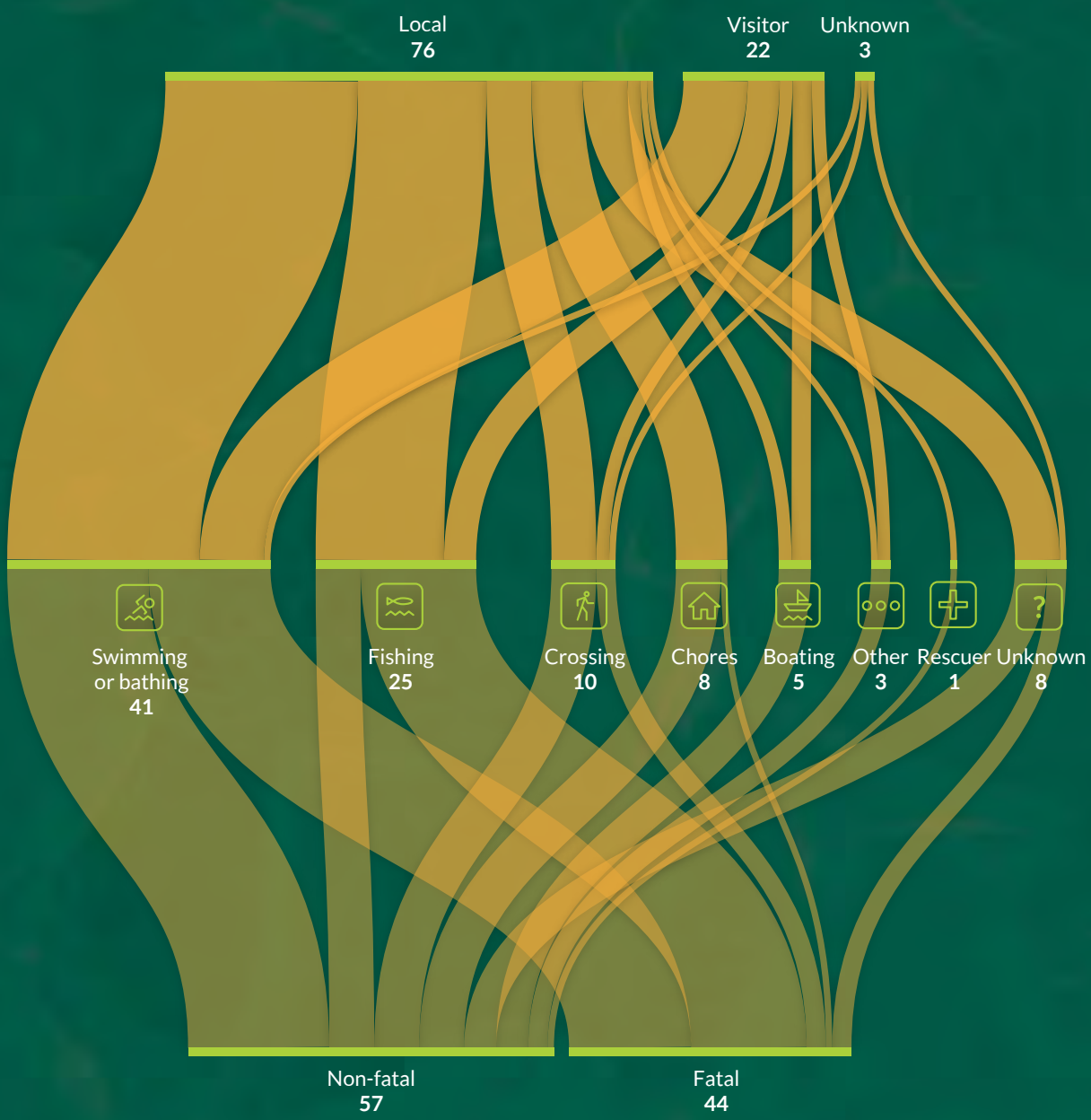


Total number of non-fatal victims: 57

VICTIMS

Data for South Africa and Swaziland

Victim profiles and outcomes

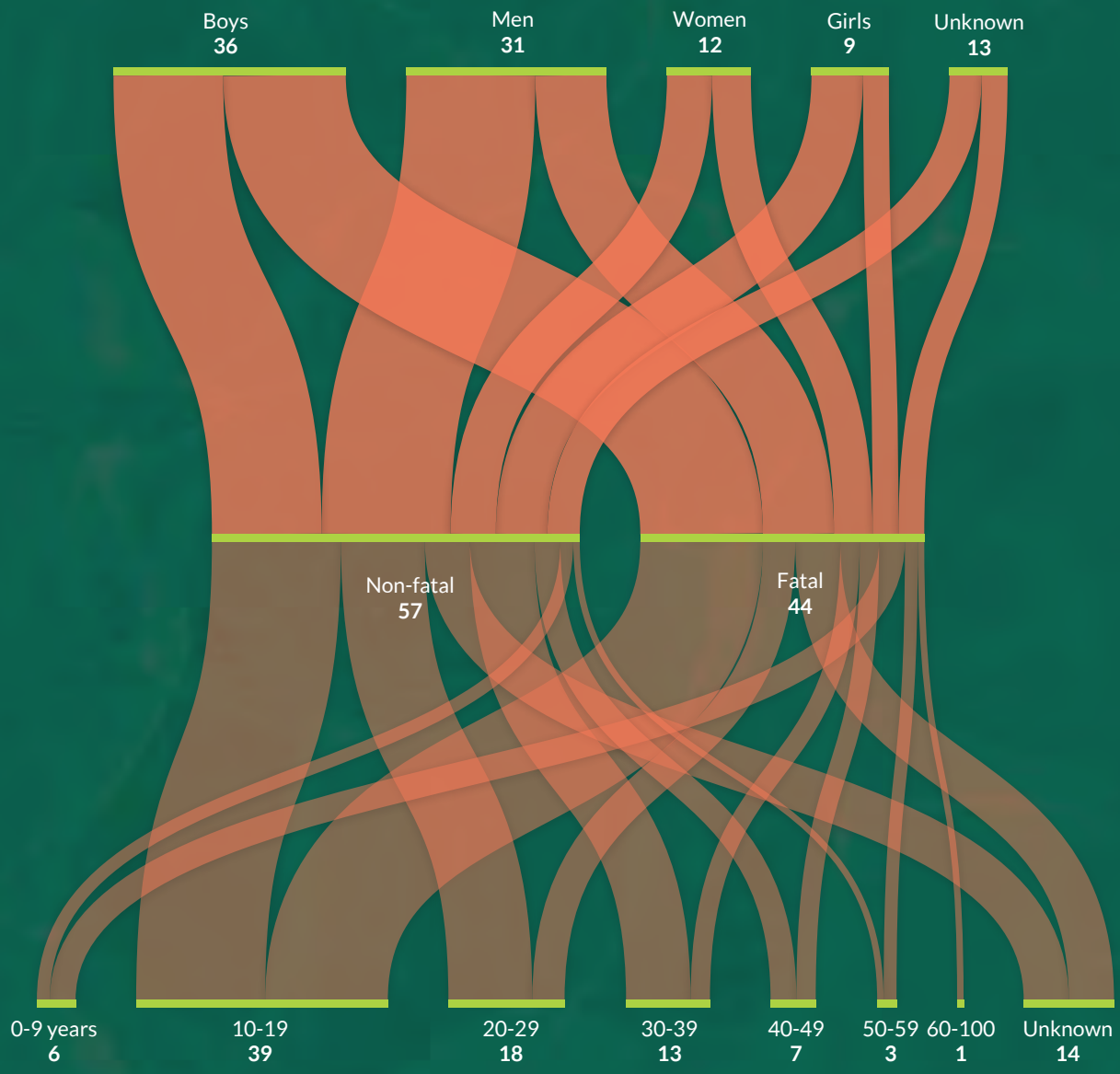


Total number of victims: 101
Some attacks involved multiple victims.

VICTIMS

Data for South Africa and Swaziland

Who gets attacked?



Total number of victims: 101

Who gets attacked?

Males make up the biggest group of victims in the period 1984-2014, and especially boys (41% of attacks where age and gender are known). In earlier times, in the 1960s and 1970s, there was less of a difference between males and females, because many girls and women were attacked while performing domestic chores. The age group with the most victims in the period 1984-2014 has been boys and girls aged 10-19.

Case Studies

Case Study 1

Who: The Tshange brothers
When: 15 February 1993
Where: Enseleni River, KwaZulu-Natal Province, South Africa
It was a hot February day, and Zakhele Tshange (11 years old) and his twin brothers Siyabonga and Musawenkosi (8) were playing and fishing in the Enseleni River. This river meanders down through sugar-cane fields and rural areas, through the Enseleni Nature Reserve, to flow into Nsezi Lake near Richards Bay. The boys were swimming on a stretch of river bordering the farm of David Thomas. Downstream, there is a place named Ngwenyene, meaning 'place of crocodiles'. Crocodiles are seen in the nature reserve. However, the boys had never seen a crocodile in the river where they were swimming, so they thought they were safe.

As the sun went down, they had a last swim, and then headed for home. They waded towards shallow water through a gap between two spits of land. Zakhele led his little brothers towards the riverbank. Suddenly a crocodile erupted from the water and bit him across the chest. Zakhele screamed. Waving his arms frantically, he managed to catch hold of a root sticking out of the riverbank, and hung on for dear life. The crocodile then tried to catch Musawenkosi, who got out of its way. It next turned on Siyabonga, grabbing him by the foot. The crocodile dragged him kicking and screaming into the water, where it drowned him. Musawenkosi ran for help, calling his mother Beauty and their neighbours. They were too late to rescue little Siyabonga, but took Zakhele to hospital in Empangeni. Siyabonga's body was recovered from the river two days later.

Case study 2

Who: Khanyisile Mkhwanazi
When: 10 December 2001
Where: Usutu River, Lubombo District, Swaziland

Sometime after midday on 10 December, Khanyisile Mkhwanazi and her friends were resting after collecting sugarcane from fields near Ngonini. It was a hot day, and she decided to go to the river to get a drink and have a wash. Her friends tried to put her off, because the Usutu River was flooded and muddy, and there are crocodiles in it. However, she went anyway. When she reached the river, she saw a crocodile lying there with its mouth open. Khanyisile went back to her friends and invited them to come and see this 'strange animal'. Her friends came with her, but when they arrived the animal was nowhere to be seen. They took their clothes off and jumped into the river, which was only knee-deep at this point. After swimming about, the other girls climbed out of the river, leaving Khanyisile behind. At this point the crocodile grabbed her. No trace of her was ever found.

Case study 3:

Who: Clinton Bigwood and Jeff Bolleurs
When: 4 February 1995
Where: St Lucia Estuary, KwaZulu-Natal, South Africa
Sometime after 11a.m. on Saturday 4 February, Clinton Bigwood (30) and Jeff Bolleurs (37) waded into shallow water in Shark Basin, St Lucia Estuary, to wash the mud off their feet. They were staying at the nearby Sugar Loaf campsite, and despite the warning signs at the camp entrance about crocodiles and hippos, believed they were in no danger in the shallow water. Many people ignore the warning signs and swim or wade in the water at this popular fishing resort. In fact, a large crocodile had been seen sunning itself near Shark Basin for three days in a row, but this was before the men arrived at St Lucia.

Seconds after Clinton entered the Estuary the crocodile lunged out of the water so fast he didn't see it, grabbing hold of his right leg. He tussled with the crocodile for several minutes, trying to force open its jaws, but it was too strong. Then his friend Jeff bravely joined the fight, jumping onto the crocodile's head, and kicking it, until it let go. The crocodile then turned on Jeff, and another fight began. Clinton was too badly hurt to help, and managed to limp to shore, shouting to Jeff to hang on until help arrived. Jeff shouted back that he was doing his best, but the crocodile was dragging him into deep water. After a 10-15 minute struggle, the crocodile killed him, while his friend watched. A Natal Parks Board ranger then arrived, attended to Clinton Bigwood and organised two boats to search for his friend. Witnesses saw the crocodile break the surface with Jeff Bolleurs still in its mouth. They threw rocks at the crocodile, which reluctantly released Jeff's body, which could then be brought back to shore.

Since the 1950s there have been eight attacks in other parts of the St Lucia lakes, and many more in its feeder rivers. In addition to these, there have been seven attacks at the Estuary itself, four of those since the attack on Clinton Bigwood and Jeff Bolleurs. Incredibly, if you visit the Estuary today, you will still see people wading in the water, fishing on the very edge, and even feeding the crocodiles!

Case study 4:

Who: Mamedudla Nxumalo and Musa Nsukwini
When: 30 October 2007 and 6 January 2008
Where: Sibhicayi River, KwaZulu-Natal Province, South Africa

In October 2007, a man known as Mamedudla Nxumalo was believed taken by a crocodile while fishing (no witnesses). A crocodile was known to be living in that part of the Sibhicayi River, and had killed two cattle there. Ezemvelo KZN Wildlife staff set traps and caught a 3.16m crocodile which later died, and was found to contain human remains. The chief and the locals were warned about the dangers of crocodiles in the river.

On 6 January 2008, three boys were fishing in the Sibhicayi River near where the man had been attacked the previous year. Musa Nsukwini (14) was seized by a crocodile, and pulled underwater. He reappeared and screamed for help, but his friends were too shocked to respond. The crocodile disappeared with Musa, and his body has never been found.

In each of these case studies, the victims knew there were crocodiles in the rivers. In each case, they thought they were safe. Some thought it was OK to enter the water because they had not seen crocodiles in it themselves. Some thought they were safe in shallow water. There are many other examples where people ignored warnings and got into the water anyway, only to be attacked by a crocodile. It is important to know a few things about the biology and behaviour crocodiles, to understand why it is always extremely risky to enter water where there are large crocodiles (see page 17).

Total number of attacks: 96 Total number of victims: 101
Some attacks involved multiple victims.

Risk and what we know

Calculating risk requires knowledge about a lot of things. Ideally, we need to know what people are doing in the water when they are attacked, as well as when they are not attacked. We need to know what people and crocs are doing in the water, when and why. For now, we know most about the 'hits' (attacks) and less about the 'misses'. We know about what has happened when croc attacks did happen. It is important to remember that not all attacks are reported, and in some cases we have only a few details about the attack. Our summary in this section is based on what has been reported. You can help us by sending us more information on croc attacks in your area.

KEY FACTS

Data for South Africa and Swaziland

Most dangerous activity

See page 14 for key to icons

40% of victims were swimming or bathing (but 8% unknown)

Total number of victims: 101

Victim gender

Men (20+) Boys (0-19) Women (20+) Girls (0-19) ?

66% of victims were males (but 13% unknown)

Total number of victims: 101

The most dangerous water bodies were rivers or streams (74% of attacks), followed by dams (14%). Seventy one percent of dam attacks (10) have happened since 2000, and 57% since 2011, with 6 dam attacks in 2014, so there seems to be an increase in dam attacks over recent years.

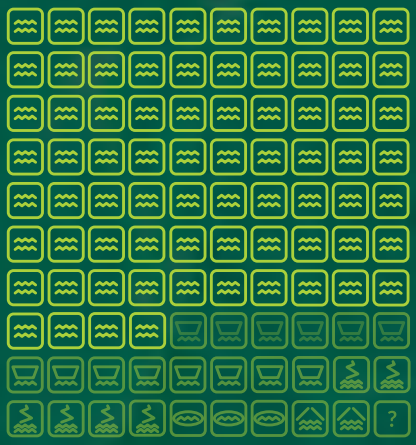
In the period 1984-2014, 66% of all attacks were on males. Of these, 54% were attacks on boys. Forty-two percent of attacks on females were on girls. The ten-year age group with the highest attack rate is children aged 10–19 years (45% of all attacks where victim age is known), followed by adults aged 20-29 (21%). Overall, 51% of all attacks where age is known (88) were on children (0-19 years).

Most people were bitten while they were swimming or bathing (40%). The next highest category is fishing (25%). A very high proportion (72%) of attacks on people fishing were fatal, with swimming the next highest (46%).

Most adults were attacked while swimming and bathing (15 attacks), followed by fishing (12). However, more women were attacked while crossing or doing domestic chores, than were attacked while swimming or fishing. Most children were attacked while swimming or bathing (24 attacks) and fishing (9). Of these, 90% of those swimming, and 88% of those fishing, were boys.

Most dangerous water body

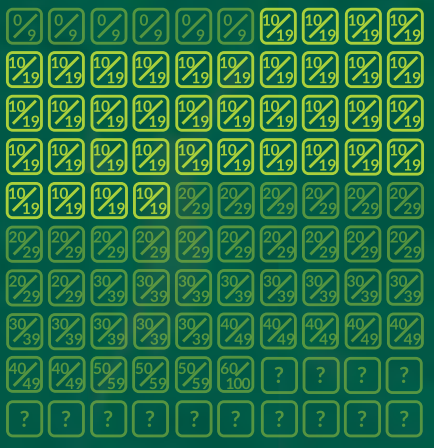
See page 7 for key to icons



74% of attacks took place in rivers or streams

Total number of attacks: 96

Victim age



45% of victims (where age is known) were in the age group 10-19

Total number of victims: 101

About the Nile Crocodile

Crocodiles have evolved over millions of years to become key predators of Africa's waterways. Their bodies are supremely well adapted to stealthily approaching and catching land-living mammals like us. Their nostrils, eyes and ears are raised up on their flat heads, so they can hide almost all of their bodies underwater and still smell, see and hear us. All of their senses are good, and they are usually aware of us long before we are aware of them.

Crocodiles' cryptic colouring makes them hard to see in the water. They have a special heart and circulation system which allows large crocodiles to stay underwater for well over an hour. You may look as carefully as you like at a stretch of river or a lake or a dam for up to an hour and not see the crocodile waiting for you on the bottom. Don't assume that because a dam or a natural pool is not near a river or stream with crocodiles in it, there isn't a crocodile in it. They travel long distances overland, usually at night, and may be resting up in a small pool. If there are crocodiles anywhere in the area, be careful.

Crocodiles lie on the banks of rivers for hours on end, apparently doing nothing, and this misleads people into thinking that they are slow, stupid and lazy. Because they are ectothermic, they can't regulate their own body temperature, so they must lie in the sun to warm up, or cool off in the water. However, as anyone who has seen a crocodile attack knows, a croc can lunge half its body length in a split second (that is 2m for a big croc). On land, crocodiles can accelerate from 0 to 20 km/h (top speed for fast adult humans) very quickly, and keep going for a short distance!

Crocodiles spend a lot of time watching what's going on around them. They notice where animals come to drink regularly, and when they are hungry, they know where to go hunting. If you wash your clothes or swim in the river at the same place every day, the crocodiles will notice. If you cross the river,

Crocodile species responsible for attacks in the region: Nile crocodile *Crocodylus niloticus*

Are crocs usually found near the attack site?

Total number of attacks: 96

What happens to the croc?

Total number of attacks: 96

collect plants or catch fish in the water at the same place regularly, the crocodiles will notice. With just the top of their heads exposed like the periscope on a submarine, crocodiles can aim themselves towards a person on the edge of the river, sink below the surface without a ripple, and approach invisibly underwater until close enough to lunge out of the water and catch them.

Do not think that crocodiles will be frightened away if you make a big noise in the water. Do not think that you are safe if there are a lot of you. In the Serengeti in East Africa, there are migrations in which thousands of wildebeest and zebra cross the Grumeti River. Every year, large crocodiles wait eagerly for this migration, and they are not bothered by the huge noise or the hundreds of animals. Many people have been attacked while swimming, fishing or crossing in large groups. You may have a better chance of being rescued if you are in a group, but you are not safe from attack. The noise of splashing attracts crocodiles.

How big are the crocs?

In the wild, there will be more small crocs than medium-sized or large ones, because most young crocodiles don't survive to adulthood. Young crocodiles eat mostly invertebrates (insects, crabs) and frogs, moving on to fish as they grow larger. Most bites by small crocs will be mistakes or defensive. Medium sized crocodiles can catch animals, and large crocodiles can easily catch large mammals, including ourselves. We are curious to discover if more attacks are by medium-sized or large crocodiles, and whether more attacks by large crocs are fatal. However, because it is hard to guess the length of a crocodile, only actual measurements, or some estimates by experienced individuals, are included here. We don't have enough accurate measurements to answer these questions yet.

Total number of attacks: 96

How not to get bitten by a crocodile

Considering how many crocodiles live in the waterways used by humans, the surprising thing is that there are not more attacks. Crocodiles are actually not rapacious eaters or 'killing machines', and eat much less than mammalian predators like lions. They eat seldom during the cooler months of the year. They do not specifically hunt humans (so-called 'man-killers'), but see us as prey just like other animals. That said, it is not worth taking risks in waterways with crocodiles in them. Here are some ways of avoiding attacks.

* Take any warning signs very seriously.
* If you are visiting an area where crocodiles are known to occur, seek advice on how safe it is to paddle, swim, fish or boat in the area.
* Don't assume there are no crocodiles present if you can't see them. Stand at least 3m from the water's edge.
* Don't allow your children or pets to wade in the water if there is any chance of crocodiles being in the area. Small children and pets cannot read, so it is up to you to warn them.
* If you have to enter the water, stay in for the minimum time, and keep quiet. Noise will attract crocodiles, not scare them away.
* If your fishing line gets tangled in the reeds or whatever, cut the line. Do not go into the water to disentangle it: your life is worth more than your fishing tackle.
* Remember that crocodiles travel over land and especially in the wet season can be found in small water bodies far from the nearest lake or river.
* Don't leave dead animals near the water's edge, and don't gut your fish next to jetties. This will attract crocodiles.
* Don't allow anyone on your boat to dangle their legs, arms or bottoms in the water if there are crocodiles in the area.
* If you see a baby crocodile, get out of the water. Don't try to catch it. The mother may well be nearby.
* While crocodile attacks could in theory occur at any time of year, the chances in this region are highest from October to April, and especially from December to February.
* If you can't avoid going to a river or lake for water regularly, build a sturdy crocodile-proof enclosure so you and your friends and family can do so safely.
* Do not rely on magic charms to protect you – victims of attacks have been found still wearing crocodile teeth which were supposed to protect them from an attack.

What can you do if you are bitten?

If you are attacked by a big crocodile, there is probably not much your friends can do to rescue you. A 4.1-metre-long male Nile crocodile is 5-6 times the weight of a man. It has 64-68 large pointed teeth and its jaws have tremendous crushing power. The croc will grab hold of you and try to drown you, and a croc can hold its breath much longer than you can. A special flap at the back of its mouths allows a croc to hold its prey underwater without swallowing water. Based on the attacks surveyed so far, where the victims have survived, there are a few things you can try. You could also try these to rescue someone else. There is no guarantee they will work!

1. Shove something like a stick, reed or fishing rod down the crocodile's throat. In a few cases the victim, finding it impossible to pull free from the crocodile's grip, shoved their arm or leg further down the crocodile's throat and forced it to let go!
2. Poke the crocodile in the eyes or nose
3. Try to stay on your feet, and don't allow yourself to get pulled into deeper water.

Treatment

Obviously get professional help as soon as possible. In the meantime these basic steps will help:

1. Move the person to a place of safety well away from the water
2. Ensure they have a clear airway and can breathe, especially if they have been underwater
3. Ensure circulation is good and stop any bleeding
4. Bones are often broken by the force of the crocodile's bite, and should be splinted if you know how

If you have to wait a long while for assistance:

Wash out the wounds with plenty of clean water and soap or disinfectant if available, and bandage them with sterile dressings. Infections are a major complication of crocodile bites. If you have a broad spectrum antibiotic tablet or powder available, this might help to control wound infection.

How you can help prevent attacks

1. Read this guide and share the knowledge (on pg 19) with your friends and community;
2. Tell us about crocodile attacks in your area – see the attack report sheet at the end of this guide;
3. Tell us what people are doing in the water in your area, where, and at what times of year (draw a map if you can);
4. Tell us about crocodiles in your area, for example, how many are there, how big, what do they eat, where do you see them, and at what times of year? Draw a map if you can;
5. Suggest how we can improve this guide – were there things you didn't understand, or would like to know more about?

Attack report form

This is a summary of the kinds of data we are interested in. Answer just the questions you can – all of the information is useful to us. If you don't know, it's better not to guess.

Email this information to Simon Pooley at croc.conservation@gmail.com or upload it to the CrocBITE website at **http://www.crocodile-attack.info/** Email to request a postal address.

If we can verify your report, for example through police, conservation or newspaper reports, we will add it to CrocBITE. Your information will be included in the next version of this guide. Your name will be added to the list of contributors on CrocBITE.

ABOUT YOU

Tell us a bit about you (age, name, what you do, what area you live in) _____

_____

_____

Contact details: _____

_____

ATTACK LOCATION:

Country and province or district: _____

Nearest town or village: _____

_____

Water body name: _____ GPS (if possible): _____

_____

WAS THE ATTACK:

On land, at the water's edge, in shallow water, some distance from the edge, in deep water? _____

_____

WHEN:

Date: _____ Time of day or night: _____

_____

WITNESSES: _____

How many? _____

Who (and did you see the attack)? _____

List any official or media reports: _____

BRIEF DESCRIPTION OF WHAT HAPPENED: _____

_____

_____

VICTIM/S: _____

Name/s: _____ Age/s: _____

adult or child: _____

male or female: _____

Local or visitor: _____

Where are they from (e.g. town or village)? _____

ACTIVITY

Was the victim: swimming or bathing; fishing; crossing; doing chores (e.g. collecting water, washing clothes); boating; doing something else; rescuing someone; or no-one knows?

Was this activity for work, subsistence (e.g. food to eat, water to drink), or for fun?

WAS THE ATTACK FATAL OR NON-FATAL?

Did the victim escape by themselves?

How did they escape?

Or were they rescued?

How were they rescued?

INJURIES AND TREATMENT

At CrocBITE we are interested in details about the injuries sustained, the treatment and aftercare of crocodile bites. This will help us develop a treatment protocol for croc bites. However, this information is very personal and requires permission from the victim. Contact us if you have access to such data and we'll send a consent form. This data will be confidential and only available to us and medical researchers.

CROCODILES

How many crocodiles were involved?

How long was the crocodile?

Was the croc measured or was its length estimated?

What condition was the crocodile in (e.g. thin, fat, injured, etc.)?

Are crocs usually / sometimes / never seen at the attack site?

Was the croc killed, injured or caught, or did it escape?

What did the croc do before, during and after the attack?

WATER CONDITIONS Describe anything you noticed, e.g.

Was the water still, or fast-flowing?

Was the water level low, average, or full / flooding?

Was the water muddy or clear?

WEATHER CONDITIONS

Was it sunny or overcast?

Was it raining or had it been raining (daily and monthly actual measurements would be best)?

Was the temperature cool, average or hot (daily and monthly actual measurements would be best)?

ANYTHING ELSE YOU WANT TO ADD: