



Improving Health Disaster Risk Management with Indigenous Peoples:

Methodology for Simulation Exercises
Using Parallel Perspectives



Pan American
Health
Organization



World Health
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I. Background on Health Disaster Risk Management with Indigenous Peoples

Based on the latest censuses available in the Region of the Americas (2010), there are approximately 42 million Indigenous Peoples in Latin America, representing nearly 8 percent of the total population. They make up approximately 17% of the total population living in extreme poverty, leaving them increasingly vulnerable to the public health impacts of disease outbreaks, emergencies, and disasters (World Bank, 2015; IASG, 2014). Additionally, poor housing, a lack of access to medical care, cultural and language differences, and geographic remoteness contribute to their escalating vulnerability.

Yet for centuries, indigenous peoples around the world have used their traditional knowledge to prepare for, cope with, and survive disasters. This knowledge has arisen from the close relationship these communities have with the environment, as well as their cultural beliefs and common sense of community (Scott, et al., 2013). Their methods and practices originated within their communities and have been maintained and passed down over generations. Today, many of these traditional practices are considered important and necessary contributions to the conservation of biodiversity and environmental sustainability.

Several recent policy documents of the Pan American Health Organization point to the importance of integrating indigenous knowledge and health disaster risk management. PAHO's Plan of Action for Disaster Risk Reduction 2016-2021 and its Policy on Ethnicity and Health urge Member States to consider the connection between the two and to promote an intercultural approach. Together, these documents provide a unique framework for integrating health disaster risk management with local indigenous knowledge.

One important factor of successfully integrating indigenous knowledge into disaster risk reduction practices is to consider the perceptions of risk, hazards, and vulnerability from the standpoint of all who face or will be called to respond to a determined event. The methodology described in this document takes a first step toward this objective. It presents a simulated description of events – a type of natural disaster and a biological health emergency—from two distinct perspectives.

II. Objective of this Document

The objective of this document is to adapt the rationale and the methodology for conducting a simulation exercise so that the discussion leads to improved disaster risk management, post-emergency interventions, and health outcomes for indigenous peoples.

To achieve this objective, hypothetical scenarios are developed in which the same facts and occurrences are presented, both from a traditional perspective as well as from a perspective that reflects an indigenous cosmovision. Consult chapter V, as well as the materials in the Annex, for further information.

The materials in this document complement the information provided in the Pan American Health Organization's **Guidance Note on Health Disaster Risk Management with Indigenous Peoples**.

The use of scenarios with parallel perspectives in a simulated health emergency helps participants to see that the exercise is appropriately realistic for all participants involved—both health practitioners and members of indigenous communities.

III. What are Simulation Exercises and Why are they Important?

According to the World Health Organization (WHO, 2017), a simulation exercise is a form of practice, training, and monitoring the capabilities of the participants to respond to a simulated description of an emergency. In the context of this document, the participants are members of indigenous communities (in a variety of positions); health officials (at a variety of levels, as appropriate to the situation); and potentially other organizations (local NGOs, for instance) that have working relationships with Indigenous Peoples.

Simulation exercises enable people to practice their roles and functions. They also help to develop, assess and test functional capabilities of emergency systems, procedures and mechanisms to respond to outbreaks and public health emergencies. They are used to identify gaps and enhance preparedness capacity for response before an actual emergency occurs.

This methodology uses, as examples, two tabletop simulation exercises for developing exercises that incorporate a traditional and an indigenous perspective. They are designed to stimulate constructive dialogue among the participants (participants are divided into groups that ensure a representation of backgrounds) who often view the same occurrence through a different lens. This process is intended to identify and resolve problems and to update existing operational plans.

IV. Preparing for a Simulation Exercise Using Parallel Perspectives

Before developing or carrying out a simulation exercise, the following matters should be discussed and agreed upon.

- **The commitment of indigenous leaders and the community** is critical. The community itself must give a clear mandate to the organizers of the simulation exercise to plan, implement and evaluate the exercise. Arguably, this important step will be made easier if there has been substantial interaction on a number of fronts between national authorities (if they are the organizers) and the community. It is important that everyone understands the purpose, the benefits, and expected outcomes of the exercise (WHO, 2014).
- **An assessment of the needs** of the population. In order to be effective, an exercise should be constructed around the findings of an assessment of needs, including an understanding of the demographics and social aspects of the community and the priority risks it faces.
- **Agreement on the purpose of the exercise:** When preparing an exercise, focus should be on the overarching reason for undertaking the exercise. This step will help define the scope, and relates to the type of exercise (e.g. range of different sectors involved, number of participants, etc.). The exercise objectives are the foundation of the exercise, as they describe the specific outcomes to be achieved and evaluated. In order to ensure the exercise achieves its stated purpose, it is important to define the scope clearly and set the right objectives (WHO, 2017).



V. One Reality, Two Perspectives: Developing Simulation Exercises Using Parallel Perspectives

This document will look at brief examples from two short tabletop simulation exercises: the lead up to and aftermath of a volcanic eruption and a potential health emergency driven by the migration of indigenous peoples to a neighboring country, only to face health risks in their new location. The estimated length of the exercise is approximately 90 minutes.

A tabletop exercise uses a progressive simulated scenario, together with series of scripted tasks, to make participants consider the impact of a potential health emergency on existing plans, procedures and capacities. It is a discussion of an emergency situation, generally in an informal, low-stress environment. It is designed to elicit constructive dialogue between participants; to identify and resolve problems; and to review or refine existing operational plans (WHO, 2017).

In this methodology, we present a simplified introduction to preparing a tabletop simulation exercise that will be carried out with the participation of a) national/local health professionals and b) leaders/ members of Indigenous Peoples or organizations that work in the community. The exercise represents one single emergency scenario that is viewed through the lens (or perspective) of these two different groups.

Developing a Realistic and Appropriate Scenario

Preparing for this simulation exercise begins with developing a realistic and appropriate scenario (or narrative) of the simulated emergency. The scenario narrative will describe an emergency situation that enables the participants to immerse themselves in the events and discuss the planned questions/ tasks that the facilitator poses to the group(s). Adding a parallel perspective that reflects the beliefs of the indigenous population further refines the scenario. Because the indigenous population's worldview often dictates how they consider natural hazards and risk, the use of parallel perspectives to describe the evolution of an event is designed to broaden the discussion and suggest interventions and solutions to mitigate the health impact of disasters on Indigenous Peoples.

**Table 1. Example extracted from Annex 1,
Scenario for Simulation Using Parallel Perspectives¹**

SCENARIO FROM A TRADITIONAL PERSPECTIVE	SCENARIO FROM AN INDIGENOUS PERSPECTIVE
<p>90 DAYS BEFORE THE EVENT</p> <p>The Tungurahua volcano rises in the Eastern range of the Ecuadorian Andes, along the border between the provinces of Chimborazo and Tungurahua. After 20 years of inactivity, the Tungurahua volcano has begun to show visible signs of activity. Yesterday at 4:30 pm, a column of steam rose to a height of several kilometers, accompanied by a significant increase in seismic activity. A yellow alert has been declared for volcano's the area of influence.</p>	<p>90 DAYS BEFORE THE EVENT</p> <p>From a gender perspective, in the eyes of the indigenous peoples in the region, the volcano is a woman—Mama Tunkurawa. As a woman, the volcano has rhythmic cycles of transition, guided by the moon, by taita inti (father sun), and by humans.</p> <p>After 19 solar cycles of tranquility, she awakens, her strong voice issuing a warning to her sons and daughters to prepare for the arrival of a new cycle, where fire will regenerate life, allowing us to resume the guiding principles of good living.</p>

Writing the Tasks and/or Discussion Questions

Once a scenario has been prepared using parallel perspectives of the event, the organizers will **write tasks or discussion questions** that will be presented to the participants as the simulated emergency situation unfolds. The specific objectives of the simulation exercise – in this case, to improve disaster risk management, post-emergency interventions, and health outcomes for indigenous peoples – will help guide the preparation of these questions/tasks. The tasks can be delivered in a number of ways – written, oral, video, or transmitted via other means – but given the time limits of these exercises, written transmissions are recommended.

¹ Consult Annex 1 for an example of a scenario with parallel perspectives.

Table 2. Example extracted from Annex 2, Distribution of Tasks²

SCENARIO AND DISTRIBUTION OF TASKS FROM A TRADITIONAL PERSPECTIVE GROUP 1	
<p style="text-align: center;">90 Days Before the Event</p> <p>After 20 years of inactivity, yesterday, at 16:32, a column of steam rose up to several kilometers in height, with a significant increase in the seismic activity of the Tungurahua volcano and the emission of a large amount of gases. The Minister of Health requests the Directorate of Emergencies and Disasters to take action and change the alert level in the surrounding area to yellow.</p> <p>During the volcano's last eruption in May 1999, a forced evacuation of the population was carried out in urban and rural areas; Despite the fact that a large explosion was expected, there was only sporadic ashfall during the following months, affecting four provinces (Tungurahua, Chimborazo, Bolívar and Pastaza). There is no additional information on the health impact to the population, but there was an increase in respiratory and skin diseases.</p>	
	<ul style="list-style-type: none"> • Task 1: After the eruption of the Tungurahua volcano in 1999, what measures or health actions were taken to guarantee the well-being of the indigenous population? Who took these measures, why, and what were the health outcomes?
	<ul style="list-style-type: none"> • Task 2: To ensure the well-being and health of the indigenous population in the area, what aspects should be considered and included in the health response planning for an imminent eruption?

² Consult Annex 2 for an example of a completed Chronology and Distribution of Tasks.

SCENARIO AND DISTRIBUTION OF TASKS FROM AN INDIGENOUS PERSPECTIVE GROUP 2

90 Days Before the Event

After 19 solar cycles of tranquility, Mama Tunkurawa awakens, her strong voice warning her sons and daughters to prepare for the arrival of the new cycle, where fire will regenerate life, allowing us to resume the guiding principles of good living. The last time her voice was heard, the Tunkurawa was at the beginning of the male fire cycle (1999). Fearing that Mama Tunkurawa's anger would reach those who lived along her slopes, a forced evacuation was set in motion. However, that did not happen, since the healing energy of the fire Taita had not reached its climax.

In line with the political and organizational structure in most indigenous communities, the highest authority is the Community Assembly, which delegates actions to the Governing Council (Governor), Council of Elders, Councils of Men and Women of wisdom, and other councils, in coordination with the western authorities such as parochial autonomous municipal governments, etc.

- **Task 1:** After the eruption of the Tungurahua volcano in 1999, what measures or health actions were taken to guarantee the well-being of the indigenous population? Who took these and measures, why, and what were the health outcomes?
- **Task 2:** To ensure the well-being and health of the indigenous population in the area, what aspects should be considered and included in the health response planning for an imminent eruption?

Discussing Tasks/Questions and Proposing Solutions

- The participants will be divided into two or more groups (if their number allows for it). Ideally, each group should be limited in number so that robust discussion can take place and solutions proposed.
- Each group will have representatives from the indigenous community and health professionals and/or organizations working with Indigenous Peoples.
- Each set of tasks corresponding to a designated timeframe in the scenario (see Table 2) will also be presented with an accompanying scenario either from a traditional perspective or an indigenous perspective.
- The tasks will remain the same for both groups. Their challenge is to propose solutions and recommendations based on the information they receive and the perspective in which this information is viewed. The document in Annex 2, Simulated Chronology and Tasks, outlines the full distribution of this information.

Using an Operational Framework to Document Group Findings

As they discuss proposed solutions to the tasks they have been given, the group(s) will document these recommendations, one-by-one, according to the perspective they are considering. The groups will use the Operational Framework found in Annex 3 to present their findings by stage of the disaster (see Guidance Note, Section V—Key Considerations for Engaging with Indigenous Peoples in the Planning and Implementation of Health Disaster Risk Reduction for more information about these stages).

The outcome of this exercise will reveal **what needs to be done** in each stage; **when** interventions should be undertaken (before, during or after an emergency/disaster); and **who is responsible** for the coordination and implementation of activities.

References

- Pan American Health Organization (2019). Guidance Note on Health Disaster Risk Management with Indigenous Peoples.
- World Health Organization (2017) WHO Simulation Exercise Manual. [Internet]. Available at: <https://bit.ly/2WVZ69y>

Annexes

- Annex 1.** Scenario Using Parallel Perspectives for Simulation Exercise with Indigenous Peoples
- Annex 2.** Chronology of Events and Distribution of Inputs and Tasks for Discussion
- Annex 3.** Operational Framework for Integrating Indigenous Knowledge into Health Disaster Risk Management (collecting results of discussions)
- Annex 4.** Health Issues Related to the Mass Migration of Indigenous Peoples
A Case Study and Discussion Questions Regarding Public Health in Shelters

ANNEXES

Annex 1

Scenario Using Parallel Perspectives for Simulation Exercise with Indigenous Peoples

Note to the Organizers:

Annex 1 presents an overview of a **one** single emergency scenario that is viewed through the lens of **two** different perspectives, from a health and/or local or national disaster managers and from an indigenous cosmovision.

The organizers must read and understand the dual perspective scenario presented in this Annex. This information **is not for distribution** to the participants at this time. The information in this scenario is based on a real situation of a volcanic emergency. The organizers can adapt or modify names, circumstances, or other details for a more realistic local scenario. The information related to the indigenous cosmovision can also be adapted with the support of Indigenous leaders and experts.



Scenario Using Parallel Perspectives for Simulation Exercise with Indigenous Peoples

SCENARIO FROM A TRADITIONAL PERSPECTIVE	SCENARIO FROM AN INDIGENOUS PERSPECTIVE
<p>90 DAYS BEFORE THE EVENT</p> <p>After 20 years of inactivity, the Tungurahua volcano is beginning to show visible signs of reactivation. Yesterday at 4:30pm, a column of steam rose to a height of several kilometers. This was accompanied by a substantial increase in seismic activity and the significant emission of gases. A yellow alert has been declared for the area of influence around the volcano.</p> <p>The Tungurahua volcano rises in the eastern range of the Andes mountains in Ecuador, on the border between the provinces of Chimborazo and Tungurahua. Its last eruption was in May 1999, when a forced evacuation was carried out in both urban and rural areas. Although a large explosion was expected, during the following months there was only sporadic ash fall, affecting four provinces (Tungurahua, Chimborazo, Bolívar, and Pastaza). No further information is available on the health of the population at that time, but there was an increase in respiratory infections and skin rashes.</p>	<p>90 DAYS BEFORE THE EVENT</p> <p>From a gender perspective, in the eyes of the indigenous peoples in the area, the volcano is a woman—Mama Tunkurawa. As a woman, the volcano has rhythmic cycles of transition, and is guided by the moon, Taita Inti (Father Sun), and by humans.</p> <p>Mama Tunkurawa is the matriarch of the Apus family (hills, volcanoes) located between the provinces of Chimborazo and Tungurahua. The Kichwas peoples Salasaca, Tomabela, Quizapincha, Chibuleo, Puruwa and more than 200 indigenous communities have been raised under the tutelage of Mama Tunkurawa and Taita Chimborazo.</p> <p>After 20 solar cycles of tranquility, she awakens, using her strong voice to warn her sons and daughters to prepare for the arrival of a new cycle, where fire will regenerate life, allowing us to resume the guiding principles of good living.</p>

SCENARIO FROM A TRADITIONAL PERSPECTIVE	SCENARIO FROM AN INDIGENOUS PERSPECTIVE
<p>ONE DAY BEFORE THE EVENT</p> <p>Ecuador's Geophysical Institute reports a significant increase in volcanic activity. Explosions are heard and the experts have witnessed incandescent material in the volcano's crater. The alert level remains at yellow.</p> <p>The Ministers of appropriate agencies are being notified that the possibility of an eruption is very high. It is recommended that they activate their existing contingency plans.</p>	<p>ONE DAY BEFORE THE EVENT</p> <p>Thanks to Mama Tunkurawa's strong character, and for those of us who understand her language and are aware that our being is just one element of nature, her warnings have prompted us to leave the surrounding area. It is time to reflect and comply with the guiding principles of <i>sumak kawsay</i>—good living.</p>

<p>DAY 2 AFTER THE EVENT</p> <p>08h34</p> <p>Ash fall has been reported in the city of Ambato and in other locations in the northern part of the province of Tungurahua.</p> <p>10h30</p> <p>Press Release: Due to the activity surrounding the Tungurahua volcano, the Department of Risk Management has raised the alert level from yellow to orange. The population is advised to use extreme caution when driving on the roads and highways near streams, as the descent of the pyroclastic flows is following their course.</p> <p>Recommendations have gone out to the population closest to the volcano to wear masks and goggles to prevent health problems related to ash fall.</p>	<p>DAY 2 AFTER THE EVENT</p> <p>08h34</p> <p>The ash purifies all evil spirits from Mother Earth. It is then transformed into food. Mama Tunkurawa allows the earth to regenerate itself and life will flourish in this territory. Only she can claim the right to restore a harmonious and respectful coexistence.</p> <p>10h30</p> <p>Those of us who have invaded and uprooted the volcano's slopes and gardens must now realize that cosmic justice must be served. We must reactivate our relationship with Mama Tunkurawa, repaying her for our transgressions.</p>
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SCENARIO FROM A TRADITIONAL PERSPECTIVE	SCENARIO FROM AN INDIGENOUS PERSPECTIVE
<p>DAY 4 AFTER THE EVENT</p> <p>8h00</p> <p>Three persons have died from burn-related injuries in the Bascún Ravine area and another four people have died near Palictahua. At least 12 people are being treated for varying degrees of burns. Two health units in the high-risk areas, as well as some 30 homes, were destroyed.</p> <p>In the several places in the provinces of Tungurahua, Bolívar, and Chimborazo, the ash has accumulated to a depth of more than 19 cm.</p> <p>National response organizations are providing care for people in at-risk areas and are working to prevent disease outbreaks. Hospital plans have been activated and service hours extended. Masks were delivered to the population near the volcano.</p> <p>At least 40 temporary shelters have been established, mainly in the provinces of Tungurahua and Chimborazo, and are housing approximately 6,000 people.</p>	<p>DAY 4 AFTER THE EVENT</p> <p>8h00</p> <p>We hear that three people have died. The cycle's days of change have ended. Those who did not heed Mama Tunkurawa's plea to leave the area have suffered the consequences. Her majestic force has realigned nature and everything in its territory (houses, crops, animals).</p> <p>As a manifestation of her strength, a great quantity of ash was given to Pachamama (Mother Earth). This has affected people's health and the institutions responsible for ensuring the welfare of the community begin to provide care in the places where they temporarily housed.</p>

SCENARIO FROM A TRADITIONAL PERSPECTIVE	SCENARIO FROM AN INDIGENOUS PERSPECTIVE
<p data-bbox="386 380 690 407">DAY 4 AFTER THE EVENT</p> <p data-bbox="282 443 362 470">16h00</p> <p data-bbox="282 501 792 747">Medical brigades are providing assistance in shelters. The community is kept informed, primarily through the media, about the risks related to ash fall and about measures to protect themselves. Additionally, epidemiological surveillance systems were activated to monitor communicable diseases.</p> <p data-bbox="282 779 792 995">The Ministry of Agriculture and Livestock reports that the ash has affected agricultural lands. All short-cycle crops, including tree tomatos, mandarin oranges, and other fruits, have been lost. Proposals to send livestock to other cities for their protection are being considered.</p> <p data-bbox="282 1026 792 1115">The authorities recommend that people do not return to their homes, even when the warning level drops to yellow.</p>	<p data-bbox="1008 380 1312 407">DAY 4 AFTER THE EVENT</p> <p data-bbox="906 443 1416 726">Although it is true that Mama Tunkurawa has completed her transition cycle, it is still important to stay away from its territory. We must put into practice our knowledge and wisdom regarding nature, since the changes to Mother Earth's spirit and that of the environment can affect our spirit and caused diseases like mancharisha, allpa hapishka, nina hapishka.</p> <p data-bbox="906 758 1416 905">The indigenous peoples who were well acquainted with Mama Tunkurawa's character and strength stayed away and consequently did not have to go to shelters.</p>

SCENARIO FROM A TRADITIONAL PERSPECTIVE	SCENARIO FROM AN INDIGENOUS PERSPECTIVE
<p>DAY 5 AFTER THE EVENT</p> <p>There been an increase in injuries caused by falls from the roofs of houses. People are being treated.</p> <p>Mobile health units have been moved to areas where health facilities were destroyed.</p> <p>The poultry sector has been severely affected due to the loss of 90% of the farms in the area. It is evident that at least 90% of agricultural production in the area is affected and there is a shortage of food for livestock and animals in general.</p> <p>Contamination of water sources has led to restrictions on water consumption.</p> <p>People begin to return to their homes, despite warnings from the authorities.</p>	<p>DAY 5 AFTER THE EVENT</p> <p>Community leaders are concerned. They tell us: "They are distributing masks; they make us put them on the animals. They get dirty quickly and they don't let us breathe. They do not let me breathe; it is better to use long cloths or even scarves that can protect us from neck pain."</p> <p>The leader of the community calls for a minga to help with site clean up. Drinking water is delivered to in the communal house and women from the minga organize its distribution according to the number of family members in each neighborhood or community.</p>

<p>DAY 7 AFTER THE EVENT</p> <p>At this juncture, 18 shelters are in full operation with approximately 1,500 people. Mental health interventions, medical care, and epidemiological surveillance activities are being carried out here.</p> <p>Ash fall continues on a permanent basis. The alert level has been downgraded to yellow. Several NGOs coordinate with local and national authorities to deliver humanitarian assistance—food packages, hygiene kits, cleaning materials and other supplies—to communities in the most affected areas.</p>	<p>DAY 7 AFTER THE EVENT</p> <p>The medical care we are receiving is 'Western' medicine. They are sending many pills, but the guaguas (children) continue with diarrhea and fever; the little ones do not want to breastfeed. The indigenous population does not want go to health centers or mobile units because have not been getting better. They prefer to go to taita yachak, who says, in words they understand, that the child has a rash and treats the condition.</p>
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SCENARIO FROM A TRADITIONAL PERSPECTIVE	SCENARIO FROM AN INDIGENOUS PERSPECTIVE
<p>DAY 30 AFTER THE EVENT</p> <p>One month later, there are still eight temporary shelters that are housing 750 people. Health care is provided twice a week in the shelters.</p> <p>Sporadic ash fall continues. The alert level remains at yellow.</p>	<p>DAY 30 AFTER THE EVENT</p> <p>Private-public institutions organize a minga to support the people who have been affected and their animals. Over these last weeks, our lives have been transformed. We are now more supportive of each other, practicing the collective spirit of bonding between human beings. Mama Tunkurawa acknowledges this, and she begins to rest.</p>

<p>SIX MONTHS AFTER THE EVENT</p> <p>Six months after the eruption of the Tungurahua volcano, there are still three shelters in the area, with 150 people, most of whom have homes that were damaged or destroyed.</p> <p>The alert level remains at yellow.</p> <p>There has been an increase in cases of respiratory, ocular and skin diseases in recent months.</p>	<p>SIX MONTHS AFTER THE EVENT</p> <p>Mama Tunkurawa is a living being, and she has completed her transition phase. Throughout this period she has represented a bridge for spiritual dialogue between the living and our ancestors. She has given us the opportunity to seek balance through reciprocity: everything we do to the mother, to the family, and to one another must be answered for.</p>
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Annex 2

Distribution of Inputs and Tasks

Note to the Organizers:

At this stage of the exercise, the organizers will divide the participants into two or more groups (depending on the number of participants). The composition of each group should be as balanced as possible between health and/or local or national disaster managers and indigenous representatives. The size of the groups should be appropriate to allow for robust discussion and the proposal of solutions.

Once participants are divided in groups, the organizers will begin to distribute the information in Annex 2. Given that the length of time scheduled for the exercise may vary, organizers can use their discretion as to how much time is allotted to each block. This information is organized to present a chronological recap of the events. At the end of each block you will find one or more tasks to be discussed by the Groups. A group member(s) will keep careful notes on the proposed solutions.

Each individual block has two handouts: Group 1 will receive information from a traditional perspective, with accompanying tasks. Group 2 will receive information from an indigenous perspective. Both groups will have the same tasks.

The balance in the makeup of the groups will allow certain individuals to consider points of view from a perspective that they are, by and large, unfamiliar with, thus helping to stimulate dialogue and propose novel solutions.



Chronology of the Event Using Parallel Perspectives Distribution of Inputs and Tasks

DISTRIBUTION TO GROUP 1

90 Days Before the Event

After 20 years of inactivity, the Tungurahua volcano began to show visible signs of activity. Yesterday, at 16:32, a column of steam rose from the volcano to a height of several kilometers, with a significant increase in the seismic activity of the Tungurahua volcano and the emission of a large amount of gases. A yellow alert has been declared for the surrounding area.

The Tungurahua volcano rises in the Eastern Cordillera of Ecuador, on the border of the provinces of Chimborazo and Tungurahua. Its last eruption was in May 1999, when a forced evacuation of the population was carried out both in urban and rural areas. Despite the fact that a large explosion was expected, there was only sporadic ash fall during the following months, affecting four provinces (Tungurahua, Chimborazo, Bolívar and Pastaza). There is no further information on the health of the population at that time, but there was an increase in respiratory and skin diseases.

Baños de Agua Santa, in the province of Tungurahua, has 14,600 inhabitants. It is one of the most important tourist sites in Ecuador, as it is the starting point for the routes that cross the Tungurahua volcano, located 5 km from the city.

- **Task 1:** The Minister of Health requests the Directorate of Emergencies and Disasters to take action in light of the change in alert level to yellow. What actions should be taken and by whom? What further information is required?
 - › Province of Tungurahua:
 - › Area: 1,307 mi²
 - › Capital: Ambato (50% of the population)
 - › Population: 581,389 (2011)

- **Task 2:** To ensure the well-being and health of the indigenous population in the area, what aspects should be considered and included in the contingency plan for the eruption of the Tungurahua volcano?

DISTRIBUTION TO GROUP 2

90 Days Before the Event

From a gender perspective, in the eyes of the indigenous peoples in the area, the volcano is a woman -- Mama Tunkurawa. As a woman, the volcano has rhythmic cycles of transition, guided by the moon, taita inti (father sun), and humans. In the provinces of Tungurahua and Chimborazo, Mama Tunkurawa is the matriarch of the Apus family (the hills and volcanoes). Many Indigenous Peoples and more than 200 indigenous communities have been raised under the tutelage of Mama Tunkurawa. After 20 tranquil solar cycles she awakens, warning her sons and daughters to prepare for the arrival of the new cycle, where fire will regenerate life, allowing us to resume the guiding principles of good living.

In line with the political and organizational structure in most indigenous communities, the highest authority is the Community Assembly, which delegates actions to the Governing Council (Governor), Council of Elders, Councils of Men and Women of Wisdom, and other councils, in coordination with the western authorities such as parochial autonomous municipal governments

- › Primary ethnic groups in Tungurahua province : The Quisapinchas, Pilahuines, Chibuleos, Salasacas, Píllaros and Pasas.
- › Indigenous population: 12.4%
- › Economy: The rural economy centers around agriculture and livestock.

The last time her strong voice was heard (May 1999), the Tunkurawa was at the beginning of the male fire cycle. Fearing that Mama Tunkurawa's anger would reach those who lived along her slopes, a forced evacuation was set in motion. However, the threat did not materialize.

- **Task 1:** The Minister of Health requests the Directorate of Emergencies and Disasters to take action in light of the change in alert level to yellow. What actions should be taken and by whom? What further information is required?

- › Province of Tungurahua:
- › Area: 1,307 mi²
- › Capital: Ambato (50% of the Population)
- › Population: 581,389 (2011)

- **Task 2:** To ensure the well-being and health of the indigenous population in the area, what aspects should be considered and included in the contingency plan for the eruption of the Tungurahua volcano?

DISTRIBUTION TO GROUP 1

One Day Before the Event

19h20

Ecuador's Geophysical Institute reports a significant increase in the activity of the Tungurahua Volcano. Explosions are heard and scientists have observed the presence of incandescent material in the volcano's crater. The alert level is maintained at yellow.

The Ministers of appropriate agencies are being notified that the possibility of an eruption is very high. It is recommended that they activate their existing contingency plans.

- **Task 3:** In 20 minutes, the Vice Minister of Health wants a summary of the information you have learned so far. This can include your assessment of what health issues might be faced at present, as well as health measures or actions that were taken or should have been taken to safeguard the at-risk population, including the indigenous population, during the 1999 eruption of the Tungurahua volcano.

DISTRIBUTION TO GROUP 2

One Day Before the Event

19h20

Mama Tunkurawa's strong character is in evidence as she emits forth warning signs of what is to come, giving us time to flee the area. For those of us who understand her language and are conscious of our being just one part of nature, it is a moment of reflection on the guiding principles of sumac kawsay: 'good living,' in harmony with our community, ourselves, and most importantly, with our environment.

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DISTRIBUTION TO GROUP 1

Day Two After the Event

08h34

Ash fall has been reported in the city of Ambato and in other locations in the north of the province of Tungurahua.

10h30

Press Release: Due to continued volcanic activity, the Secretariat of Risk Management has raised the alert level from yellow to orange for the area surrounding the volcano. The population is advised to use extreme caution when driving on the roads and highways near streams, as the descent of the pyroclastic flows is following their course.

Recommendations have gone out to the population closest to the volcano to wear masks and goggles to prevent health problems related to ash fall.

- **Task 4:** Radio Matiavi is heard throughout the Andean region, primarily by rural populations in the provinces of Tungurahua, Bolivar and Cotopaxi. The radio station will be issuing a situational update in 10 minutes. They would like to know what recommendations should be given to the indigenous population to deal with the eruption of the Tungurahua volcano?

- **Task 5:** The Ministry of Health has 1,000 protective goggles in stock and 5,000 adult surgical masks. The health minister decides to buy an additional 100,000 masks and 30,000 protective goggles for its stockpile.
 - › How would you distribute the existing stock?
 - › What recommendations would you give regarding the purchase of additional masks and goggles? What other recommendation would you give?
 - › What recommendations and through what means would you inform the population?

DISTRIBUTION TO GROUP 2

Day Two After the Event

08h34

The ash purifies all evil spirits from Mother Earth. It is then transformed into food. Mama Tunkurawa allows the earth to regenerate itself and life will flourish in this territory. Only she can claim the right to restore a harmonious and respectful coexistence.

10h30

Those of us who have invaded and uprooted the volcano's slopes and gardens must now realize that cosmic justice must be served. We must reactivate our relationship with Mama Tunkurawa, repaying her for our transgressions.

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 - › What recommendations and through what means would you inform the population?

DISTRIBUTION TO GROUP 1

Day Three After the Event

08h00

Yesterday at 6:00pm, volcanic activity intensified. Ash fall of up to 1cm is reported in the provinces of Bolívar, Chimborazo and Pastaza, and up to 2 cm in other localities. Ecuador's Geophysical Institute reports that an explosion is imminent in the next 24 hours. It changes the alert level from orange to red in the area surrounding the volcano.

17h15

Loud bellows are heard coming from the volcano and mudslides flow down the gorges of Juivi Chico, Baños and Ulba, causing the evacuation some 2,000 people to makeshift shelters in relatively safe areas of the city of Pelileo. Pyroclastic flows are also affecting the tourist industry and the El Agoyán dam that generates electricity for a large population in the region.

20h00

There are reports that 4,000 people have been evacuated to Huambaló, Pelileo, Patate, and Puyo (Pastaza).

Ash fall continues in the provinces of Tungurahua, Bolívar and Chimborazo. Authorities report that a large percentage of the population refuses to evacuate their homes.

- **Task 6.** Identify and discuss key health actions that the health sector should promote or educate about: for example, early stages of pregnancy; mental health; communicable diseases; safe drinking water; vector-borne diseases. What role can indigenous leaders play?

DISTRIBUTION TO GROUP 2

Day Three After the Event

8h00

Mama Tunkurawa's transition is flourishing. Each time the end of her cycle approaches, nature's guardian spirits manifest themselves. Those who understand her language know that the climax will be reached in the next few hours

20h00

Mama Tunkurawa has spoken. For those who follow the path of the spirits, it is time to move away to safe places. Her transforming energy will impact those who do not heed her call

- **Task 6.** Identify and discuss key health actions that the health sector should promote or educate about: for example, early stages of pregnancy; mental health; communicable diseases; safe drinking water; vector-borne diseases. What role can indigenous leaders play?

DISTRIBUTION TO GROUP 1

Day Four After the Event

08h00

Three persons have died from burn-related injuries in the Bascún Ravine area and another four people have died near Palictahua. At least 12 people are being treated for varying degrees of burns. Two health units in the high-risk areas, as well as some 30 homes, were destroyed.

National response organizations are providing care for people in at-risk areas and are working to prevent disease outbreaks. Hospital plans have been activated and service been extended. Masks were delivered to the population near the volcano.

At least 40 temporary shelters have been established, mainly in the provinces of Tungurahua and Chimborazo, and are housing approximately 6,000 people.

16h00

Medical brigades are providing assistance in shelters. The community is kept informed, primarily through the media, about the risks related to ash fall and about measures to protect themselves. Additionally, epidemiological surveillance systems were activated to monitor communicable diseases.

The Ministry of Agriculture and Livestock reports that the ash has affected agricultural lands. All short-cycle crops, including tree tomatos, mandarin oranges, and other fruits, have been lost. Proposals to send livestock to other cities for their protection are being considered.

The authorities recommend that people do not return to their homes, even when the warning level drops to yellow.

- **Task 7:** What are some of the diseases or illnesses that require surveillance and should be reported by the local health services, including by NGOs, to the host country? With what frequency should the reporting take place? Consider the intercultural considerations required to gather this information.

DISTRIBUTION TO GROUP 2

Day Four After the Event

8h00

Three deaths have been reported in Bascún Creek. For Indigenous Peoples, death is part of the cycle of life; a transition to Chachahuk Pacha, to the world of our ancestors—our spiritual guides—so that those of us who are still living will have a permanent bond with them.

The cycle's days of change have ended. Those who did not heed Mama Tunkurawa's plea to leave the area have suffered the consequences. Her majestic force has realigned nature and everything in its territory (houses, crops, animals).

As a manifestation of her strength, a great quantity of ash was given to Pachamama (Mother Earth). This has affected people's health. Institutions responsible for ensuring the community's welfare begin to provide care in the places where they temporarily housed.

16h05

Although it is true that Mama Tunkurawa has completed her transition cycle, it is still important to stay away from its territory. Those indigenous peoples who knew respected Mama Tunkurawa's character and force stayed away and therefore did not have to go to shelters.

- **Task 7:** What are some of the diseases or illnesses that require surveillance and should be reported by the local health services, including by NGOs, to the host country? With what frequency should the reporting take place? Consider the intercultural considerations required to gather this information.

DISTRIBUTION TO GROUP 1

Day Five After the Event

There been an increase in injuries caused by falls from the roofs of houses. People are being treated. Mobile health units have been moved to areas where health facilities were destroyed.

The poultry sector has been severely affected due to the loss of 90% of the farms in the area. It is evident that at least 90% of agricultural production in the area is affected and there is a shortage of food for livestock and animals in general.

Due to the contamination of water sources, water consumption is restricted. People start to return to their homes despite the warning from the authorities.

- **Task 8:** A neighboring country offers two truckloads of medical supplies, health personnel and a small mobile medical unit. Should you accept or reject this offer? On what do you base your decision? What factors should be taken into consideration, including cultural considerations?

DISTRIBUTION TO GROUP 2

Day Five After the Event

Community leaders are concerned. They tell us: "They are distributing masks; they make us put them on the animals. They get dirty quickly and they don't let us breathe. They do not let me breathe; it is better to use long cloths or even scarves that can protect us from neck pain."

The leader of the community calls for a minga to help with site clean up. Drinking water is delivered to in the communal house and women from the minga organize its distribution according to the number of family members in each neighborhood or community.

- **Task 8:** A neighboring country offers two truckloads of medical supplies, health personnel and a small mobile medical unit. Should you accept or reject this offer? On what do you base your decision? What factors should be taken into consideration, including cultural considerations?

DISTRIBUTION TO GROUP 1

Day Seven After the Event

At this juncture, 18 shelters are in full operation with approximately 1,500 people. Mental health interventions, medical care, and epidemiological surveillance activities are being carried out here.

Ash fall continues on a permanent basis. The alert level has been downgraded to yellow.

Several NGOs coordinate with local and national authorities to deliver humanitarian assistance—food packages, hygiene kits, cleaning materials and other supplies—to communities in the most affected areas.

- **Task 9:** Is there a need for additional health/medical staff in the shelter? What type of skills do they need? How will local staff and community authorities deal with influx of volunteers – what problems do you anticipate in managing these people?

DISTRIBUTION TO GROUP 2

Day Seven After the Event

The medical care we are receiving is 'Western' medicine. They are sending many pills, but the guaguas (children) continue with diarrhea and fever; the little ones do not want to breastfeed. The indigenous population does not want go to health centers or mobile units because they are not getting better. They prefer to go to taita yachak, who says, in words they understand, that the child has a rash and treats the condition.

- **Task 9:** Is there a need for additional health/medical staff in the shelter? What type of skills do they need? How will local staff and community authorities deal with influx of volunteers – what problems do you anticipate in managing these people?

DISTRIBUTION TO GROUP 1

30 Days After the Event

One month later, there are still eight temporary shelters that are housing approximately 750 people. Health care is provided twice a week in the shelters.

Sporadic ash fall continues. The alert level remains at yellow.

- **Task 10:** Deteriorating environmental conditions can lead to a host of health issues. From all points of view, what are the most common concerns? How can these concerns be dealt with? How will the shelter population respond to this concerns and proposed solutions?

DISTRIBUTION TO GROUP 2

30 Days After the Event

Private/public institutions organize a minga, where neighbors and friends join together in a show of solidarity to support people who have been affected and their animals. Over the last 30 days, our lives have been transformed. We are now more supportive of each other, practicing the collective spirit of bonding between human beings. Mama Tunkurawa acknowledges this, and she begins to rest.

- **Task 10:** Deteriorating environmental conditions can lead to a host of health issues. From all points of view, what are the most common concerns? How can these concerns be dealt with? How will the shelter population respond to this concerns and proposed solutions?

DISTRIBUTION TO GROUP 1

Six Months After the Event

Six months after the eruption of the Tungurahua volcano, there are still three shelters in the area, with 150 people, most of whom have homes that were damaged or destroyed.

The alert level remains at yellow.

There has been an increase in cases of respiratory, ocular and skin diseases in recent months.

- **Task 11:** What are the long-term consequences of temporary settlements? What impact do they have on the population being housed there?

DISTRIBUTION TO GROUP 2

Six Months After the Event

Mama Tunkurawa is a living being. She has now completed her transition phase. Throughout this period, she has represented a bridge for spiritual dialogue between the living and our ancestors. She has given us the opportunity to seek balance through reciprocity: everything we do to the mother, to the family, and to one another must be answered for.

- **Task 11:** What are the long-term consequences of temporary settlements? What impact do they have on the population being housed there?

Annex 3

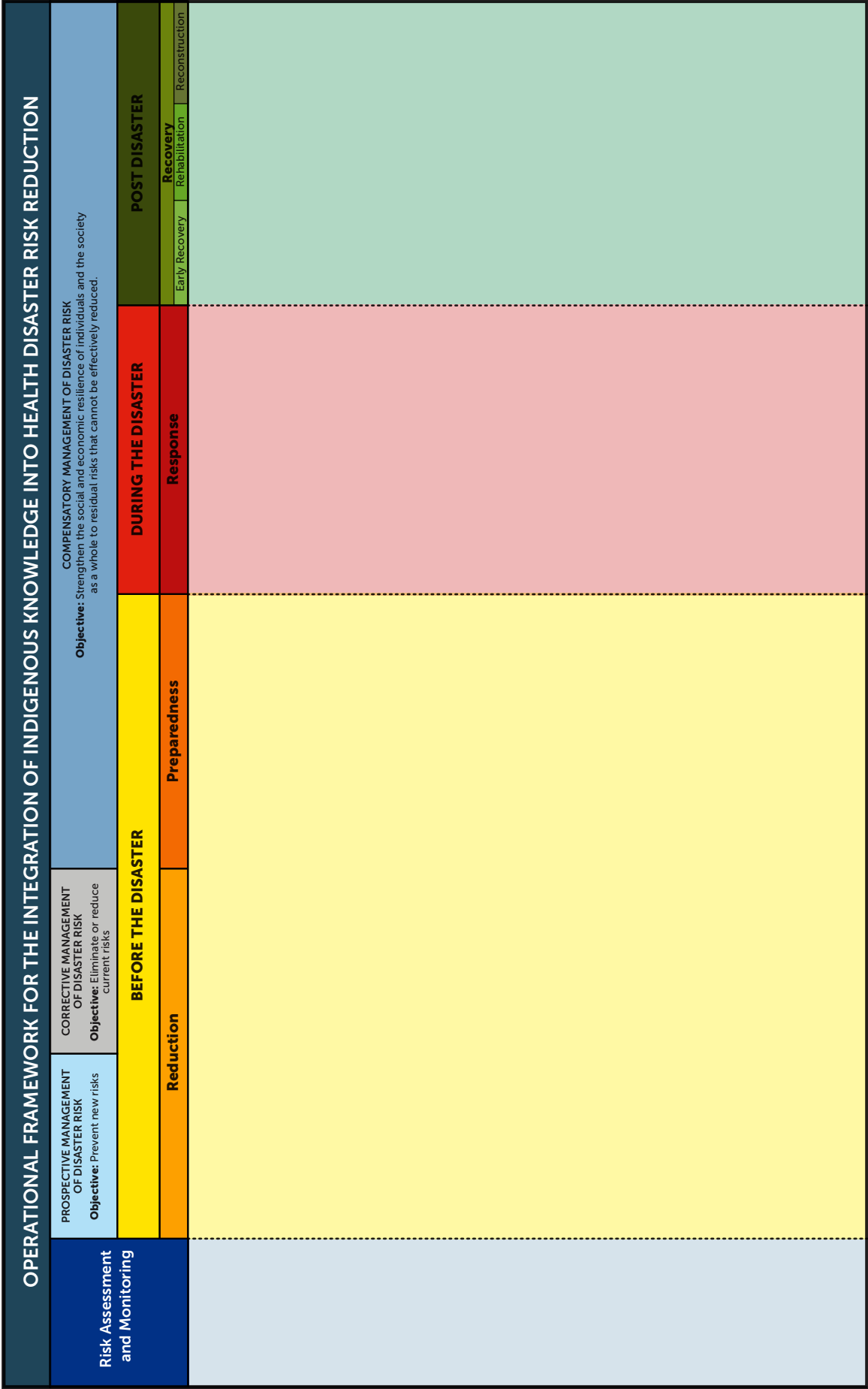
Operational Framework for Integrating Indigenous Knowledge into Health Disaster Risk Management

Note to the Organizers:

One or more copies of the Operational Framework will be distributed to each Work Group so that they can record their results and recommendations in the appropriate section.

Organizers should encourage group members to be as specific as possible in their recommendations, detailing who will be responsible for each action and how to best achieve the results.





Annex 4

Health Issues Related to the Mass Migration of Indigenous Peoples

A Case Study and Discussion Questions on a Public Health Emergency in Shelters

Note to the Organizers:

The following case study looks at the potential public health impact when a large number of indigenous people are housed in temporary settlements in a neighboring country.

In certain instances organizers may wish to use this exercise. This 90-minute (approximately) exercise will involve participants from indigenous communities and health and local community professionals that work with these populations. Work groups, representing a balance of members with differing perspectives, will review the scenario and provide solutions/recommendations to the discussion questions, from an intercultural perspective.



Health Issues Related to Mass Migration of Indigenous Peoples

A Case Study for Discussion

Due to the variety of factors leading to instability and unrest in their home country, a mass migration of thousands of people is underway. The border region of the neighboring country to which they are fleeing is predominantly rural.

The host country has received these migrants, providing them with temporary legal status and offering basic health care. They are living in shelters that are being run by military staff in the host country.

A large percentage of the migrant population is indigenous, with its own customs and languages. Certain shelters were designated specifically to receive indigenous peoples, but this plan has quickly become unrealistic. One shelter in PAJIKUN is currently housing an estimated 800 Indigenous Peoples (families, children, youth and seniors), although its capacity is only for 600. Among this indigenous population, there many high-risk individuals, including persons with disabilities, the elderly and young children who have not been vaccinated.

The military staff running the facility has begun to notice some critical health problems and is asking different national agencies and ministries to support the health response, while considering the need to adopt approaches that take into account the customs and worldviews of indigenous peoples. Severe cases of malnutrition and multiple parasitic diseases have been reported in children. There are many cases of advanced pregnancy among teenagers and there is no prenatal checks or attention. Among shelter residents there suspected cases of tuberculosis and people living with HIV. Moreover, there have been several recent suicide attempts. Some of the short-term risks to health may be managed during the emergency phase, but when communities are obliged to remain in emergency settlements for long periods of time, other psychosocial and health problems will require special attention.

The military staff reports that there is insufficient equipment and supplies to provide medical care to this growing population. The health human resources in this border area are in short supply (the health center has only four volunteer nurses and one doctor, and they work on part time basis, with a few additional volunteers from international organizations). There is only one small nursery for newborns and babies, with only the most basic of medicines available, and a general lack of other medications. The health center does not have a vehicle to transport people in case of emergency.

The environmental and sanitary conditions in the shelter are deficient. There are environmental problems caused by smoke from the kitchens and other cooking fires. Potable water is in short supply and there is a growing concern that the issues of refuse and solid waste disposal must be addressed.

In this general context, the population living in shelters has received scant information and education regarding the prevention of diseases and critical illnesses and shelter staff is unfamiliar with the customs of the migrant population. There has been a push to promote a vaccination campaign for specific diseases, including measles and other childhood illnesses.

Considering the lack of health staff, indigenous leaders have initiated some disease prevention measures and are helping to maintain behavioral controls in the facility.

Health Issues Related to Mass Migration of Indigenous Peoples

Discussion Questions

- Among the population housed in a shelter, what role can indigenous leaders play? Why?
- Is there a need for additional health/medical staff in the shelter? What type of skills do they need? How will local staff and community authorities deal with influx of volunteers – what problems do you anticipate in managing these people?
- What are some epidemiological conditions require surveillance and should reported by the local health services, including NGOs, to the host country? With what frequency should the reporting take place?
- Identify and discuss key health actions that the health sector should promote or educate about: for example, early stages of pregnancy; mental health; communicable diseases; safe drinking water; vector-borne diseases, etc.
- Discuss key elements to consider regarding cultural differences, to give an adequate response from the health sector.
- Deteriorating environmental conditions can lead to a host of health issues. From all points of view, what are the most common concerns? How can these concerns be dealt with? How will the shelter population respond to this concerns and proposed solutions?
- A week after news of the mass migration reached a global audience, through the press and on social media, the chief Medical Officer of a neighboring country offers to two truckloads of medical supplies, health personnel and a small mobile medical unit. Should you accept or reject this offer? What do you base your decision on? What factors should be taken into consideration, including cultural considerations from the standpoint of the receiving population in shelters, regarding donations in general? At national level, with whom do you discuss this decision? Where would you go for more information about these issues?
- What are the long-term consequences of temporary settlements to the population being housed there? To the host country?

Participants at the Consultation on the Integration of Indigenous Knowledge in Disaster Risk Reduction

Mexico City, Mexico
July 2018



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