



# Spotlight

October 2023

# Dear readers

Welcome to the first issue of Spotlight. As a spin-off mini-magazine of our renowned magazine "Public & Global Health Spotlight", we also present interesting articles from the world of travel medicine in this magazine.

In this first issue, we embark on a diverse adventure through the enchanting landscapes of Central and South America. From the lush jungles of Panama and Costa Rica to the backpacker paradises of Central America, we take you on an exciting journey of discovery to the most fascinating destinations.

But traveling isn't just about the pursuit of adventure. It's also about staying safe and healthy on the road. That's why in this issue we also highlight topics such as yellow fever and altitude sickness, and provide you with important information to ensure that your travels are not only memorable, but also worry-free.

We hope you enjoy reading this issue!

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# Travel Guide Panama - Costa Rica

With breathtaking nature, endless beaches, exciting culture and perfect surfing conditions, Panama and Costa Rica have a lot to offer. However, there are certain health risks lurking on such a trip. In this blog post we explain how you can start your journey fit and return home healthy.



## Do I need to get vaccinated against yellow fever?

Yellow fever is a potentially fatal disease transmitted by mosquito bites. Fortunately, the spread of this disease is limited to the area east of the Panama Canal, with the exception of Panama City and the San Blas Islands. Vaccination is only recommended if you are planning to visit this region or if you are potentially travelling on to a country with a corresponding entry regulation (such as Nicaragua, for example).

## What other vaccinations are recommended?

Before any trip it is good to ensure that all of your basic immunizations are up-to-date. Additionally, we recommend vaccinations against Hepatitis A and B.

## Do I have to worry about Malaria?

Fortunately, Panama and Costa Rica have extremely few cases of malaria. So you don't need to take malaria prophylaxis with you in most cases (it is only recommended to take an antimalarial if you are travelling to certain regions east of the Panama Canal, but this does not include the

area around the Panama Canal or Panama City). However, you should still protect yourself against mosquitoes as other diseases can be transmitted by mosquito bites. These include dengue fever, chikungunya and Zika.

## How can I best protect myself against mosquitoes?

It is best to wear light-colored long-sleeved clothes impregnated with insecticide (Nobite®Textile). Repellents (Anti-Brumm®, at least 30% DEET) should be applied to the skin regularly and used after applying sunscreen. At night we recommend sleeping under (impregnated) mosquito nets and/or with the air conditioning running.

## Do I have to worry about the food?

In general, Panama and Costa Rica have rather clean water and good food hygiene in tourist areas. Many hostel and hotel managers even claim that you can drink the tap water. However, we recommend being careful and only drinking filtered water and eating cooked, fried or peeled food ("cook it, boil it, peel it or leave it"). Typhoid fever, a serious food borne disease, is extremely rare in Panama/

Costa Rica, which is why the typhoid vaccine is not generally needed. The most common complaint from travelers is Traveler`s Diarrhea. If you experience Traveler`s Diarrhea, it is important to drink enough and eat salty food. Loperamide (Immodium) can be taken for short-term symptom relief. If you have diarrhea with fever, stomach or intestinal cramps or blood in the stool, seek immediate medical help.

### Should I get vaccinated against rabies?

The WHO has not reported a case of this fatal disease in humans or dogs in either country. Wild animals and bats could be potential carriers of the disease, however, the risk is very small (wild animals are shy and bite extremely rarely). We therefore do not primarily recommend a vaccination against rabies. If your travel route goes further within Central America and/or to South America, vaccination may be considered. In case of scratch or bite injuries, the wound should be cleaned and disinfected immediately and thoroughly with plenty of soap and water for ten to fifteen minutes before going to hospital immediately and seeking advice from local medical staff.

### It's not just about you.

Travelers are often responsible for spreading diseases. Good examples of this are the recurring measles outbreaks in Africa caused by European travelers or the Covid-19 pandemic. So when you get vaccinated, you are not only protecting yourself but also the local population of your travel destination where the health system may not yet be so well developed and the population not sufficiently vaccinated. In certain countries there is also an increased risk of re-importing diseases that have been eradicated in the country, such as malaria in Sri Lanka, polio in many developing countries and yellow fever. You can do your part by getting vaccinated against the relevant diseases, taking precautions such as mosquito repellent or malaria prophylaxis depending on the country you are travelling to, and seeking medical care if you fall ill after returning home.

### Summary: Relevance

Yellow Fever:		For the Darién Gap or to enter other countries
Malaria:		Malaria rare but present
Dengue:		High risk endemic
Food hygiene:		Relatively clean water / food poisoning less frequent
Rabies:		Rabies only in wild animals
Safety:		Moderately safe, safety index score 64 or 66

# 5 Things to Keep in Mind When Backpacking in Central America

There's nothing more exciting, yet also nerve-wracking, than going on your first trip without your parents. Whether it's your first big travel experience ever or just the first one you're taking with friends or entirely by yourself, it's an exciting time.



Still, it's important to remember that when traveling on your own, you're the one who is responsible for ensuring that you have a safe trip and stay healthy. It's up to you to make sure that poor preparation doesn't ruin your trip or even the weeks/months after it.

Don't worry, though, because we're here to help!

If you plan to go backpacking in Central America but aren't sure how to stay healthy on your trip, this is a great starting place for those interested in responsible traveling. Let's talk about 5 things to keep in mind so that you can enjoy your trip, make memories that last a lifetime, and stay healthy.

## 1. Prepare Ahead of Your Trip

The best way to ensure a smooth trip is to prepare ahead of time by scheduling an appointment with a travel consultant. They are your one-stop shop for all things healthy travel-related.

Your travel consultant will let you know if you need any vaccinations or if there are any health concerns you should be aware of based on your travel location. On top of that, if you have any existing health conditions, your travel consultant can help you prepare for a safe trip ba-

sed on your itinerary.

If you know that you want to be a responsible traveler but aren't sure what you need to do to stay healthy, booking an appointment with a travel consultant is how you can get all the advice you need.

## 2. Watch What You Eat And Drink

Traveling is a great opportunity to sample local flavors and try the foods native to your destination. However, be aware that traveling to Central America can put you at greater risk of food or waterborne illnesses, which can cause minor diarrhea or flu-like illnesses that put a wrench in your travel plans.

The best way to minimize the odds of this happening is by drinking only bottled or boiled water. Don't forget: Ice cubes are mostly made of tap water and should be avoided. As for food, make sure to only consume fully cooked and fresh food, including meats, vegetables, or fruits. Avoid salads and fruit salads, as well as fresh juices. Additionally, if something doesn't smell or taste right, stop eating it. If you get diarrhea, keep yourself hydrated and pay attention to electrolytes and sugar, as dehydration is a common and dangerous complication.

### 3. Mosquitoes Do More Than Bite

When traveling to Central America, it's important to be aware of the health conditions you are at risk of contracting, including malaria and dengue.

Transmitted by the bites of infected mosquitoes, malaria infects more than 240 million people each year and can be fatal in some cases.

You can take many steps to protect yourself from malaria, such as taking antimalarial drugs before going on your trip. While on your trip, you should also wear impregnated long-sleeved shirts and pants and mosquito repellent with DEET. In addition, Mosquitoes are active not only during the day but also at night, so it's recommended to sleep under a mosquito net.

Also, be aware that the signs of malaria might not show up until months after your vacation. So, if you notice chills, high fever, or body aches after your trip, reach out to your doctor so that you can start treatment quickly.

### 4. Be Aware Of Viruses In The Travel Destination

Most people receive vaccines growing up that protect them against the viruses most common in their country. However, Central America can house some different types of viruses that you may not have received a vaccine for. Without any protection against these viruses, you can not only get infected and ill, but potentially pass along the illness to someone else.

If you're unsure which vaccinations you need, a travel consultant can help.

### 5. Be Careful with Heights

When traveling to Central America, there are plenty of exciting activities to fill your days with, such as scuba diving or hiking through the acres of forests. However, being aware of your altitude is essential, especially when doing an activity requiring exertion.

Central America offers many exciting hikes, such as Tajumulco Volcano or Chirripo Grande, but these high-altitude hikes also put you at risk of altitude sickness.

Much as the name suggests, altitude sickness results in feeling unwell due to being at a high altitude. When at a high altitude, barometric pressure is lower, which limits the amount of oxygen in your lungs. This can then cause a headache, fatigue, difficulty breathing, dizziness, insomnia, or nausea, making you feel immensely unwell.

Altitude sickness can affect anyone, regardless of age.

Even fitness does not protect you from altitude sickness. If it hits you, a descent to lower altitudes is recommended.

Most importantly, even some of the cities in Central America, such as Mexico City, are at a higher altitude, so it isn't even just hiking that can expose you to it. Knowing this, the best thing to do is give your body time to acclimate to the new altitude by adding a few easy days at the beginning of your trip instead of jumping right into excursions. Additionally, when you do travel to cities at higher altitudes, try to do so gradually, making your way from lower-elevation cities to higher elevations.



The best way to stay healthy is to receive recommended vaccinations before your trip. Remember, however, you are responsible for your own health and safety, of course.

## Enjoy Your Trip, and Stay Safe

Above, we have compiled 5 tips to get you started on your backpacking trip to Central America so that you know what steps to take to have fun and stay healthy.

If you are unsure about your vaccination status or have questions about altitude sickness or possible diseases at your destination, we would love to help you out. You can book a travel consultation where we will walk through all elements of your trip to help you have a great time and stay healthy.

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### References

Fact sheet about malaria. (2023). <https://www.who.int/news-room/fact-sheets/detail/malaria>

Dehydration and diarrhea. (2003). *Paediatrics & Child Health*, 8(7), 459-460. doi: 10.1093/pch/8.7.459

Altitude sickness - NHS . (2017). <https://www.nhs.uk/conditions/altitude-sickness/>

# Wanderlust Chronicles - Episode 1 - Argentina

Dr. med. Rodolfo Novillo is originally from Argentina and lived there until he moved to Switzerland in August 2020. He studied medicine in his native province of Tucumán, and later specialized in internal medicine in Buenos Aires. He also spent a year after that working in the Emergency Department. Currently he is working in EBPI in the role of Project Coordinator of the Reference Vaccination Center. In this post he invites us to to know and travel around his country - Argentina.



Dr. med. Rodolfo Novillo

Travel Clinic UZH

*I apologize in advance for any biased views about my country that may or may not reflect my passport or my nationality. :-)*  
*This is not a travel guide including itinerary. It is rather some tips from one of the locals, wanting to share a (very, very small) part of my own country.*

## Why Argentina?

Argentina it's neither perfect, not close to being so, nor does it pretend to be so. And that is where its charm and beauty lies. No matter if you like big cities or small towns lost in the immensity; adventure tourism or family vacations; sea, mountains or deserts. There is something for all tastes.

The name Argentina comes from the latin word for silver, argentum. When the original Spanish conquerors first met the indigenous people in the region, they received silver objects as presents.

It's a country in which different cultures come together, ranging from European to Latin American, with amazing landscapes and traditions. Its history is a fusion of native people and the large European population that migrated to the country pre WWII, which resulted in an unreproducible blend.

Geographically, Argentina is extremely vast, being the 8th largest country in the world and the largest Spanish-speaking country. It has all possible climates and landscapes. To see it all in one trip is simply out of the question, so my first piece of advice is: don't even try.

## Preparation

It is recommended to have a consultation with a specialist in travel medicine prior to traveling. According to the kind of trip that is planned, the recommendations will be adapted to that.

For most people, it'll be standard vaccinations. While there are no required vaccinations to enter the country, it's recommended to be up to date with your COVID vaccines. Argentina has good health and dental services available and it's affordable – sometimes even free, including for foreigners. But it was always very important to book trusty medical insurance before travelling anywhere.

*Medical recommendations below.*

## Highlights

### Buenos Aires

Most of the travelers enter the country through Buenos Aires. It is an incredibly vibrant, cosmopolitan city, rich in art, history, and culture, that offers an endless array of activities and events. Argentines and Porteños (natives of the capital) are very friendly, engaging, and open to foreigners who are curious about our way of life.

### Tips:

- Taking time to sit in a "**porteño**" bar to have a coffee on the sidewalk and just watch the people passing by.
- Dance to the rhythm of the tango on "Caminito" street in **the neighborhood of "La Boca"**.
- The Market or "Mercado" of **San Telmo** and its surroundings.
- Only for the bold ones: **Argentine soccer**. They say that nobody lives soccer like the Argentines. If you are lucky enough to be able to go to see a soccer match (the classic River-Boca or similar) it is an experience from another planet. It is a fascinating show, people are transformed and let their wild side flourish.
- **La bomba del tiempo**: a great show with live music on monday nights. Difficult to describe, but recommended. Only for people over 18 years old.
- Walking through the **neighborhoods** of Monserrat, Palermo, San Telmo, and Recoleta.



## Northwest of Argentina

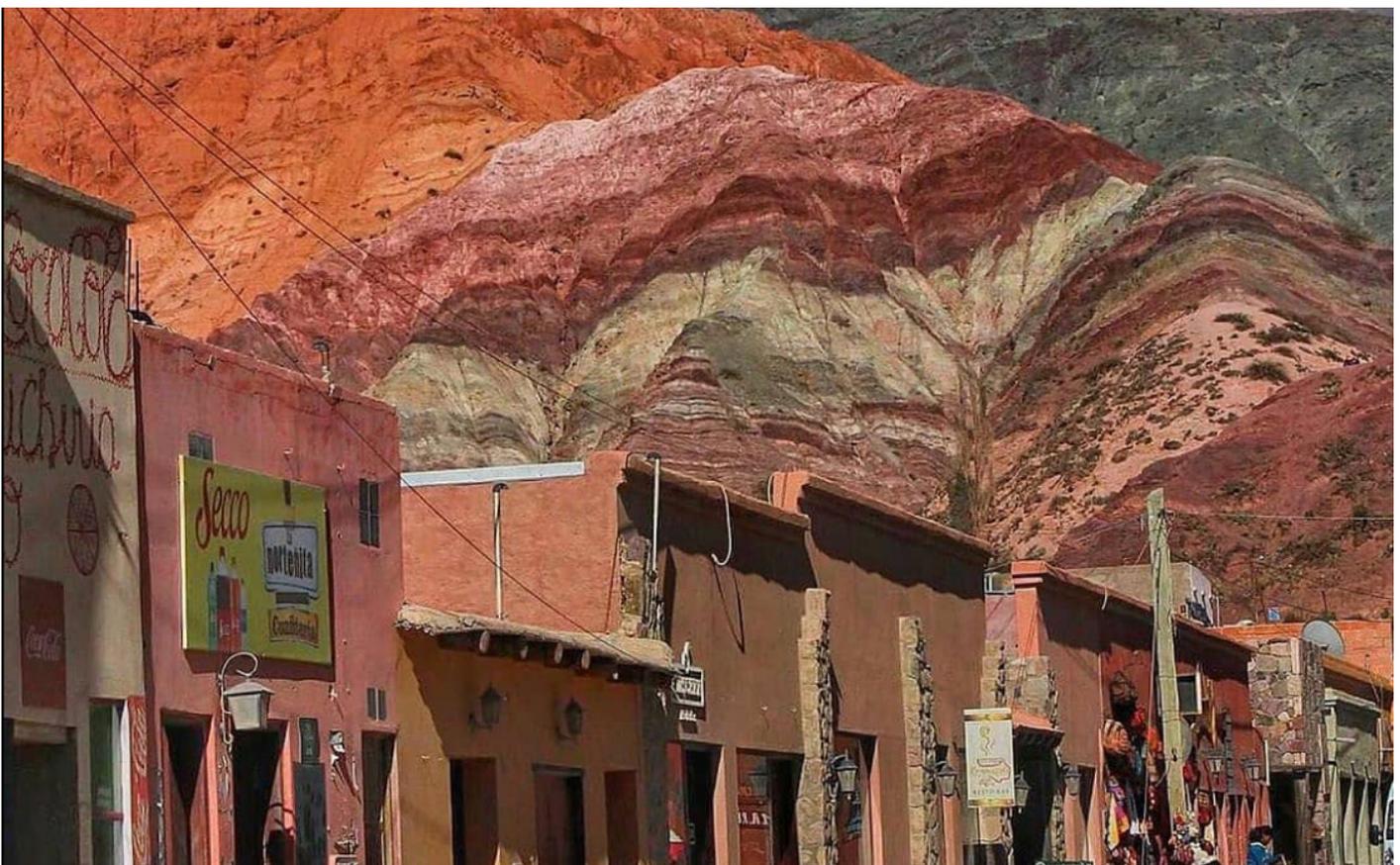
### (The area where I come from)

This is the most traditional region of Argentina, and an area where the size and influence of the indigenous population are still significant. El Noroeste Argentino – often referred to as NOA or simply “El Norte” is infinitely varied.

Note: Most of the recommended places are above 3500 meters above sea level, so you should be careful to avoid altitude sickness. Due to the altitude, the temperature is usually not high, but the sun is imperious and unforgiving. Remember to stay hydrated, use sunscreen and avoid prolonged exposure to the sun.

### Tips:

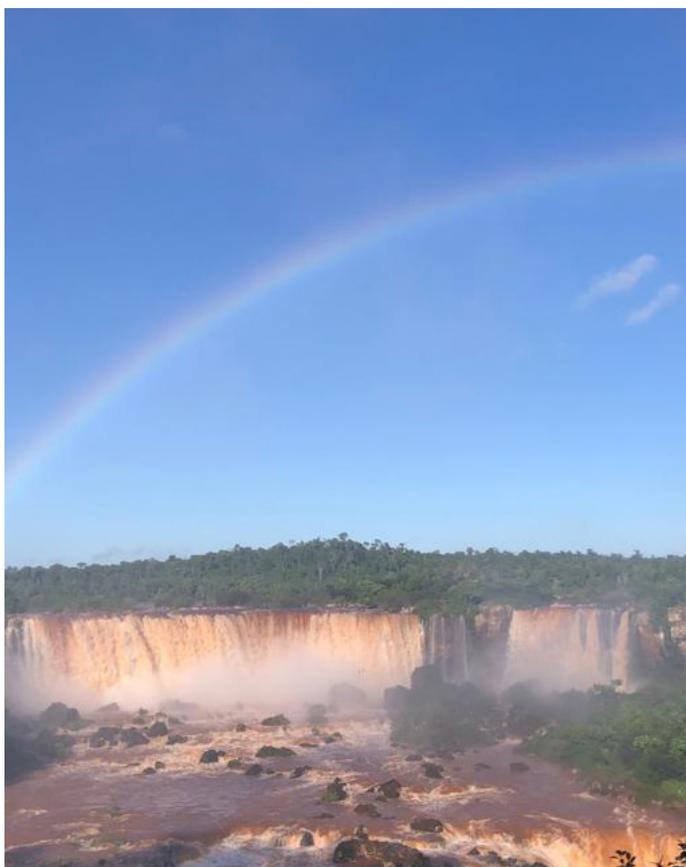
- The **Quebrada de Humahuaca Mountain Valley** is a Unesco World Heritage Site.
- **Purmamarca** is a tiny village in the valley, whose majority of visitors come here to see the **Cerro de los Siete Colores** (Hill of the Seven Colors).
- The next stop after Purmamarca is **Tilcara**. With around 6,000 inhabitants, Tilcara can date its origins back to the pre-Inca era. It's a charming little town.
- **Cafayate**, the circular route that begins in Salta and passes through Cafayate and Cachi before returning you to Salta is one of Argentina's great road trips.



### ***Northeast of Argentina: Iguazu Falls***

Iguazu Falls is one of the world's most spectacular and impressive waterfalls, straddling the border between Argentina and Brazil in South America. With more than 275 individual cascades, Iguazu is actually the biggest waterfall system in the world.

The upper and lower circuits at Iguazu both have some amazing panoramic views of the waterfall to enjoy, but in my opinion the very best thing to see in Argentina is the Devil's Throat viewpoint (in Spanish: 'Garganta Del Diablo'). There you can stand and gaze directly into the center of Iguazu Falls, which has a massive U-shaped curtain of water with a tremendous roaring sound and a cloud of mist.



### ***Cuyo: Mendoza***

Mendoza is located in the foothills of the Andes and its Argentina's wine capital. Many visit Mendoza for the world-renowned wineries and vineyards but it's also a popular destination for outdoor activities.

No matter what cardinal point is chosen, Mendoza has everything. To the North, the high country circuit is an invitation to find Mount Aconcagua and all the paths that lead to the highest summit in America

The South can offer recreational activities and adventure sports in natural scenes such as world-class biking, climbing, skiing, hiking, and rafting.

### ***Patagonia***

It is one of the most diverse regions in the world and one of my all-time favorite places. The region covers an area of more than 1.000.000 square kilometers and contains pretty much everything from steppes, deserts, lakes, mountains, and glaciers. Its spine is the Andes Mountain range, the southern tip ends with Tierra del Fuego, which is considered the southernmost point of the world. This is truly a place to get away from the crowds.

It is easy to fall in love with Patagonia. But you need to know the weather conditions are harsh, public transport is often unreliable, and prices are much higher than the rest of Argentina. I would definitely suggest to rent a car if you want to move around freely in this region.

#### ***Tips:***

- **Puerto Madryn** is a beautiful seaside town located right in the middle of one of the largest whale breeding bays in the world. Is a place where you can come watch whales swimming with their young ones only meters from the shore. Best time of the year to do this is June, July, and August.
- **Bariloche**. This city is like a mini-Switzerland (keeping in mind cultural differences). As a matter of fact, there is a Swiss Colony created at the end of the 19th century by Swiss immigrants. Given the topographic diversity of Bariloche, hiking (Refugio Frey, Cerro Llao Llao, and Cerro Campanario are among the most popular treks) is a great place to visit.
- **Perito Moreno Glacier** is the 3rd largest ice field in the world. This glacier is unique too because it's one of the very few in the world that's actually growing. It's located in Glaciares National Park near the town of El Calafate.
- **Torres del Paine** (I know it's in Chile, but since we are so nearby, why not?) is one the most famous national park in Patagonia, home to stunning hiking trails and breathtaking viewpoints.

## • Food Recommendations (very important)

- **Asado** is a common gathering of family and friends where typical Argentine meats are cooked.
- **Provolone** - our own version of Raclette, its a disc of cheese that's cooked on the grill and then served still bubbling in a small cast iron skillet.
- **Empanada** is a half-moon shaped pastry, made from dough and usually stuffed with savory fillings. This is my all-time favorite food. Specifically, the best Empadas are from Tucuman. If someone recommends something else, don't listen to them. They don't know what they are talking about.
- **Humita** is savory steamed fresh corn cakes made from a mixture of freshly ground corn, onion, garlic, cheese, eggs, and cream, which is placed inside corn husks and steamed.
- **Dulce de leche**, a creamy caramel sauce.
- **Mate**: not the one sold in supermarkets here in Switzerland - I mean the real one.
- **Wein**, especially Malbec.



## Lowlights

- Public transport is often unreliable.
- Safety and security:
  - Though tourists are not always the main target, travelers should always take care to look after their possessions.
  - Don't flash around pricey cameras and phones. These items are expensive in Argentina and enticing for thieves.
  - If something does happen, don't fight back! Valuables can be replaced, your life cannot. Violent crimes do happen in Argentina.

## Weather

Both the hottest and the coldest temperatures ever recorded on the South American continent have occurred in Argentina. This is evident in the great diversity of the climate throughout its extension.

It's best to visit between September and April (early spring through the beginning of fall). In the end, it will depend on where you decide to go, as the weather varies from region to region. But from spring to fall, you can generally find good weather around the country.

When choosing what to pack, don't forget sunscreen, as the sun in Argentina is seriously strong.

## Good to know

- It is always useful to prepare useful phrases in Spanish. Probably in touristic places you will always find someone who can speak English. But in more rural areas it can be more complicated. Also be warned, it is spoken with an Argentinean accent that has the double l "ll" and "y" pronounced as a "sh". Also, the "vosotros" verb form is not used. Although not everyone can speak English, Argentines are very friendly people. Whenever you need assistance or directions, do not hesitate to ask for help.
- Dinner is late. Normally everyone starts dinner no earlier than 9:00 pm.
- The best way to handle your travel money in Argentina is to bring cash with you, specifically U.S. dollars or Euros. This is how you'll get the best exchange rate in Argentina. I usually recommend arriving with at least a small amount of cash, and always having cash on hand when visiting rural areas.
- ATM Machines are only found in the larger cities, they do not always work, and charge high fees.

## Do I need to get vaccinated against yellow fever?

Yellow fever vaccination is not required for entry into the country. In general, this vaccination is recommended for travellers over nine months of age travelling to the Northern parts of Argentina bordering Brazil and Paraguay (Corrientes and Misiones Provinces). Generally, not recommended for travel to the Province of Formosa and certain areas of the Provinces of Chaco, Jujuy, and Salta. Not recommended for travel limited to provinces and areas not listed above.

## What other vaccinations are recommended?

Basically, all basic vaccinations according to the Swiss vaccination schedule, as well as protection against hepatitis A and B are recommended.

## What about malaria - do I need prophylaxis?

The country is declared Malaria-free since 2019. However, you should still protect yourself against mosquitoes, as other Insect-borne diseases (including Dengue, Chagas, Chikungunya and Zika) are common in the north of Argentina and as far south as Buenos Aires and can be transmitted by mosquito bites.

## What is the best way to protect myself against mosquitoes?

Day and night you should protect yourself well against mosquitoes. It is best to wear light-colored long-sleeved clothes impregnated with insecticide (Nobite®Textile). Repellents (Anti-Brumm®, at least 30% DEET) should be applied to the skin regularly and after sunscreen. We recommend sleeping at night under (impregnated) mosquito net or with running air conditioner.

## What is the state of food hygiene on site?

Argentina has a clean water supply and good food hygiene standards in the tourist areas. Tap water is considered safe to drink in most parts of the country, but "standards" vary greatly specially in smaller towns.

Its recommended to drink only filtered water and avoid eating uncooked, raw or unboiled food ("cook it, boil it, peel it or leave it").

Typhoid fever is not endemic in Argentina but there are rare cases linked with poor food hygiene, especially in developing/rural areas. Typhoid vaccination (Vivotif®) should be carried out especially for backpackers and for long-term stays.

## Should you get vaccinated against rabies?

Vaccination before travel is highly recommended in particular for: Children under 8 years of age should be vaccinated, long-term stay (if there is a plan to travel to non-urbanized areas.), short journeys with high individual risk such as travellers on 'two wheels' or treks in remote areas and professional work with animals or cave explorers. Other cases require an individual risk assessment.

## Can I get altitude sickness in Argentina?

Si! Especially in the Northwest or if there are any mountain trekking planned. Most of these places are at least 2500 meters above sea level.

While you cannot prepare for and prevent altitude sickness ahead of time, you can work on acclimatization during the excursion. Essentially, this involves giving the body time to get used to the new oxygen content by traveling at a slow pace and remaining at certain altitudes with the body acclimates. As a general rule, once you reach an altitude of 3,000 meters, advance only 300 meters or less each day. In addition, take an extra day of rest for each subsequent 1,000 meters.

## What else do I need to know?

Hantavirus is widespread in some regions. It's spread through contact with infected rodents. Avoid contact with live or dead rodents, nests, burrows and animal faeces. Trichinellosis: Refrain from eating artisanal, non-certified or street-sold sausages. Cook pork and game thoroughly before eating. Trichinae are killed by heating above 70°C for more than 1 minute. Smoking, curing and drying are not safe measures to kill larvae.

## Have a great trip!

# Wanderlust Chronicles - Episode 2 - Peru

Jenny Crawford moved with her family to Switzerland in June 2018. Before joining EBPI, Jenny worked as a Program Manager at the University of California, San Francisco's medical school. Previous to her role at UCSF, Jenny worked as a Sexual Health Educator and a Spanish teacher. In her position as Business Manager, Jenny is responsible for external communication, financial controlling and business development and strategy for the Travel Clinic.

In this post she takes us on her trip to Peru in 2007 and shares her unforgettable impressions.



Jenny Crawford

Travel Clinic UZH

## Why Peru?

I went to Peru when I graduated college. In fact, with a hubris only found when one is 22 (cue Taylor Swift's "22" - "we're happy, free, confused, and lonely at the same time. It's miserable and magical, oh yeah"), I graduated college a quarter early in order to travel to Peru. I am not sure where I got the idea, having grown up in Ohio it was not the foremost place to visit. But I was a Spanish major with a small history obsession who wanted to learn more of the once invincible Incas.

As this is meant to be a travel guide, I will focus on what I remember doing and what I enjoyed while there. But because I am an oversharer, I will also share a bit of what it was like to be living abroad, mostly alone, for the first time since that colored so much of what Peru was like for me. I was also heartbroken, I mean really heartbroken, for the first time. Some memories of my time there are as clear as if they happened yesterday rather than 17 years ago. Others are fuzzy, more recollections of feelings, a smell or taste, mere snapshots of a place in time.

## Preparation

Being a native English speaker and a budding teacher low on funds, I figured the best way to be able to go to Peru for an extended period was to go as an English teacher. So that is what I did. I found a TEFL course, enrolled and bought a plane ticket. There was not much planning or thought that went into it beyond that. Again, hubris. My 39-year-old anxious self now puts more thought into which tomatoes to buy for dinner than I did for that trip. I would encourage slightly more preparation :-)

While not generally prepared for my trip, I did go to a Travel Medicine specialist for the first time before my trip to Peru (perhaps foreshadowing my future role at a travel clinic). I was recommended a yellow fever shot and malaria medication, which I took. Healthy Travel recommends the following vaccinations for Peru currently. Since the TEFL course was in Cusco, that is where I focused my trip, though I did fly in and out of Lima. I arrived in Lima, bookeared copy of "Eat, Pray, Love" in hand, at the end of February, I think, and spent about 4 days there.

I remember very little of what I did in Lima, but that was likely not Lima's fault. I was anxious to get to where I would be living. I do remember not feeling particularly safe there but as a 22-year-old female travelling by herself, that probably would have been true in most places. I flew from Lima to Cusco and was quickly shuttled to the small two room apartment the school provided for me. It was about a 30-minute walk from the school, which was situated just off the Plaza de Armas.

## Cusco

I arrived a few weeks before school started and intended to use that time to explore Cusco and do a few of the touristy things in the immediate vicinity of Cusco. I decided to save the world-famous trek to Macchu Picchu for after I was done teaching. Cusco is an amazing city for several reasons:

1. **Historical Significance:** Cusco was the capital of the Inca Empire, the largest pre-Columbian civilization in the Americas. The city's rich history is evident in its well-preserved archaeological sites, impressive Inca stonework, and colonial architecture.
2. **Gateway to Machu Picchu:** Cusco serves as the gateway to the legendary Machu Picchu, one of the New Seven Wonders of the World.
3. **Cultural Fusion:** Cusco is a vibrant blend of Inca heritage and Spanish colonial influences. This fusion is evident in the city's architecture, traditions, and festivals. The mix of indigenous Quechua culture and colonial charm creates a unique and captivating atmosphere, offering visitors a glimpse into Peru's diverse cultural tapestry.
4. **Vibrant Markets:** Cusco is home to bustling markets, such as the San Pedro Market and the traditional Sunday market in Pisac.
5. **Natural Beauty:** Nestled in the Andes Mountains, Cusco boasts stunning natural landscapes that surround the city. From the breathtaking Sacred Valley to snow-capped peaks and tranquil lakes, the region offers abundant opportunities for outdoor adventures like hiking, mountain biking, and exploring remote villages.



## Altitude Sickness

Unfortunately, altitude sickness hit me hard soon after I arrived to Cusco (my symptoms were headaches, fatigue, nausea and loss of appetite). Whether for lack of advice or lack of listening, I was caught off guard and unprepared for the effects (Cusco is situated at 3`399 meters above sea level). Luckily the man who set me up in my apartment introduced me to the magic of Coca leaves. Some find them bitter, and I suppose they are, but there is a great sort of minty umami flavor accompanying them. I gorged myself as I found it the only way to alleviate my headache. I drank tea, had coca candy and sometimes just chewed the leaves. It helped and I was able to slowly ease into Cusco by simply walking around the city (Cusco is an eminently walkable city (from my memories)). While I was obviously a tourist, I don't remember being overwhelmed or taken advantage of. In the touristy areas of course there were vendors aggressively selling goods, but mostly beyond that I felt safe and almost ignored, in a way I enjoyed.



## Food and Drinks

I explored many of the little restaurants and coffee shops which offered extremely yummy food at a low price. I never had any issues with my stomach, once I got over my altitude sickness. I remember the food being mostly vegetarian and full of lots of legumes, corn, vegetables and tubers. Extremely good. Of course, the famous Anticuchos (beef heart) or Cuy (guinea pig) was available, but I avoided that until the end of my trip when my desire to get the "full Peruvian experience" outweighed my discomfort eating a tiny grilled guinea pig, which often was served to tourists sporting a tiny hat carved from a tomato. While not my personal favorite (it tastes a bit like greasy, dark meat chicken), guinea pigs continue to be an important protein source in the region and most households in the Andean highlands raise the animal.

However the vegetarian food, ceviche and Pisco Sours (of course) are where Peruvian food shines, at least for me. Corn is an important staple and some of my favorite corn-based dishes include Chicha de Jora, which is a drink made from yellow maize that has a pale, milky, yellow color and tastes slightly sour (much like hard apple cider), and a purple jelly-like dessert called Chicha Morada, which gets its color from purple corn (though I have since learned that this can also be served in drink form).



## Sacred Valley - Area Surrounding Cusco

After a few days I began to feel better and made use of my free time to explore some of the local Incan ruins in the areas around Cusco. In this time I visited:

- Ollantaytambo
- Sacsayhuamán
- Salineras de Maras (Maras Salt Mines)
- Alpacas of Awana Kancha

To book these tours I utilized some of the many tourist offices available in Cusco. I do not remember the specifics of any of the tours I took, but I enjoyed them all and found them all well organised and awe-inspiring. Later I got a bit more adventurous in traveling on my own, and found Cusco and Perú in general pretty easy to navigate by bus. Here a few snapshots from this time:



I also visited some of the local museums, both of which I would recommend but especially the Museum of Pre-Colombian Art:

- Inka Museum
- Museum of Pre-Colombian Art

Of course just walking around the city one can see its history. Long before the arrival of the Spanish conquistadors, Cusco flourished under Inca rule, with intricate stone temples, palaces, and terraced gardens gracing its landscape, much of which are visible to this day. In 1533, the Spanish conquistador, Francisco Pizarro, and his men invaded the Inca Empire, bringing with them destruction and upheaval. The Spanish conquerors dismantled many Inca structures, replacing them with their own colonial architecture. However, despite the devastating consequences of colonization, the indigenous people in the region were able to preserve their cultural traditions and blended them with elements of the Spanish influence. The city of Cusco is a living testament to this cultural fusion, a place where ancient Inca ruins stand alongside Spanish cathedrals, forming a unique and captivating architectural tapestry.

## School and Daily Life

Once school started, I mostly just went to school and taught English and went to bed tired each night. I made some friends, and if we went out at night, it was mostly to play cards or dance at one of the bars in the Plaza. I enjoyed the international feel at the school, where other languages besides English were also taught. I took a few weekend trips, but school was intense- how does one explain the difference between lay vs lie when one barely understands the difference themselves? Towards the end of my time at the school, when it was more teaching-based rather than learning-based, I had more time to explore.

## Lake Titicaca

One of these weekends, I took an overnight bus trip with a friend from South Korea to spend a night near the island Amantani on an island with no electricity in Lake Titicaca, the world's highest navigable lake. On the way we visited the floating homes and reed boats of the Uros people.



At night on the island, we stayed in the home of a local family, and it was my first time staying somewhere without electricity (other than camping). It was one of my favorite experiences. At night I just sat and watched the moon glisten over the lake without the interference of artificial light. I felt like I was witnessing heaven on earth.

I finished school and taught for only a little over a month (I was covering someones classes while they travelled). At that time, I had already decided to return to Ohio and start graduate school to get my Master of Education. While teaching English I taught all ages, from kids to adults, but the teens were my favorite and that is ultimately who I ended up teaching once I returned to the states :-)

## Machu Picchu - Salkantay Trek

Before I left though, it was time to see Machu Picchu. I decided to do the 5-Day Salkantay Trek rather than the more popular Inca trail and I am glad I did. The Salkantay Trek is named after the mountain that the trail passes, Salkantay Mountain, though you`ll pass by glaciers and a tropical Andean forest on the way (including coffee plants). It is longer and more strenuous than the Inca Trail, but oh so worth it as long as you are someone who likes to hike. The trek is around 74 km (46 miles) long and is most commonly done over 4-5 days (with visiting Machu Picchu on Day 5). Day 2 is the most challenging day that takes most people around 9 hours. It climbs 600 meters in elevation and then descends 1,780 m over 22 kilometers. This is a full and challenging day of hiking, but it is also rewarding and beautiful.

The trek holds historical significance, and like the Inca Trail, was a route the Incas once took to get to Machu Picchu. The main difference is that the Salkantay Trek is

through the mountains reaching nearly 4,600m above sea level, whereas the Inca Trail is walking on ruins much of the way. I did not get sick at that altitude, but I had already been living at altitude for a few months at that time, so consider that before your trip. One man from our group had to be carried down by a guide because he got so ill.

It is said that the Salkantay Trek was the route that religious leaders took to get to Machu Picchu because the high elevations brought them "closer to god."

When I did the trek, I was in a group of about 7 other people and our guides. You carry your gear, but the food and tent are carried by the guides (ours used horses to help carry the load when possible). I think different tours offer varying levels of quality for the food and tents. The food and tents on my tour were simple, but definitely more than enough. Unfortunately, I cannot remember the name of the company with whom I toured. There are small little stores along the way where one can buy snacks if needed (I may or may not have splurged on a ridiculously expensive Snickers bar after the exhausting Day 2 stretch).

Be prepared for all weather since it snowed when I did the hike, which I think was a bit unusual but not unheard of (followed by sticky hot tropical forest days).



I was a single woman, in a group, alone but not lonely, in mountains that somehow simultaneously felt intangible and as if I could just reach out to touch them. It was a time of extreme introspection coupled with physical exertion, as my most favorite memories tend to be.

At the end of the Trek, you end up in Aguas Calientes and spend the night in a hotel organised by the trek company (after 4 days of hiking and camping, that shower is necessary) and wake up early to be the first to reach Machu Picchu where you see the sun rise over the ruins. You can climb up the separate mountain near Machu Picchu called Huayna Picchu, which I recommend doing if you are fit enough (you need a rope to pull yourself up in certain sections since it is so steep and it can be a bit slippery on the way down).

I have now been to a few of the other 7 world wonders, but non compare to Machu Picchu to me. Please respect it if you go so that it's the same magical experience for future generations.

## Final Thoughts

After the trek, I returned to Cusco, packed and flew back home. The same but different. Half a year away but a lifetime of memories made.

What do I remember about my time in Peru? As I mentioned, I loved the food and the people. I don't remember speaking a lot of English, besides when I was at school, but found the Spanish easy to understand with a clear accent (Quechua is also spoken in certain areas). The mountains are unbelievable (maybe not a surprise that I ultimately ended up in Switzerland). My time there healed me in a way for which I will forever be grateful.

Would I recommend it? Absolutely. One can't help but feel a sense of awe and wonder. The history of the Incas and the magic of the mountains intertwine, reminding us that in Peru the past and the present exist in harmonious co-existence, forever preserving the ancient legacy of a place where the extraordinary is ordinary.

But don't be insensitive. Learn about the local culture and customs. Try the food for the experience not the novelty. Appreciate the culture and artistry of the people without exploiting their work. Be cognizant to the impact of your travel and leave the trails as you found them. Then come back and tell me about it :-)



## Weather

A note on the weather, since I know Swiss people love talking about the weather :-)

Cusco experiences a distinct wet and dry season, with weather patterns influenced by its high altitude and proximity to the Andes Mountains. From February to July, Cusco transitions from the rainy season to the drier months. Here's a breakdown of the weather you can generally expect during this period:

### February and March:

- These months mark the tail end of the rainy season in Cusco.
- Expect a mix of sunny days, intermittent rainfall, and cooler temperatures.
- Daytime temperatures typically range from 15°C to 20°C (59°F to 68°F), while nights can be chilly, dropping to around 8°C to 10°C (46°F to 50°F).

### April and May:

- Cusco experiences a transition period during these months, with decreasing rainfall and increasing periods of sunshine.
- The weather becomes milder, with warmer days and cooler nights.
- Daytime temperatures range from 15°C to 22°C (59°F to 72°F), and nighttime temperatures can drop to around 5°C to 10°C (41°F to 50°F).

### June und July:

- These months fall within Cusco's dry season, characterized by sunny days and cold nights.
- It is the peak tourist season, particularly in June when the Inti Raymi festival takes place.
- Daytime temperatures range from 15°C to 20°C (59°F to 68°F), while nights can be significantly colder, dropping to around 0°C to 5°C (32°F to 41°F).

Overall, it's important to note that Cusco's weather can be unpredictable, and even during the dry season, short periods of rain are possible. It's advisable to pack layers and be prepared for temperature variations throughout the day. Additionally, higher elevations, such as Machu Picchu or other mountainous areas around Cusco, may have slightly different weather conditions and cooler temperatures.

When planning your trip, it's always a good idea to check the weather forecast and pack accordingly to ensure a comfortable and enjoyable experience in Cusco.

### Have a good trip!



# Yellow Fever and Its Nobel Prize-Winning Vaccine

Yellow fever has a long history, with its first recorded epidemic in the Yucatan Peninsula in 1648, although scientists suspect that it has been around since the 1,000s. Its history has not always been pleasant, but scientific advances less than a century ago produced the yellow fever vaccine, a highly effective form of protection. Let's take a look at the history of yellow fever, and what you can do to protect yourself from this disease when travelling.



## The History of Yellow Fever

For centuries, yellow fever has been one of the most feared diseases because of how lethal it is and how, for a long time, very little was understood about it.

Let's go back in time to understand this better. Your village in the 1700s gets its first case of yellow fever, and slowly one person after another falls victim to it. No one knows if it is passed through touch, air, or other means. Many people would do all they could to protect themselves without knowing what would work, and for many they still contracted the disease. It was a scary time, which explains why it is such a feared disease.

Thankfully, we now know more about the disease than our ancestors. For example, by the 19th century, scientists knew that yellow fever was not transmitted through person-to-person contact. However, the most popular theory at this time was that yellow fever was related to atmospheric miasmata, or air pollution. This theory likely developed because the disease flourished in urban settings.

## A Mode of Transmission

The end of the 19th century brought a war between the US and Spain, where the US invaded Cuba. However, this war saw immense losses, with 13 soldiers dying of yellow fever for every one soldier dying in battle. These massive losses spurred an investigation into the cause of yellow fever, where it was discovered that yellow fever is primarily transmitted through the *Aedes aegypti* mosquitoes.

## Eliminating Urban Cases

In 1915 a Yellow Fever Commission was established to eliminate breeding places for the *Aedes aegypti* mosquito in the areas where transmission often occurred. In many cases, it was highly effective, yet the disease remained in other sites. In the 1930s it was found that the yellow fever virus originated from monkeys: they were bit by mosquitoes who then bit humans, passing along the virus. The virus could then spread further especially in large urban areas with a concentrated population.

## Viral Advances

In 1927 Adrian Stokes isolated the virus responsible for yellow fever from a 28-year-old sick man in Ghana who was able to provide his blood as a sample. The isolated virus was named the Asibi strain in recognition of the man it was retrieved from. This isolation stood as the basis for the yellow fever vaccine still used to this day.

## The Yellow Fever Vaccine

In 1937, Max Theiler created a vaccine for yellow fever that effectively eliminated urban forms of the disease. However, epidemics in jungle locations still occurred in the tropical belts of Africa and the Americas.

The yellow fever vaccine stems from Theiler's development of the 17D strain of attenuated viruses. The 17D strain was achieved by passaging the viral strain isolated by Adrian Stokes more than 200 times in cell cultures. Testing on this strain revealed that the virus had been weakened but could still induce a protective immune response in both monkeys and humans.

Max Theiler received a Nobel Prize in Physiology or Medicine in 1951 for his discovery of a vaccine against yellow fever. As of this point, it is also the only Nobel Prize awarded for a virus vaccine (although the recent work on the COVID-19 vaccine may soon join these ranks).

Theiler had been nominated for a Nobel prize many times before winning in 1951. In 1937 he was nominated for his work on yellow fever in mice. His next nomination came in 1948 with the yellow fever vaccine development as the core reason. In fact, this nomination came from Albert Sabin, a man who later went on to develop the polio vaccine.

Despite the impressive examples of his work, the committee passed on awarding the Nobel prize to Theiler in both 1937 and 1948. However, in 1951 Theiler finally won the Nobel Prize due to a last-minute nomination from the committee's chairman.

## How Does Yellow Fever Spread?

Yellow fever is a mosquito-borne disease that occurs in sub-Saharan Africa and South America. While transmission can occur throughout the year, it may peak during the rainy season.

The mosquito which transmits yellow fever, is mainly *Aedes aegypti*. The mosquito is active both day and night, most commonly at dusk and dawn.

## Symptoms of Yellow Fever

Most people with yellow fever have mild or no symptoms and recover completely.

However, some people may develop symptoms that appear within 3-6 days of the bite and can include:

- fever
- chills
- headache
- muscle aches
- backache

After a brief remission, 10-20% of those who get yellow fever develop a severe form of the illness that can cause high fever, internal bleeding, shock, organ failure, and thereby yellow skin and eyes. The mortality rate of severe cases is 30-60%.

## Treatment

There is no treatment specific for yellow fever. Instead, treatment focuses on relieving symptoms, providing fluids, and lowering a fever.

## How To Protect Yourself from Yellow Fever

Because yellow fever is a potentially lethal disease, it is important to protect yourself when traveling to areas of risk.

## Vaccinate

The yellow fever vaccine offers very high protection from yellow fever. Because of the long-term protection it provides, it is recommended for anyone older than nine months who are traveling to a yellow fever endemic area. Additionally, some of these locations may require proof of vaccination against yellow fever before entering.

Most individuals are protected around 10 days after the first vaccination. Side effects of the vaccination are typically mild and they may include muscle aches, headaches, and low-grade fevers. On rare occasions, someone may develop a severe reaction to the vaccine that can be life-threatening. This is why it is used with caution on those who are immunocompromised, pregnant, or elderly.

## Keep Away Mosquitoes

In addition to the vaccine, it is also recommended to protect yourself from mosquito bites. This can include using mosquito netting when sleeping, wearing long pants and shirts, and using mosquito repellent spray on any exposed skin.

## Be Vigilant Against Yellow Fever

While yellow fever is no longer the epidemic it once was, it can still cause a severe infection if you do not properly protect yourself from it. The yellow fever vaccine is one of the best forms of protection, and proof that if at first you don't succeed in getting the Nobel prize, try, try again.

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### References

Health risks – HealthyTravel.ch. (2022). Retrieved 17 June 2022, from <https://www.healthytravel.ch/health-risks/>

Staples, J. (2008). Yellow Fever: 100 Years of Discovery. *JAMA*, 300(8), 960. doi: 10.1001/jama.300.8.960

Frierson J. G. (2010). The yellow fever vaccine: a history. *The Yale journal of biology and medicine*, 83(2), 77–85.

Norby, E. (2007). Yellow fever and Max Theiler: the only Nobel Prize for a virus vaccine. *Journal Of Experimental Medicine*, 204(12), 2779-2784. doi: 10.1084/jem.20072290

# «Sometimes mountaineering feels like a drug to me!»

Susi Kriemler is a pediatrician, sports medicine specialist and epidemiologist who conducts research at the University of Zurich. Her research focuses on the physical activity and health of children and adolescents and, since she herself likes to climb high peaks, also on high-altitude medicine.



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Altitude medicine is a branch of mountain medicine that deals with the health effects of high altitudes on humans. This includes altitude sickness, which can occur at high altitudes if acclimatization is inadequate and can be life-threatening in severe cases.

In this article, you will find out why caution is required even on family excursions to the Jungfrauojoch, and how women and men react differently to stays at high altitudes.

## You have experience with hiking in high mountain regions. How did you get into mountaineering?

In college, I started climbing, ski touring and mountaineering out of a fascination. Then I met my husband, who was also a mountaineer. We started a family and took the

children with us everywhere. We also went with them to Everest Base Camp for example and lived there at 4200m for three months. We treated people who were sick at high altitudes and offered family medical treatment for the local population.

I find mountaineering something absolutely beautiful and could no longer live without it. Even as a 60+, the enthusiasm has hardly diminished, except for maybe the musty, crowded camps that you visit when mountaineering.

## Which peaks have you already conquered and what exactly fascinates you about high mountains?

There are many around the world, including the Matterhorn, the Weisshorn or the Biancograt in Switzerland, Kilimanjaro in Africa or Denali (formerly Mount McKinley) in Alaska. What fascinates me? Of course the mountains themselves, the nature that shows us how small and also helpless we are in this powerful nature, the adventure, and lastly the activity itself that teaches us where our limits are. Sometimes mountaineering feels like a drug to me - some drink alcohol, others climb high peaks.

## Health risks can certainly be understood as limits. Among them is altitude sickness. What is that exactly?

Altitude sickness is a symptom complex that can be distinguished between 3 different conditions:

1. acute mountain sickness, also called **AMS**
2. high altitude pulmonary edema, also called **HAPE**
3. and high altitude cerebral edema, also called **HACE**

By far the most common is AMS. You can imagine a hang-over after a boozy evening with too much alcohol: You feel floppy, tired, a little dizzy, you feel a little "woozy," you have no appetite, and you suffer from a headache. That's exactly what AMS feels like.

Much rarer, but much more dangerous are HAPE and HACE. These are dangerous conditions that are life threatening if not treated immediately. HAPE is pulmonary edema, which as the word explains, is accompanied by water in the lungs. This results in a lack of oxygen flow. Oxygen is important for maintaining the function of every single cell in the body. Symptoms of HAPE include fatigue and shortness of breath- people simply can't take any more.

HACE is the counterpart to the brain, so an accumulation of water in the brain. This, too, leads to undersupply of oxygen to the brain, but also to increased intracranial pressure. When water suddenly accumulates within the skull to an increased degree, there is too little room for the brain itself, and there is increased pressure. This is accompanied by severe headaches, nausea, vomiting, and impaired consciousness and is, as mentioned, life-threatening.

### Who is at risk?

Actually quite simple. The following applies to all three diseases: if you ascend too high too quickly, you will become ill. AMS starts at an altitude of 2500m. This altitude is reached in many mountain regions of Switzerland. HAPE and HACE usually only occur at higher altitudes of 4000m and above, i.e. rather on expeditions in higher areas of the world, such as the Himalayas, Kenya, Aconcagua, Denali and Elbrus, i.e. everywhere where the altitude is far above 4000m.

There is a risk for everyone who disregards the rules. Our rules to prevent altitude sickness are: once you're at 2500m, do not ascend more than 300-500m per day. The decisive factor is the sleeping altitude. For all diseases, there are people who are particularly susceptible. The

reasons for this have not yet been fully researched, but in principle, once you get altitude sickness, you will get altitude sickness again. This risk of recurrence is particularly pronounced in the case of HAPE.

### How dangerous is altitude sickness?

AMS is harmless in mild form but in severe disease it can progress into HACE, in which case it becomes life-threatening. HAPE, once present, is also life-threatening.

### To what extent does age or pre-existing conditions play a role?

Age does not play a role in this sense. The above-mentioned risks exist equally for all age groups. Many chronic diseases, on the other hand, naturally increase the health risk at high altitudes. This is a vast area but basically it can be said that chronic diseases, in which oxygen plays an important role, carry a particularly high risk.

### Does physical fitness matter?

Yes and no, there are controversial opinions on this. Fitness does not play a role in large epidemiological studies. Nevertheless, there are studies that show that fit climbers or trekkers are more likely to get sick at altitude than less fit climbers. This probably has to do with the fact that fit climbers are more likely to overexert and push themselves to their limits. It is extremely important to give the body time to get used to the unusual altitude - this is called acclimatization.

We are a marvel of nature. Our body has various mechanisms in store to optimize survival in an unfamiliar environment. So when the partial pressure of oxygen drops at altitude, the body cannot take in as much oxygen from the environment as it would need. In acclimatization, therefore, the body begins to breathe more, the kidney adjusts the acid balance, and more red blood cells are produced. The whole system is rearranged so that more oxygen can be absorbed into the blood and transported to the tissues.

But this takes time and the body must not be overstressed in these situations. Of course, it is always good to bring a high level of fitness, so there are reserves for the considerable physical effort. However, macho behavior should be left at home during the acclimatization phase.

## Couldn't it also be the case that more fit people climb to high altitudes and thus more fit people get sick?

This is also possible, and would certainly have to be investigated in more detail.



## Why is the sleeping height and not the height at which you stay during the day the decisive factor?

The development of altitude sickness takes time, certainly 4 hours and more, until it occurs. So, climbing higher in the short term, for example a day trip to the Jungfrauoch, has no effect. But again: it is important not to overtax the body in the process.

## What should you do when you get sick?

If the AMS is mild or moderate, a day of rest can help. If the condition does not improve, descent must be made until the symptoms resolve. A severe AMS must be treated, and you have to descend immediately. Often 500-1000 meters of descent is sufficient in the Alps, but this depends on the altitude at which the condition occurred. HAPE and HACE are life threatening, must be treated immediately and whenever possible a passive descent is essential. Passive because this does not further stress the body and deprive the body of oxygen due to the effort of the descent.

## Can altitude sickness be prevented with medication?

Yes, it can. Especially for people who get sick every time they go up to altitude. The drug of choice for AMS is Diamox, a drug that increases respiration and interferes with the acid-base balance of the body. For HAPE, there is nifedipine, and for HACE, dexamethasone. For all medications, however, a consultation with a specialist is needed; they cannot simply be bought at the pharmacy without a prescription.

Another form of prevention is pre-acclimatization. For this, you have to sleep at high altitudes at a comparable altitude in the 1-2 months before the expedition. The longer you do this, the better you are acclimatized. Not too much time should pass between acclimatization and expedition, because you can lose the acclimatization again when you descend.

## What should be in an emergency first-aid kit for a high-altitude hike?

For non-professionals, nothing special is needed, perhaps a painkiller, which can then be used for headaches. However, if you are traveling to areas where a doctor will not be readily available, you should get a travel medicine consultation before traveling. There you can get one of the drugs mentioned above, but also an antibiotic for bacterial infections, and of course it's always a good idea to check your vaccination status.

## In 2005, you co-published an interesting paper, «Medical Recommendations for Women Going to Altitude»[1]. You found that there are quite a few differences between the sexes in terms of altitude sickness and acclimatization. Can you tell us something about that?

We are in the process of revising these recommendations, as much of the research is now better understood. This year and next year we will publish some research results on this topic. Basically, there are no differences between women and men in terms of acclimatization, AMS and HACE. However, HAPE clearly occurs more often in men than in women. We do not yet know why. Part of it may be related to the fact that women still climb high mountains less frequently than men. Perhaps macho behavior in men also plays a role, and there may also be physiological differences. We simply don't know yet.

## You've also found that going up into the high mountains can have an effect on the menstrual cycle. How so?

Mountaineering is a stress for the human body. The menstrual cycle is very sensitive to stress. In other words, it gets confused. Often menstrual bleeding stops because the body saves energy where it can be easily saved. The stress is not only due to the oxygen deficit when climbing to high altitudes, but also due to traveling in general, time changes, cold, physical exertion, a different diet and so on.

Something else that is very important: no menstruation does not mean that you cannot get pregnant. Therefore, you must use contraception even if your periods stop. And no menstruation does not mean that it cannot suddenly occur again. You have to be prepared for that. Menstruation can be a challenge, especially on long expeditions in the high mountains, where you sleep in tents and the hygiene situation is difficult without access to running water.

## Apparently hormonal contraception has an impact on the risk of thrombosis at high altitudes?

Menstruation in hygienically critical situations is a "necessary evil", if I may say so. One can stop it with a contraceptive pill, which one then simply takes during the entire time of the stay at altitude. Different pills have different compositions of estrogen and progesterone, the market is huge. It has been seen in large epidemiological studies that certain contraceptive pills carry a different risk of thrombosis depending on their composition, incidentally quite independent of the altitude of stay. Although there is always a risk of thrombosis when taking the pill, nowadays it can be assumed that the pill with the lowest possible risk is always prescribed.

In general, regarding the risk of thrombosis at altitude, it can be said that if someone has been taking the pill for years, there is not suddenly an increased risk of thrombosis when this person goes up into the high mountains and continues to take the pill. In addition, other factors can also influence the risk of thrombosis in the high mountains, such as the cold, the thickening of blood due to the increased production of red blood cells or dehydration.

## Apparently, iron levels can affect acclimatization. What does that mean?

Actually, it's quite simple. Iron is an important component of red blood cells. Iron is, so to speak, the carrier substance for oxygen in the blood cells. If iron is missing there, the transport of oxygen from the lungs to the tissues can no longer take place optimally, the transport is disturbed. It is therefore important, especially for pre-menopausal women (who often suffer from iron deficiency due to regular bleeding), that they start their journey with sufficient reserves. A brief check with your family doctor is advisable here, especially before longer trips to high altitudes. For short-term stays, a possible deficit of iron plays a minor role.



## What other risks should not be forgotten when hiking in high mountains?

Accidents of any kind are probably the greatest risk. Today, an infinite number of people climb high mountains, and among them are also many who do so more or less unprepared and "mindless". They don't have good clothes against the weather, they don't have good shoes, they don't have a bivouac bag against the cold, they don't have emergency provisions if they get stuck somewhere, they don't have enough liquids with them, they don't know the emergency call, and they can't judge the terrain for dangers.

There are moments of danger without end and many amateur mountaineers underestimate them in the high mountains. Good preparation is therefore an absolute "must". Acquiring all the good tricks in a mountaineering school would be an ideal alternative, wouldn't it?

## Of course, you've also published quite a bit on children in high mountains. What are the most important takeaways here?

Yes, you don't always have to think of long expeditions in the Himalayas when you think of altitude sickness because high peaks are very easy to reach in Switzerland thanks to all the mountain railroads and are also popular family destinations. For example, a family trip to the Jungfrau-joch with an overnight stay in the Mönchsjoche already requires appropriate preparation because this is located at over 3500m. Parents are responsible for acclimatizing their children so that they do not fall ill.

We conducted one of the largest studies with children and adolescents on Jungfrau-joch. There we found that children and adolescents were no more susceptible to altitude sickness than adults. So there are no significant differences. Or to put it another way, children get altitude sickness just the same. For me, it is important to protect them from this as much as possible. This means following the guidelines of acclimatization: from 2500m, do not add more than 300-500m of sleep altitude and take a rest day every 3-4 days. And in addition: Challenge children, but don't overchallenge them. The mountains should be a positive experience, not a drudgery with altitude sickness. There is a good article on this that we wrote a few years ago, everything in it still applies today.

## Are there any other issues, organizations or projects you'd like to bring attention to?

Yes, there is a very recent publication by Peter Hackett and David Shlim, two of the original scientists on altitude sickness, who conducted the first major epidemiological studies. For those who would like to learn more about high altitude travel and altitude sickness, I recommend their chapter in the CDC Yellow Book.

Additionally, I am part of a group of about 10 mountaineering women from different countries around the world, who are scientifically active and carry out a project under the label of the UIAA (Union Internationale des Associations d'Alpinisme[2]), in which mountaineering women are taken into focus. We are currently in the process of writing articles on various topics, including those specific to women such as pregnancy, menopause, contraception, and dealing with menses while mountaineering. We are also working on chapters on gender differences in altitude sickness, nutrition, frostbites and fatalities in the mountains. The first articles will be published later this year, and a non-expert version of each scientific publication will also be published on the UIAA website.

## What a great project! We are looking forward to the upcoming publications. Thank you very much for the interesting interview.

**Interview: Cécile Rasi**

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