



HUMAN
RIGHTS
WATCH

“You Don’t Want to Breathe Poison Anymore”

The Failing Response to Pesticide Drift in Brazil’s Rural Communities



“You Don’t Want to Breathe Poison Anymore”

The Failing Response to Pesticide Drift in Brazil’s
Rural Communities

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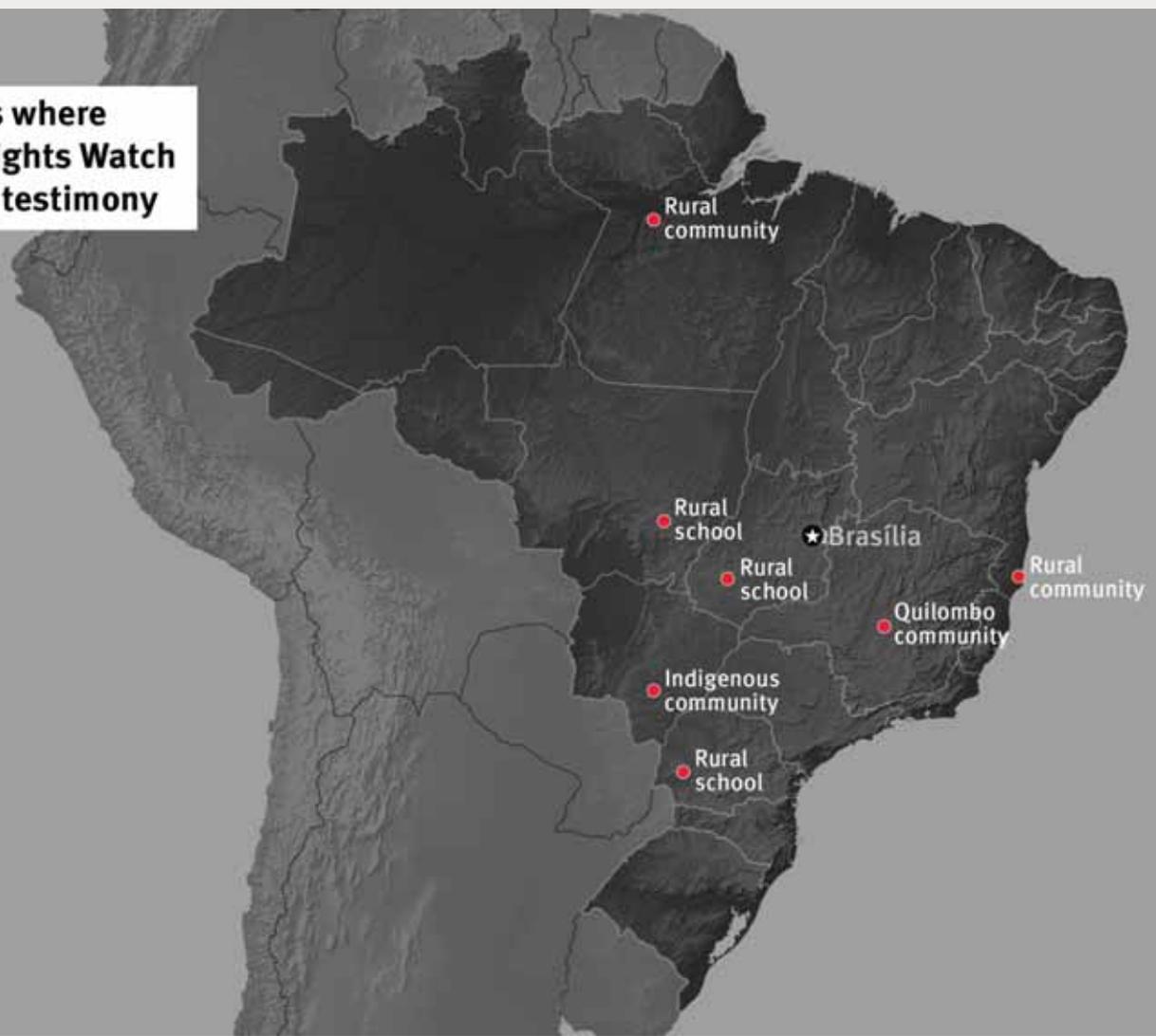
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**Locations where
Human Rights Watch
gathered testimony**



SUMMARY AND RECOMMENDATIONS





SUMMARY

In May 2013 an airplane sprayed pesticides over a rural school, São José do Pontal, located among the vast corn and soy plantations extending around Rio Verde, a city in Goiás state in Brazil. Around 90 people—mostly children studying at the school—were immediately hospitalized. The incident shocked the nation, and, in the immediate aftermath, Brazil was concerned about the issue of pesticide poisonings in rural areas.

Although this attention has long since dissipated, little has changed: rural people throughout the country continue to be poisoned by pesticides. Ordinary people going about their daily routines face toxic exposures from pesticide applications that frequently occur in immediate proximity to their homes, schools, and workplaces. They are exposed when pesticide spray drifts off target crops during application, or when pesticides vaporize and drift to adjacent areas in the days after spraying.

From July 2017 to April 2018, Human Rights Watch interviewed 71 people affected by pesticide drift in seven sites across rural Brazil, including farming communities, indigenous communities, *quilombos* (Afro-Brazilian communities), and rural schools. The sites are located throughout the five major geographic regions of Brazil.

In all seven sites, people described symptoms consistent with acute pesticide poisoning after seeing pesticide spraying nearby, or smelling pesticides recently applied to nearby fields. These symptoms commonly include sweating, elevated heart rate, and vomiting, as well as nausea, headache, and dizziness.

There is no reliable government data on how many people in Brazil suffer pesticide poisoning. The Ministry of Health acknowledges that under-reporting of pesticide poisoning is a concern and it seems clear that official data grossly understates the severity of this problem.

Bernardo, a man in his 30s, was born in a *quilombo* (Afro-Brazilian) community of around 60, men, women, and children in Minas Gerais State, southeast Brazil. Bernardo told Human Rights Watch that he feels powerless against aerial spraying of pesticides. “We’ve registered several complaints at the [local] civil police station and military police,” he said. “No one solves it—there is no justice.”





A rural school in Primavera do Leste municipality in the state of Mato Grosso in the mid-west region has just over 100 students, with classes for students around 15-16 years old during the day and for adults in the evening. There are plantations immediately beside the school grounds, with the closest classrooms about 15 meters from the fields. Human Rights Watch interviewed five students and teachers in the school.

Carina, a women in her mid-30s who studies at a school in the municipality of Primavera do Leste, Mato Grosso, stands near a cotton plantation. Carina suffered acute poisoning while attending school in 2017: “I started feeling sick, nauseous.... I started vomiting many times, until I had thrown up all I had in my stomach and was just retching. The classes were cancelled for everyone, and I went home.”

While this report documents cases of acute poisonings, chronic exposure to pesticides—repeated exposure to low doses over an extended period—is also a serious public health concern. Chronic pesticide exposure is associated with infertility, negative impacts on fetal development, cancer, and other serious health effects, and pregnant women, children, and other vulnerable people may face elevated risks.

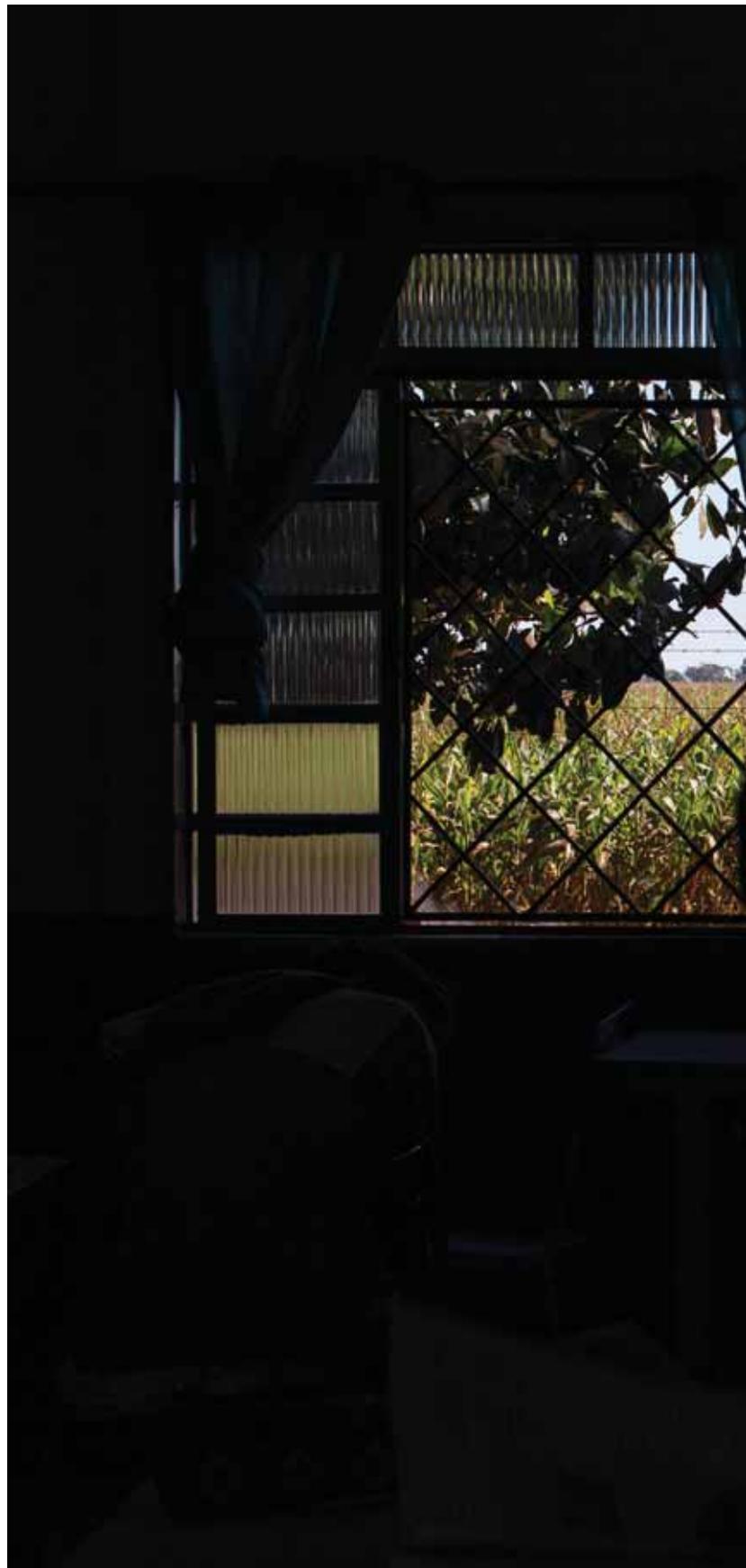
In many cases, there are no national, state, or municipal laws to protect people from pesticide drift. There is no national regulation establishing a buffer zone around sensitive sites in which ground spraying of pesticides is prohibited, and most states do not have such a law on their books. Human Rights Watch has found that even in the few states that do stipulate buffer zones for ground spraying, those rules are not routinely respected.

There is a national norm prohibiting aerial spraying of pesticides within 500 meters of villages, cities, communities, neighborhoods, and water sources. But, as with state-level buffer zones for ground spraying, this regulation is not consistently observed.

By and large, acute pesticide poisoning and chronic exposure is invisible to Brazil’s broader public and policy makers. One of the most insidious reasons for this invisibility is a fear of reprisals from large landowners that grips many rural communities. In 2010, a rural farmer and anti-pesticide activist was shot and killed after pushing the local government to ban aerial spraying that year. In the course of researching this report, threats or fear of retaliation were mentioned in five of the seven sites visited.

Brazil urgently needs to introduce measures to limit pesticide exposure that is harmful to human health. The Brazilian authorities should undertake a thorough and time-bound review of the health and environmental impacts of the current approach to pesticides. While undertaking this review, Brazil should impose a moratorium on aerial spraying and impose and enforce an immediate prohibition on ground spraying near sensitive sites.

A classroom at a school located in the municipality of Primavera do Leste, Mato Grosso, looking out on the plantations immediately beside the school grounds. The school has just over 100 students, with classes for 15- and 16-year-old children during the day and for adults in the evening. Some classrooms are about 15 meters from the fields.





A few hours' drive from Campo Grande, the capital city of Mato Grosso do Sul state in Brazil's mid-west region, a community of a few hundred indigenous Guarani-Kaiowá people live in huts and houses in a small forest around a stream. A plantation begins approximately 50 meters from the community's main hall and several houses located on the margins of the forest.

Human Rights Watch spoke to nine Guarani-Kaiowá men, women, and children living in this site. They described numerous incidents of acute poisoning by pesticides in recent years from both aerial and ground spraying.



Drone image of an indigenous Guarani-Kaiowá community located a few hours' drive from Campo Grande, the capital city of Mato Grosso do Sul in mid-west Brazil. The adjacent field alternates between growing soy and corn.







Aratiri, a 9-year-old boy, lives in an indigenous community in the state of Mato Grosso do Sul. Residents of the community told Human Rights Watch of numerous cases of acute poisoning by pesticides in recent years from both aerial and ground spraying.

Jakaira, a man in his 40s who has lived in his community in the state of Mato Grosso do Sul for 10 years, suffered acute poisoning around October 2017. He told Human Rights Watch: “You feel bitterness in the throat. You don’t want to breathe poison anymore—you want to breathe another type of air—but there isn’t any.”



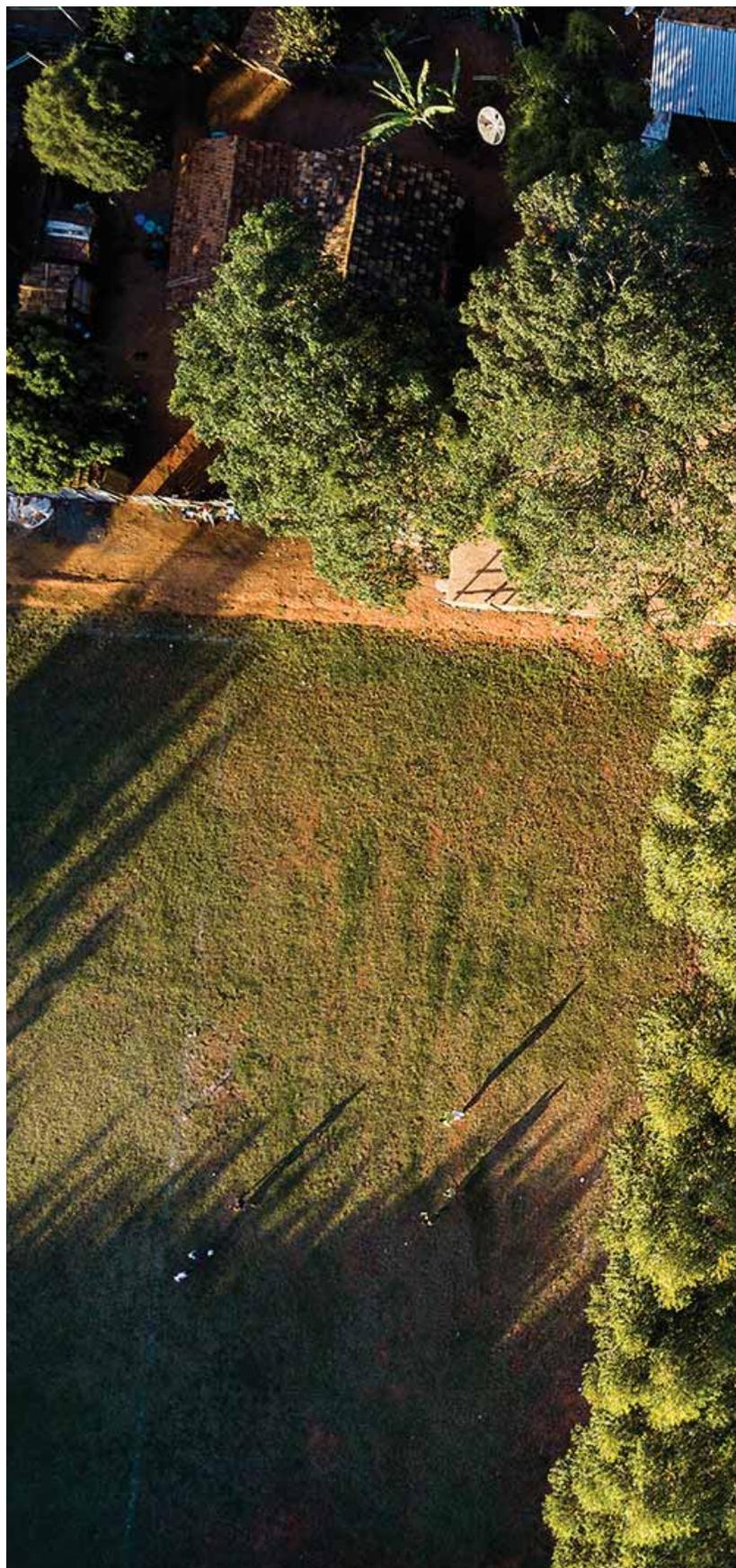


Panambi, a woman in her mid-20s, lives in a small house with her mother and four-year old daughter. She told Human Rights Watch that, during an episode of spraying on the nearby plantation in March 2018, she and her family felt their eyes burning and that she covered her daughter's mouth with a damp cloth to try and protect her. "We should be breathing fresh air, but we felt a bad taste, a burning [sensation.]"

A *quilombo* (Afro-Brazilian) community of around 60 men, women and children is located a few hours' drive from Belo Horizonte, the capital of the state of Minas Gerais in Brazil's southeast region. Houses are simple, set beside a few mango and banana trees, and residents grow beans, pumpkins, corn, and okra at small vegetable plots. Some of the houses in this site are around 20 meters away from the adjacent sugarcane plantation.

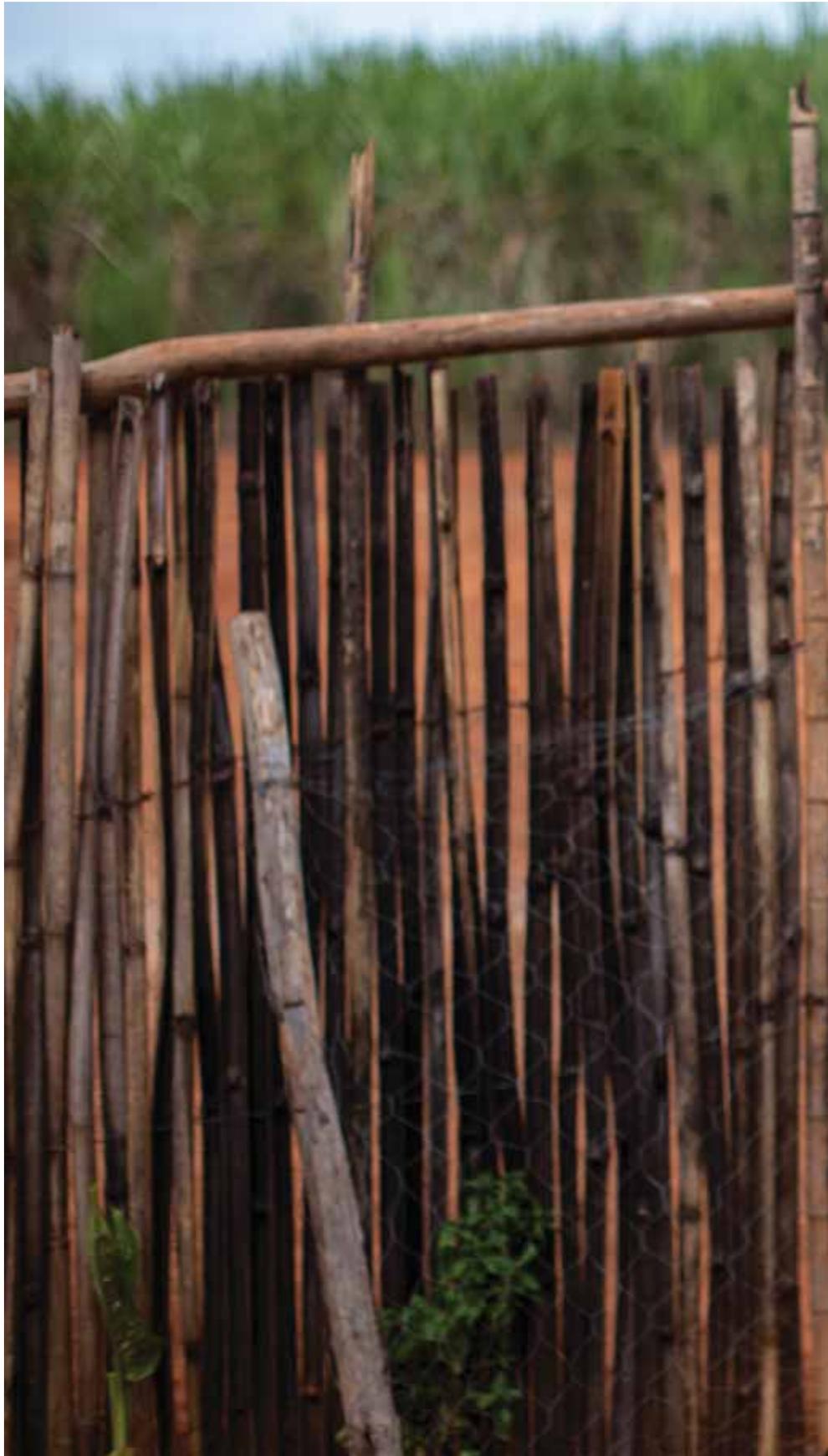
Human Rights Watch interviewed 21 men, women, and children. Residents said airplanes often spray over the houses of the community and that spraying interrupts daily activities—such as farming, cleaning of the garden, or just playing.

Drone view of a *quilombo* (Afro-Brazilian) community in Minas Gerais State, southeast Brazil. Some of the houses are around 20 meters from the adjacent sugarcane plantation.





Jovana, a woman in her mid-20s, with her young daughter. They live in Minas Gerais State and, along with other residents, said that airplanes often spray over the houses in their community. She described being sprayed by pesticides from airplanes, along with her children, and experiencing symptoms including headaches, nausea, dizziness and vomiting. Children are particularly vulnerable to the adverse effects of toxic exposures as their brains and bodies are still developing.







Pedrina, a woman in her mid-40s, lives in Minas Gerais State. She told Human Rights Watch she has felt the symptoms of acute poisoning from pesticide spray many times and described fearing retaliation if she went to the authorities to raise concerns about the health impacts of pesticide spraying.



Uiara, a woman in her early 50s, lives in Minas Gerais State. She told Human Rights Watch: “The airplane flies over the houses with the duster on. We don’t wait, we run inside the houses. The pesticides are very strong.”





Estevo, a man in his mid-50s, lives in Minas Gerais State. He told Human Rights Watch: “The airplane [spraying pesticides] flies over the community. Several times pesticides fell on me while I was working on the land. There is nothing we can do.”

RECOMMENDATIONS

TO THE MINISTRY OF AGRICULTURE

- Establish and enforce a nation-wide regulation for a buffer zone around sensitive sites, including human habitation and schools, for all forms of ground spraying;
- Establish a moratorium on aerial spraying of pesticides until the Ministry, in conjunction with the Ministries of Health and Environment and as part of a nation-wide review of current pesticide policies, undertakes a study on the human health impacts, environmental impacts, and associated economic costs of aerial spraying (including an analysis of the viability of alternative forms of application);
- In conjunction with the Ministries of Health and Environment, develop a comprehensive national action plan to reduce the use of highly hazardous pesticides in Brazil, via binding and measurable reduction targets with time limits, and accompanied by incentives to support alternatives to, and reductions of, highly hazardous pesticides.

TO THE MINISTRY OF HEALTH

- As part of a nation-wide review of current pesticide policies, conduct a review on the major health effects and associated costs of acute and chronic exposure to pesticides among people living in rural areas, including pregnant women, children and other vulnerable people;
- In conjunction with the Ministries of Agriculture and Environment, develop a comprehensive national action plan to reduce the use of highly hazardous pesticides in Brazil, via binding and measurable reduction targets with time limits, and accompanied by incentives to support alternatives to, and reductions of, highly hazardous pesticides;
- Develop and implement a protocol to receive complaints about pesticide spraying around sensitive sites, including human habitation and schools, including detailed measures related to:
 - ensuring health authorities conduct follow-up health monitoring and monitoring of drinking water supplies;
 - informing agriculture authorities in order to ensure pesticide spraying is carried out in accordance with the law.
- Ensure existing legislation on testing drinking water is applied, particularly the requirement of water service providers to submit 2 tests a year on all 27 of the pesticides listed in the Ministry of Health's regulation on drinking water quality;
- Monitor the presence of pesticides in drinking water in indigenous communities;
- Provide technical support to states and municipalities to carry out the surveillance of drinking water in rural and quilombo communities;
- Ensure that the national network of health surveillance laboratories that monitor pesticide residues in water and food have adequate equipment and training of staff to carry out the pesticide residue testing on food and drinking water;
- Amplify, in terms of the number and type of food products and the breadth of tests, the testing of food for pesticide residues under the Program on Pesticide Residue Analysis in Food (PARA);
- Publish annual bulletins of the results of pesticide monitoring in water and food;

- Increase professional training of healthcare workers in pesticide poisonings, including training in clinical diagnoses of acute poisonings and chronic pesticide exposure and their notification requirements;
- Improve the information available to healthcare workers on types of pesticides and their acute and chronic health impacts, including through an online database with toxicological information for the most widely-used pesticides in Brazil and clinical management of acute and/or chronic health effects;
- Increase technical support to state health surveillance programs on populations exposed to pesticide;
- Elaborate awareness-raising campaigns on pesticides, its health-related risks, and how to proceed in case of exposure and/or poisoning.

TO THE MINISTRY OF THE ENVIRONMENT

- As part of a nation-wide review of current pesticide policies, conduct a review of the major environmental impacts of current pesticide policies;
- In conjunction with the Ministries of Health and Agriculture, develop a comprehensive national action plan to reduce the use of highly hazardous pesticides, via binding and measurable reduction targets with time limits, and accompanied by incentives to support alternatives to, and reductions of, highly hazardous pesticides.

TO THE MINISTRY OF EDUCATION

- In conjunction with the Ministry of Health, conduct a nation-wide assessment of schools particularly at risk of exposure to pesticide spraying;
- In conjunction with state and municipal secretariats of education, direct school headmasters and headmistresses to notify pesticide poisoning cases of students, including suspected cases, to health authorities as prescribed in the Ministry of Health's list of diseases requiring compulsory notification;
- Work in collaboration with health authorities at federal, state and municipal levels to monitor exposure and health impacts on the school populations exposed to pesticide spraying;
- Work in collaboration with agricultural authorities at federal, state and municipal levels to reduce exposure to pesticides, including implementing buffer zones around schools for both ground and aerial spraying;
- Include education on the harms of pesticides and protection strategies in the curriculum, as part of environmental education.

RECOMMENDATIONS

TO NATIONAL CONGRESS

- Reject bills that would weaken Brazil’s regulatory framework for pesticides, including bill 6299/2002;
- Designate appropriate financial support to the Federal Public Prosecutor’s Office, the Ministry of Health, the Ministry of Agriculture, the Ministry of Education, the Ministry of Human Rights, State Secretariats of Health and Agriculture, and the Ministry of Environment.

TO THE FEDERAL AND STATE PUBLIC PROSECUTOR’S OFFICES

- Promptly investigate and prosecute alleged cases of spraying within buffer zones or health or environmental damages resulting from pesticide spraying;
- Promptly investigate and prosecute alleged cases of threats against residents or community leaders for complaining about the health effects of pesticides or pushing for better protections against pesticide exposure;
- Develop guidelines on how to investigate and prosecute cases of acute or chronic pesticide poisonings, including detailed measures related to:
 - a referral pathway for public health officials or environmental officials to refer alleged cases of unlawful pesticide usage that has led to public health or environmental impacts;
 - coordination with specialized health services for people exposed;
 - protecting complainants and witnesses from threats and acts of retaliation;
 - collecting evidence of transgressions of norms and regulations related to pesticides.
- Train public prosecutors to investigate and prosecute cases related to unlawful pesticide spraying.

TO MINISTRY OF HUMAN RIGHTS

- Protect people at risk for denouncing pesticides-related issues under the existing human rights defenders program and other programs;
- Designate and train experts to specialize in pesticide-related cases.

TO STATE SECRETARIATS OF AGRICULTURE

- If established by the Ministry of Agriculture, rigorously enforce the proposed buffer zone for ground spraying;
- In the absence of action by the Ministry of Agriculture, establish and rigorously enforce the proposed buffer zone for ground spraying;
- Provide support to municipalities in pesticide regulation, including the enforcement and monitoring of buffer zones.

TO STATE SECRETARIATS OF HEALTH

- **Ensure existing legislation on testing drinking water is applied, particularly the requirement of water service providers to submit two tests a year on all 27 of the pesticides listed in the Ministry of Health regulation on drinking water quality;**
- **Develop and implement the state health surveillance program on populations exposed to pesticides, including detailed measures related to:**
 - **surveillance on drinking water including all 27 pesticides listed in the Ministry of Health regulation on drinking water quality, as well as other pesticides intensively used in the state;**
 - **monitor pesticide residues in food;**
 - **identification and monitoring of rural and quilombo communities, schools and other sensitive sites exposed to pesticide spraying.**
- **Monitor and publicly report on incidents of exposure and any adverse health impacts of pesticide spraying in rural communities, schools, and other sensitive sites, as well as any measures taken or not taken by local authorities to reduce exposure pesticide spraying.**

TO MUNICIPAL SECRETARIATS OF AGRICULTURE

- **If established by the Ministry of Agriculture or State Secretariat of Agriculture, rigorously enforce the proposed buffer zone for ground spraying;**
- **In the absence of action by the Ministry of Agriculture, establish and rigorously enforce the proposed buffer zone for ground spraying;**

TO MUNICIPAL SECRETARIATS OF HEALTH

- **Ensure existing legislation on testing drinking water is applied, particularly the requirement of water service providers to submit two tests a year on all 27 of the pesticides listed in the Ministry of Health regulation on drinking water quality;**
- **Develop and implement the municipal health surveillance program on populations exposed to pesticides, including detailed measures related to:**
 - **surveillance on drinking water including all 27 pesticides listed in the Ministry of Health regulation on drinking water quality, as well as other pesticides intensively used in the state;**
 - **identification of and surveillance on rural and quilombo communities, schools and other sensitive sites exposed to pesticide spraying.**
- **Monitor and publicly report on incidents of exposure and any adverse health impacts of pesticide spraying in rural communities, schools and other sensitive sites, as well as any measures taken or not taken by local authorities to reduce exposure pesticide spraying.**

Methodology

While pesticide drift is an issue of serious concern in many parts of the world, Human Rights Watch undertook research in Brazil based on a number of considerations, including the globally significant amount of pesticides used in the country; that many of the pesticides used in Brazil are highly hazardous; and that there is intense political pressure to further weaken Brazil's regulatory system for pesticides.

From July 2017 to April 2018, Human Rights Watch spent a total of seven weeks travelling in rural areas of Brazil, interviewing people about the effects of pesticides sprayed on nearby farms. Some people we approached did not want to talk, either not providing a reason or, on other occasions, expressing fear of retaliation if they speak out.

From those who agreed to share their experiences, Human Rights Watch interviewed 73 affected people in seven sites, including farming communities, indigenous communities, *quilombos* (Afro-Brazilian communities), and rural schools.

The sites are located throughout the five major geographic regions of the country. The communities are all located in rural settings, as agricultural pesticide exposure is a predominantly rural phenomenon. The communities were located after consultations with people knowledgeable about pesticide issues in Brazil and represent a range of different profiles of people exposed to pesticides. Rural schools were included as research sites because children are particularly vulnerable to the adverse effects of toxic exposures as their brains and bodies are still developing.¹

Human Rights Watch also interviewed 42 people knowledgeable about pesticide issues in Brazil, including government officials working in the health and environment entities of state and local government authorities, prosecutors, lawyers, academic researchers, activists, and representatives of nongovernmental organizations (NGOs). In total, Human Rights Watch interviewed 115 people for this report.

¹ See, for example, Catherine Karr, "Children's Environmental Health in Agricultural Settings," *Journal of Agromedicine*, vol. 17, no. 2 (2012), p. 128.

We also obtained videos or photographs of pesticide spraying in four of the seven sites. Interviews were conducted in Portuguese, at times through an interpreter. Human Rights Watch informed all interviewees of the purpose of the interview, its voluntary nature, and the ways in which the information would be collected and used. Interviewers assured participants that they could end the interview at any time or decline to answer any questions, without any negative consequences. All interviewees provided verbal informed consent to participate. Human Rights Watch did not provide anyone with compensation or other incentives for participating.

To protect the confidentiality and safety of interviewees, their names and the names of the communities featured in this report and other identifying information have been withheld. In some cases, interviewees requested that, despite assigning pseudonyms to each individual, we should not mention the threats they had received.

Background

A Boom in Pesticides

Brazil is one of the world's largest consumers of pesticides: annual sales are around US\$10 billion.² In 2014, some 1,550 thousand tons were sold to Brazilian purchasers.³ This corresponds to around 7.5 kilograms of pesticides used per person in Brazil each year.⁴

The agriculture (and related livestock) industry in Brazil drives the national economy. Over the last four decades the lands used for grains increased by more than 60 percent, and the productivity increased three-fold. As a result, Brazil produced 238 million tons of grains in the 2016/2017 harvest.⁵ The main crops—soybeans, corn, and sugarcane—corresponded to 61.2 percent of the value of agriculture production.⁶ One of the characteristics of the industry is cultivation on large plantations: extensions of over 1,000 hectares account for less than 1 percent of farms in the country but cover 45 percent of all agricultural land.⁷

The introduction of mechanized farming techniques and new technologies, such as genetically modified organisms—including soybeans, corn, and cotton resistant to glyphosate—coupled with the intensive use of fertilizers and pesticides, have driven gains

² "Sindiveg: Setor de defensivos agrícolas registra queda nas vendas em 2016," SINDIVEG news release, April 3, 2017, <http://sindiveg.org.br/sindiveg-setor-de-defensivos-agricolas-registra-queda-nas-vendas-em-2016/> (accessed May 31, 2018).

³ Ministry of Health, Government of Brazil, *Relatório Nacional de Vigilância em Saúde de Populações Expostas a Agrotóxicos*, (Brasília: Government of Brazil, 2018) volume 1, book 2, http://bvsms.saude.gov.br/bvs/publicacoes/relatorio_nacional_vigilancia_populacoes_expostas_agrotoxicos.pdf (accessed June 18, 2018) p. 18.

⁴ In making this estimate, the 2014 national population estimate of 204, 213, 133 is taken from United Nations Department of Economic and Social Affairs, *World Population Prospects: the 2017 Revision* (United Nations: 2017), <http://esa.un.org/unpd/wpp/Download/Standard/Population/> (accessed June 18, 2018).

⁵ *Confederação da Agricultura e Pecuária do Brasil, Agribusiness Overview*, (Brasília: Confederação da Agricultura e Pecuária do Brasil, 2018), <http://www.cnabrazil.org.br/estudos/visao-geral-do-agro> (accessed June 14, 2018).

⁶ Instituto Brasileiro de Geografia e Estatística, Government of Brazil, *Produção Agrícola Municipal: Culturas Temporárias e Permanentes*, (Rio de Janeiro: Government of Brazil, 2016), volume 43, https://biblioteca.ibge.gov.br/visualizacao/periodicos/66/pam_2016_v43_br.pdf (accessed June 14, 2018).

⁷ Oxfam Brazil, "Terrenos da desigualdade: terra, agricultura e desigualdades no Brasil rural," November 2016, https://www.oxfam.org.br/sites/default/files/arquivos/relatorio-terrenos_desigualdade-brasil.pdf (accessed June 18, 2018).

in productivity.⁸ However, agricultural expansion has also driven deforestation, especially in the Amazon and Cerrado regions of Brazil.⁹

The massive amount of pesticides used in Brazil is driven by Brazil's expanding large-scale, monocrop agriculture. Of all pesticides sold in Brazil, about 80 percent are used on plantations of soybeans, corn, cotton, and sugarcane.¹⁰

Many of the pesticides used in Brazil are highly hazardous.¹¹ Of the 10 most widely used pesticides in Brazil in 2016, 9 are considered highly hazardous pesticides by the NGO Pesticide Action Network International.¹² Of these 10, 4 are not authorized for use in Europe, indicating how hazardous several are considered by some standards.¹³

⁸ "Melhora da produtividade é responsável por 80 % do crescimento da agropecuária," Ministry of Agriculture, Livestock and Food Supply press release, February 28, 2018, <http://www.agricultura.gov.br/noticias/melhora-da-produtividade-e-responsavel-por-80-do-crescimento-da-agropecuaria> (accessed June 27, 2018); Anay Cury, "Transgênicos são 93% da área plantada com soja, milho e algodão," *O Globo*, August 17, 2016, <http://g1.globo.com/economia/agronegocios/noticia/2016/08/transgenicos-sao-93-da-area-plantada-com-soja-milho-e-algodao.html> (accessed June 27, 2018).

⁹ "IBGE: Agricultura é maior responsável por desmatamento de florestas no país," *UOL Notícias*, September 25, 2015, <https://noticias.uol.com.br/meio-ambiente/ultimas-noticias/redacao/2015/09/25/fronteiras-agricolas-sao-maiores-responsaveis-por-desmatamento-diz-ibge.htm> (accessed June 18, 2018).

¹⁰ Fernando Ferreira Carneiro et al., *Dossiê ABRASCO: um alerta sobre os impactos dos agrotóxicos na saúde*, (Rio de Janeiro, São Paulo: Escola Politécnica de Saúde Joaquim Venâncio, 2015), p. 454.

¹¹ According to the Food and Agricultural Organization of the United Nations (FAO) and World Health Organization (WHO), "highly hazardous pesticides" means "pesticides that are acknowledged to present particularly high levels of acute or chronic hazards to health or environment according to internationally accepted classification systems such as WHO or GHS or their listing in relevant binding international agreements or conventions. In addition, pesticides that appear to cause severe or irreversible harm to health or the environment under conditions of use in a country may be considered to be and treated as highly hazardous." FAO and WHO, *International Code of Conduct on Pesticide Management – Guidelines on Highly Hazardous Pesticides*, (Rome: FAO, 2016), p. 6.

¹² While FAO and WHO have developed the criteria for highly hazardous pesticides, they do not provide a list of such pesticides. The Pesticide Action Network, a civil society organization that calls for effective international action on the elimination of hazardous pesticides, has published lists of highly hazardous pesticides based on classifications by recognized authorities since 2009. In 2016, the 10 most-used pesticides (by their active ingredients) in Brazil were as follows (in decreasing order): glyphosate, 2,4-dichlorophenoxyacetic acid, mancozeb, atrazine, mineral oil, acephate, vegetal oil, carbendazim, paraquat, and imidacloprid. Of these 10, all pesticides but vegetal oil are listed by the Pesticide Action Network as highly hazardous. See Pesticide Action Network International, *PAN International List of Highly Hazardous Pesticides*, (Hamburg: Pesticide Action Network International, 2016), http://www.panna.org/sites/default/files/PAN_HHP_List%202016.pdf

¹³ Of these 10, atrazine, acephate, carbendazim, and paraquat are not approved for use in the European Union. See EU Pesticides Database at <http://ec.europa.eu/food/plant/pesticides/eu-pesticides-database/public/?event=homepage&language=EN>; A fifth pesticide, imidacloprid, will be prohibited from outdoor use in the EU from the end of 2018. See Josh Gabbatiss, "EU votes to ban bee-harming pesticides," *The Independent*, April 27, 2018, <https://www.independent.co.uk/environment/bee-harming-pesticides-eu-ban-vote-environmental-threat-harm-latest-news-a8324981.html> (accessed June 19, 2018).

There is no corresponding national regulation establishing a buffer zone around sensitive sites when ground spraying, even though ground spraying is the most common method of pesticide application, and despite it generating considerable pesticide drift. States also have jurisdiction over pesticides and some of them have buffer zones for mechanized ground spraying (ranging from 50 to 600 meters).¹⁹

States, usually state secretariats of agriculture, are responsible by law for overseeing the use of pesticides, including compliance with buffer zones where they exist.²⁰ In some cases, municipal environmental and agriculture authorities also conduct inspections. Federal and State public prosecutor offices often play an active role in investigating and enforcing pesticide laws and regulations.²¹

Pesticide use in violation of federal, state, and municipal laws and regulations constitutes a criminal offence, sanctioned with two to four years in prison and a fine. Any employer or service provider who doesn't take measures necessary to protect health and environment is subject to the same penalty.²² In addition to criminal liability, the public prosecutor can demand reparation and compensation for damage to the environment and collective interests.²³

zones, etc.)” FAO and WHO, *International Code of Conduct on Pesticide Management – Guidelines on Highly Hazardous Pesticides*.

¹⁹ The states of Acre (State Law 2,843 of 2014), Ceará (State Decree 23,705 of 1995), Goiás (State Law 19,423 of 2016), Mato Grosso (State Decree 1,651 of 2013), Paraná (State Secretary of Interior Resolution 22 of 1985), Piauí (State Law 5,626 of 2006), Rio Grande do Norte (State Law 8,672 of 2005), and Tocantins (State Law 224 of 1991) have buffer zones for mechanized ground spraying.

²⁰ Pesticide Law, No. 7,802 of 1989, art. 10; Pesticide Law Implementing Decree, No. 4,074 of 2002, art. 71.

²¹ The public prosecutor's office is responsible for ensuring constitutional rights are upheld. See Federal Constitution of the Republic of Brazil, 1988, art. 129. Since 2001, federal and state public prosecutor offices have been involved in state and national forums against the impacts of pesticides. The forums consist of several institutions, including government ministries, federal and state public prosecutor offices, civil society organizations, labor unions, and universities. See for example, “MPT lança Fórum Nacional de Combate aos Efeitos dos Agrotóxicos,” Terra de Direitos press release, October 29, 2009, <http://terradedireitos.org.br/noticias/noticias/mpt-lanca-forum-nacional-de-combate-aos-efeitos-dos-agrotoxicos/1667> (accessed June 26, 2018); “Tocantins cria o Fórum de Combate aos Impactos dos Agrotóxicos,” Tocantins State Public Prosecutors Office press release, May 26, 2017, <https://mpto.mp.br/web/forum-combate-agrotoxicos/2017/05/26/482817-tocantins-cria-o-forum-de-combate-aos-impactos-dos-agrotoxicos> (accessed June 26, 2018).

²² Pesticide Law, No. 7,802 of 1989, arts. 15-16.

²³ Civil Public Action Law, No. 7,347 of 1985, art. 1.

In practice, there are a number of problems with the system of pesticide buffer zones around sensitive sites in Brazil. In relation to ground spraying, the absence of a national regulation establishing a buffer zone around sensitive sites has led to inconsistent approaches by states and a lack of regulation in most of the country. Of the 27 states in Brazil, 19 do not have buffer zones for ground spraying.²⁴

Exposure to pesticides can have severe impacts on the enjoyment of human rights, including the rights to health, to adequate food, to safe drinking water, and the right to a healthy environment.²⁵ Brazil is obligated to protect its citizens from human rights abuses, including those connected with business activity. In practical terms, the obligation to protect human rights in the context of business activity requires taking “appropriate steps to prevent, investigate and redress such abuse through effective policies, legislation, regulation and adjudication.”²⁶

Brazil urgently needs to introduce measures to limit pesticide exposure that is harmful to human health. The Brazilian authorities should undertake a thorough and time-bound review of the health and environmental impacts of the current approach to pesticides.²⁷

²⁴ The states of Acre (State Law 2,843 of 2014), Ceará (State Decree 23,705 of 1995), Goiás (State Law 19,423 of 2016), Mato Grosso (State Decree 1,651 of 2013), Paraná (State Secretary of Interior Resolution 22 of 1985), Piauí (State Law 5,626 of 2006), Rio Grande do Norte (State Law 8,672 of 2005), and Tocantins (State Law 224 of 1991) have buffer zones for mechanized ground spraying.

²⁵ The right to the highest attainable level of health obligates States to take measures to improve all aspects of environmental and industrial hygiene. International Covenant on Economic, Social and Cultural Rights (ICESCR), adopted December 16, 1966, G.A. Res. 2200A (XXI), 21 U.N. GAOR Supp. (No. 16) at 49, U.N. Doc. A/6316 (1966), 993 U.N.T.S. 3, entered into force January 3, 1976, acceded to by Brazil on January 24, 1992, art 12(b). Access to safe drinking water and adequate food are human rights and include the right of people to know what is in their food and drinking water. UN General Assembly Resolution, The human right to water and sanitation, U.N. Doc. A/RES/64/292, July 29, 2010 and ICESCR, art. 11. In 2018, the Inter-American Court of Human Rights affirmed in 2018 that the American Convention on Human Rights protects the right to a healthy environment. See *The Environment and Human Rights (State Obligations in Relation to the Environment in the Context of the Protection and Guarantee of the Rights to Life and to Personal Integrity – Interpretation and Scope of Articles 4(1) and 5(1) of the American Convention on Human Rights)*, Inter-American Court of Human Rights, OC-23/17, Advisory Opinion, November 15, 2017, http://www.corteidh.or.cr/docs/opiniones/seriea_23_esp.pdf (accessed July 2, 2018).

²⁶ Special Representative of the Secretary-General on the issue of human rights and transnational corporations and other business enterprises, “Guiding Principles on Business and Human Rights: Implementing the United Nations ‘Protect, Respect and Remedy’ Framework,” U.N. Doc. A/HRC/17/31, March 21, 2011, principle 1.

²⁷ Reviews in other jurisdictions, such as the European Union, have led to consolidated plans for the training of users, advisors and distributors of pesticides, inspection of pesticide application equipment, the prohibition of aerial spraying, limitation of pesticide use in sensitive areas, and information and awareness raising about pesticide risks. The EU Directive that was developed as a result of this review process noted: “Aerial spraying of pesticides has the potential to cause significant adverse impacts on human health and the environment, in particular from spray drift. Therefore, aerial spraying should generally be prohibited with derogations possible where it represents clear advantages in terms of reduced impacts on human health and the environment in comparison with other spraying methods, or where there are no viable alternatives, provided that the best available technology to reduce drift is used.” See “Directive 2009/128/EC of the European Parliament

While undertaking this review, Brazil should impose a moratorium on aerial spraying and impose and enforce an immediate prohibition on ground spraying near sensitive sites.

A Monitoring System Overwhelmed

Due to the wide range of pesticides and their toxicities, the health effects of acute pesticide poisoning vary significantly.²⁸ People commonly experience sweating, elevated heart rate, and vomiting, as well as nausea, headache, and dizziness. At the same time, chronic exposure—repeated exposure to low doses over an extended period—is associated with infertility, negative impacts on fetal development, cancer, and other serious health effects.²⁹ Pregnant women, children, and other vulnerable people may face elevated risks.³⁰

No one knows how common the problem of pesticide poisoning is in Brazil.

Healthcare providers are obliged to register any incidents—including suspected cases—in the Ministry of Health’s compulsory disease reporting system.³¹ School headmasters and headmistresses should also notify pesticide poisoning cases of students, including suspected cases, to health authorities.³² According to the Ministry of Health, there were

and of the Council of 21 October 2009 establishing a framework for Community action to achieve the sustainable use of pesticides,” European Parliament, Council of the European Union, November 25, 2009, <https://eur-lex.europa.eu/legal-content/EN/ALL/?uri=CELEX:02009L0128-20091125> (accessed June 19, 2018).

²⁸ Acute pesticide poisoning can be defined as “any illness or health effect resulting from suspected or confirmed exposure to a pesticide within 48 hours.” See Josef Thundiyil et al., “Acute pesticide poisoning: a proposed classification tool,” *Bulletin of the World Health Organization*, vol. 86(3) (2008), pp. 205-209.

²⁹ See, for example, Linda A. McCauley et al., “Studying Health Outcomes in Farmworker Populations Exposed to Pesticides,” *Environmental Health Perspectives*, vol. 114, no. 6 (2006), p. 953; K.L. Bassil, et al., “Cancer Health Effects of Pesticides: Systematic Review,” *Canadian Family Physician*, vol. 53 no. 10 (2007), pp. 1704-1711; F. Kamel, et al., “Pesticide Exposure and Self-reported Parkinson’s Disease in the Agricultural Health Study,” *American Journal of Epidemiology*, vol. 165 (2007), pp. 364-374.

³⁰ See, for example, James R. Roberts, Catherine J. Karr, and Council on Environmental Health, “Pesticide Exposure in Children,” *Pediatrics*, vol. 130, no. 6 (2012), p. e1765- e1788; Brenda Eskenazi et al., “Pesticide Toxicity and the Developing Brain,” *Basic & Clinical Pharmacology & Toxicology*, vol. 102 (2008), pp. 228-236; Maryse F. Bouchard et al., “Prenatal Exposure to Organophosphate Pesticides and IQ in 7-Year-Old Children,” *Environmental Health Perspectives*, vol. 119 (2011), pp. 1189-1195; Jose R. Suarez-Lopez, et al., “Acetylcholinesterase Activity and Neurodevelopment in Boys and Girls,” *Pediatrics*, vol. 132, no. 6 (2013), pp. 1649-1658; Sarah Mackenzie Ross, et al., “Neurobehavioral Problems Following Low-Level Exposure to Organophosphate Pesticides: A Systematic and Meta-Analytic Review,” *Critical Reviews in Toxicology*, vol. 43, no. 1 (2013), pp. 21-44.

³¹ The obligation to register all cases, including suspected cases, is established by Ministry of Health Consolidating Ordinance No. 4 of 2017, annex V, chapter 1, art. 3.

³² Ministry of Health Consolidating Ordinance No. 4 of 2017, annex V, chapter 1, art. 3.

4,003 cases of agricultural pesticide poisoning in Brazil, or almost 11 a day, in 2017. One hundred and forty-eight people died from pesticide poisoning that year.³³

However, it seems clear that official data grossly understates the severity of this problem.³⁴ Individuals may not seek health services or, if they do, are not diagnosed as cases of poisoning. The Ministry of Health acknowledges that under-reporting is a concern that “leads to invisibility of the [pesticide poisoning] problem and a lack of access to information by workers and exposed populations.”³⁵

One likely indication of the extent of underreporting is that, according to the Ministry of Health’s data, 32 percent of the municipalities considered as priorities for health monitoring of people exposed to pesticides did not register a single case of pesticide poisoning from 2007 to 2015.³⁶

Diagnosing acute pesticide poisoning is challenging because it can lead to a wide diversity of health effects. Nevertheless, diagnosis is possible: there is a standard definition and classification scheme available for acute pesticide poisonings to enable identification and diagnosis at the field level, rural clinics, and primary healthcare systems.³⁷

There are also health effects—often more serious—associated with low-level pesticide exposure over time. The Ministry of Health reports that from 2007 to 2015, there were just 1,141 cases of chronic exposure to pesticides but concedes that “it is possible that chronic

³³ Ministry of Health, Government of Brazil, “Sistema de Informação de Agravos de Notificação,” <http://www2.datasus.gov.br/DATASUS/index.php?area=0203&id=29878153> (accessed June 25, 2018).

³⁴ Neice Müller Xavier Faria, Anaclaudia Gastal Fassa, and Luiz Augusto Facchini, “Intoxicação por agrotóxicos no Brasil: os sistemas oficiais de informação e desafios para realização de estudos epidemiológicos,” *Ciência & Saúde Coletiva*, vol. 12(1) (2007), pp. 25-38.

³⁵ Ministry of Health, Government of Brazil, *Relatório Nacional de Vigilância em Saúde de Populações Expostas a Agrotóxicos*, (Brasília: Government of Brazil, 2018) volume 1, book 2, http://bvsms.saude.gov.br/bvs/publicacoes/relatorio_nacional_vigilancia_populacoes_expostas_agrotoxicos.pdf (accessed June 18, 2018) p. 30.

³⁶ As part of the health surveillance on populations exposed to pesticides, the Ministry of Health oriented the states to identify priority municipalities based on the following criteria: agricultural production; sales and consumption of pesticides; size of the population exposed to pesticides; number of poisoning cases registered; and presence of pesticide residues in drinking water. Ministry of Health, Government of Brazil, *Relatório Nacional de Vigilância em Saúde de Populações Expostas a Agrotóxicos*, (Brasília: Government of Brazil, 2016) volume 1, book 1, <http://portalarquivos2.saude.gov.br/images/pdf/2016/dezembro/05/Relatorio-Nacional-de-VSPEA-vol-1.pdf> (accessed June 18, 2018) p. 60..

³⁷ See, for example, Josef Thundiyil et al., “Acute pesticide poisoning: a proposed classification tool,” *Bulletin of the World Health Organization*, vol. 86(3) (2008), pp. 205-209.

exposure [to pesticides] is under-notified, due to the low capacity of health services to recognize and capture this type [of exposure].”³⁸

Brazil’s national cancer institute (INCA), a governmental agency, has taken a public position against current pesticide policies in Brazil. Its concerns include the introduction of genetically modified organisms (as genetically modified seeds require intensive use of pesticides), the widespread use of aerial spraying, and Brazil’s approval, for use in the country, of pesticides prohibited in other countries.³⁹ It also highlights the risks to health, including cancer, from chronic exposure. It states:

The adverse effects of chronic exposure to pesticides might appear a long time after the exposure, making it difficult to link to the agent. The effects associated with chronic exposure to active substances of pesticides include infertility, impotence, miscarriage, malformations, neurotoxicity, hormonal dysregulation, effects on immune system and cancer.⁴⁰

Pesticide Residues in Food and Water

The people whose testimony is included in this report are on the front lines of exposure to pesticides. But it would be a mistake to think that exposure is limited to them: chronic exposure can also occur through pesticide residues in food and drinking water.

ANVISA is Brazil’s health protection agency. ANVISA’s Program on Pesticide Residue Analysis in Food (PARA) monitors 25 common foods such as fruits, vegetables, and cereals for 232 types of pesticides. Of the 12,000 samples collected in 2013-2015, about 20 percent contained pesticide residues that either exceeded permitted levels or contained

³⁸ Ministry of Health, Government of Brazil, *Relatório Nacional de Vigilância em Saúde de Populações Expostas a Agrotóxicos*, (Brasília: Government of Brazil, 2018) volume 1, book 2, http://bvsms.saude.gov.br/bvs/publicacoes/relatorio_nacional_vigilancia_populacoes_expostas_agrotoxicos.pdf (accessed June 18, 2018), p. 51. For an example of a state-led protocol addressing chronic exposure to pesticides, see Paraná State Health Secretariat, *Protocolo de Avaliação das Intoxicações Crônicas por Agrotóxicos*, (Curitiba: 2013, Paraná State Health Secretariat), http://www.saude.pr.gov.br/arquivos/File/CEST/Protocolo_AvaliacaoIntoxicacaoAgrotoxicos.pdf (accessed July 3, 2018).

³⁹ “Posicionamento do Instituto Nacional de Câncer José Alencar Gomes da Silva acerca dos Agrotóxicos,” National Cancer Institute statement, April 5, 2015, http://www1.inca.gov.br/inca/Arquivos/comunicacao/posicionamento_do_inca_sobre_os_agrotoxicos_06_abr_15.pdf (accessed July 2, 2018).

⁴⁰ Ibid.

unauthorized pesticides.⁴¹ PARA acknowledges its monitoring does not currently include the two most commonly used pesticides in Brazil, glyphosate and 2,4-D (2,4-dichlorophenoxyacetic acid), because they require different testing methods from those employed at the laboratories used by PARA.⁴²

The government's monitoring system for contamination in drinking water is also weak. According to a Ministry of Health regulation, water suppliers—whether state or municipal governments or private companies—are responsible for testing for 27 designated pesticides every six months in the water systems they manage and reporting those results to the Ministry of Health's drinking water monitoring database.⁴³

But each year, an average of 67 percent of municipalities across the country do not submit any information to the federal government. When they do submit, most municipalities do not submit complete data. Of the test results submitted in 2014, only 18 percent were full tests for all 27 pesticides conducted twice a year as required by the law.⁴⁴

Even with this woefully incomplete monitoring system, the Ministry of Health manages to identify some municipalities where drinking water has pesticide residues above the legal limits. Of the small number of municipalities that submitted test results during this four-year period, 15 percent reported at least one substance above the legal limit.⁴⁵

The limited monitoring for pesticide residues in water and food is partly due to a scarcity of laboratory facilities. In 2016, ANVISA assessed that only seven public laboratories were

⁴¹ Health Regulatory Agency (ANVISA), Government of Brazil, *Programa de Análise de Resíduo de Agrotóxicos em Alimentos. Relatório de atividades de 2013 e 2015*, (Brasília: Anvisa, 2016) http://portal.anvisa.gov.br/documents/111215/o/Relat%C3%B3rio+PARA+2013-2015_VERS%C3%83O-FINAL.pdf/494cd7c5-5408-4e6a-boe5-5098cbf759f8 (accessed July 3, 2018). The environmental NGO Greenpeace also found alarming pesticide residues in fruits, vegetables and other staple foods: see Greenpeace, *Segura esse abacaxi: os agrotóxicos que vão parar na sua mesa*, (São Paulo: Greenpeace, 2017) <http://greenpeace.org.br/agricultura/segura-este-abacaxi.pdf> (accessed May 31, 2018), and Greenpeace, *Dossiê Alimentação Escolar e Agrotóxicos*, (São Paulo: Greenpeace, 2016) http://www.greenpeace.org/brasil/Global/brasil/documentos/2015/Dossie_Alimentacao_Escolar_Agrotoxicos.pdf (accessed May 31, 2018).

⁴² Health Regulatory Agency (ANVISA), Government of Brazil, *Programa de Análise de Resíduo de Agrotóxicos em Alimentos. Relatório de atividades de 2013 e 2015*, p. 21.

⁴³ Ministry of Health Consolidating Ordinance No. 5 of 2017, exhibit XX, art. 13.

⁴⁴ Human Rights Watch obtained the data concerning pesticide residue in water from 2014 to 2017 of the national water monitoring system SISAGUA (Drinking Water Quality Surveillance Information System) through a Freedom of Information request. Data on file with Human Rights Watch.

⁴⁵ Richard Pearshouse and João Guilherme Bieber (Human Rights Watch), “Brasileiros não sabem se tem agrotóxicos na água que bebem,” *El País*, March 22, 2018, <https://www.hrw.org/pt/news/2018/03/22/316145>.

able to test food for pesticide residues in Brazil, and only six public laboratories were adequately equipped to test for pesticide residues in water. Only one reported having capacity to test water for glyphosate, the most commonly used pesticide in Brazil.⁴⁶

A Population in Fear

Those exposed to pesticides are often from poor communities while the neighboring large-scale, monocrop plantation owners are wealthy and politically powerful. People who raise concerns about pesticide exposure can face threats and experience fears of retaliation. While such fears are difficult to quantify, they are very real for many individuals and communities.

A number of states and municipalities have moved to establish laws banning aerial spraying and/or establishing buffer zones around human habitations and other sensitive sites.⁴⁷ The community organizing required for such initiatives to be successful often brings threats and intimidation into sharp focus.

In April 2010 a rural farmer and anti-pesticide activist, Jose Maria Filho, was shot 25 times with pistol when driving home one night in Limoeiro do Norte, in Ceará state. He had been instrumental in pushing the local municipal government to ban aerial spraying that year, over the opposition of big landowners. A month after his murder, the ban was overturned. The public prosecutor believes that he was killed as a consequence of his denunciations of aerial spraying and water contamination by pesticides in the region.⁴⁸ The public prosecutor filed a criminal case against four suspects in 2010, although, at the date of publication, no one has been tried.⁴⁹

⁴⁶ Health Regulatory Agency (ANVISA), Government of Brazil, *Perfil Analítico da Rede Nacional de Laboratórios de Vigilância Sanitária 2016*, (Brasília: 2016, ANVISA) <http://portal.anvisa.gov.br/documents/33860/266831/Rede+Nacional+de+Laborat%C3%B3rios+da+Vigil%C3%A2ncia+Sanit%C3%A1ria+por+perfil+anal%C3%ADtico/2819dd39-4f87-48d7-97fa-78225e1ba08b> (accessed July 3, 2017).

⁴⁷ As noted above, eight states have enacted buffer zones prohibiting ground spraying around sensitive sites. The municipalities of Vila Valério (Municipal Law No. 550 of 2011), Nova Venécia (Municipal Law No. 3,121 of 2011), and Boa Esperança (Municipal Law No. 1,649 of 2017), in Espírito Santo state, enacted laws banning aerial spraying. In the municipality of Cascavel (Municipal Law No. 6,484 of 2015), in Paraná state, established buffer zones around schools, health units, and rural communities.

⁴⁸ “Justiça conclui julgamento da morte de ambientalista de Limoeiro do Norte,” State Court of Ceará press release, March 22, 2017, <https://www.tjce.jus.br/noticias/justica-conclui-julgamento-da-morte-de-ambientalista-de-limoeiro-do-norte/> (accessed June 27, 2018).

⁴⁹ *Ibid.* One suspect died after being charged. In March 2017, a state court dismissed charges against two suspects for lack of evidence and accepted charges against a fourth suspect, who will be tried by jury. Edwirges Nogueira, “Acusados pela

As noted in the summary of this report, in May 2013 an airplane sprayed pesticides over the school São José do Pontal in the rural settlement Pontal dos Buritis, in Rio Verde, Goiás, poisoning around 90 children and adults. The distance between the school and the corn plantation is around 20 meters. Students stayed at the hospital for some days with symptoms ranging from dizziness, diarrhea, severe headaches to skin, liver, kidney, and breathing problems.⁵⁰

The teacher of the school at the time of the spraying who pushed for health care for those affected and for more stringent controls of pesticides in the municipality told Human Rights Watch that he received numerous threats. These included telephone calls telling him to “take care of what you talk about,” and “You can hide, I will kill you.”⁵¹

In 2017, local activists and civil society organizations began to advocate for a ban on aerial spraying in the municipality of Boa Esperança in the state of Espírito Santo. A priest who helped organize a local petition against aerial spraying told Human Rights Watch that he received disturbing messages: “Initially I received messages warning me to take care. Then, agronomists started sending me pornographic videos.... Then I received calls threatening ‘you won’t last longer than December.’”⁵² He reported the threats to the civil police, but to his knowledge, the police didn’t take any steps to investigate them.⁵³

morte de líder comunitário no Ceará irão a júri popular,” *Agência Brasil*, August 24, 2015, <http://agenciabrasil.ebc.com.br/geral/noticia/2015-08/acusados-pela-morte-de-lider-comunitario-no-ceara-irao-juri-popular> (accessed May 31, 2018).

⁵⁰ Ministry of Health, Government of Brazil, *Relatório Nacional de Vigilância em Saúde de Populações Expostas a Agrotóxicos* p. 51. In March 2018, a local court ordered the company that had produced the pesticide used in the spraying and the company that had undertaken the aerial spraying to compensate the local population for the collective moral damages caused by the spraying. The resources will be allocated in local health programs. There is an appeal pending. See “Empresas que contaminaram 92 pessoas com uso irregular de agrotóxicos são condenadas por danos morais coletivos,” Federal Public Prosecutor’s Office press release, March 19, 2018, <http://www.mpf.mp.br/go/sala-de-imprensa/noticias-go/empresas-que-contaminaram-cerca-de-92-pessoas-com-uso-irregular-de-agrotoxicos-sao-condenadas-por-danos-morais-coletivos> (accessed May 31, 2018).

⁵¹ Human Rights Watch interview with Hugo Alves dos Santos, Rio Verde municipality (Brazil), February 21, 2018. See also, “‘Crianças atingidas por chuva de agrotóxicos estão abandonadas’, denuncia professor,” *Rádio Brasil Atual*, July 24, 2017, <https://soundcloud.com/redebrasilatual/professor-e-ameacado-de-morte-por-reivindicar-atendimento-aos-alunos-atingidos-pela-chuva-de-veneno> (accessed May 29, 2018).

⁵² Human Rights Watch telephone interview with Father Romário Hastenreiter, April 20, 2018. See also, Fernanda Couzemenco, “Manifesto denuncia ameaças a lideranças mobilizadas contra agrotóxicos em Boa Esperança,” *Século Diário*, December 14, 2017, <http://seculodiario.com.br/36940/10/comissao-estadual-de-producao-organica-publica-mocao-de-apoio-aos-municipes-de-boa-esperanca> (accessed May 29, 2018).

⁵³ A group of associations promoting organic agriculture in Espírito Santo wrote an open letter denouncing the threats against Father Romário Hastenreiter and demanding an investigation. See “Manifesto denuncia pressão em lideranças contra agrotóxicos em Boa Esperança,” Associação dos Servidores do Incaper, December 15, 2017, <http://www.assin.org.br/assuntos-gerais/manifesto-denuncia-agrotoxicos-em-boa-esperanca/> (accessed June 27, 2018).

Political Pressure

As weak as the government's regulatory system is, there is political pressure to weaken it further. According to the Pesticides Law, ANVISA, IBAMA (Brazil's environmental protection agency), and MAPA (Brazil's ministry of agriculture) are responsible for approving the use of new pesticides. ANVISA and IBAMA carry out hazard assessments, determining potential harm to humans and the environment respectively; while MAPA analyzes agronomic performance and registers products.⁵⁴ Three consenting opinions are required for a product to be registered.⁵⁵

Since the Pesticides Law was adopted in 1989, dozens of bills have been introduced in Congress by the rural caucus—a group of lawmakers that represent rural districts—and supported by pesticide industry lobbyists, to further weaken the regulatory framework.⁵⁶

The most recent bill, introduced in 2002 and approved by a Special Commission of Congress in June 2018, would substantially reduce the role of ANVISA and IBAMA in the process to authorize new pesticides, thereby limiting the involvement of agencies with specialized expertise on health and environmental impacts of pesticides.⁵⁷ The draft bill also proposes replacing the legal term *agrotóxicos* (pesticides) with *produtos fitosanitários* (phytosanitary products), masking the health and environmental hazards of pesticides.⁵⁸

The bill would also weaken criteria for authorizing pesticides. Under the Pesticides Law, pesticides that are carcinogenic (cancer-causing), harm the development of the embryo or fetus, cause genetic mutations, or that harm the endocrine or reproductive systems cannot be registered.⁵⁹ However, the bill would allow more leeway in pesticide approval, limiting

⁵⁴ Pesticide Law, No. 7,802 of 1989, art. 3; Pesticide Law Implementing Decree, No. 4,074 of 2002, arts. 2-8. 71.

⁵⁵ Victor Pelaez, Letícia Rodrigues da Silva, and Eduardo Borges Araújo, "Regulation of pesticides: a comparative analysis," *Science and Public Policy*, vol. 40(5) (2013), pp. 644-656.

⁵⁶ Brazil's rural caucus advocates for public policies fostering the development of the national agribusiness. It is formally represented by the *Frente Parlamentar da Agropecuária*, comprising in mid-2018 of 228 representatives and 27 senators.

⁵⁷ Bill No. 6,299 of 2002 to Amend Pesticide Law, No. 7,802 of 1989, art. 4, http://www.camara.gov.br/proposicoesWeb/prop_mostrarintegra?codteor=1654426&filename=Parecer-PL629902-24-04-2018 (accessed May 31, 2018). See also Dom Phillips, "'Toxic Garbage will be sold here': Outcry as Brazil moves to loosen pesticide laws," *The Guardian*, June 26, 2018, <https://www.theguardian.com/world/2018/jun/26/toxic-garbage-will-be-sold-here-outcry-as-brazil-moves-to-loosen-pesticide-laws> (accessed June 26, 2018).

⁵⁸ Bill No. 6,299 of 2002 to Amend Pesticide Law, No. 7,802 of 1989, arts. 2-3.

⁵⁹ Pesticide Law, No. 7,802 of 1989, art. 3.

prohibition of use to those pesticides whose risk is considered “unacceptable to human beings and environment” after the adoption of risk management measures.⁶⁰

Several government institutions, such as the national cancer institute (INCA), the Federal Public Prosecutor’s Office, and the public health institution Fundação Oswaldo Cruz, have positioned themselves against these changes.⁶¹ In June 2018, five United Nations special rapporteurs on human rights wrote to the Brazilian government expressing concerns over the bill.⁶²

⁶⁰ . See Bill No. 6,299 of 2002 to Amend Pesticide Law, No. 7,802 of 1989, art. 4. See also Jenny Gonzales, “Brazil’s fundamental pesticide law under attack,” *Mongabay*, February 20, 2018, <https://news.mongabay.com/2018/02/brazils-fundamental-pesticide-law-under-attack/> (accessed June 18, 2018).

⁶¹ “Nota técnica: Análise do Projeto de Lei nº 6.299/2002,” Oswaldo Cruz Foundation statement, September 28, 2015, https://portal.fiocruz.br/sites/portal.fiocruz.br/files/documentos/nota_tecnica_pl_agratotoxicos.pdf (accessed May 29, 2018); “Nota pública acerca do posicionamento do Instituto Nacional de Câncer sobre o projeto de lei nº 6.299/2002,” National Cancer Institute statement, May 11, 2018, <http://www1.inca.gov.br/inca/Arquivos/nota-publica-inca-pl-6299-2002-11-de-maio-de-2018.pdf> (accessed May 29, 2018); “Nota técnica 4ª CCR nº 1/2018 sobre o Projeto de Lei nº6.299/2002,” Federal Public Prosecutor’s Office statement, May 3, 2018, http://www.mpf.mp.br/pgr/documentos/4ccr_notatecnica_pl-6-299-2002_agrotoxico.pdf (accessed May 29, 2018).

⁶² Joint Communication from the Special Rapporteur on the issue of human rights obligations relating to the enjoyment of a safe, clean, healthy and sustainable environment; the Special Rapporteur on the right to food; the Special Rapporteur on the implications for human rights of the environmentally sound management and disposal of hazardous substances and wastes; the Special Rapporteur on the right of everyone to the enjoyment of the highest attainable standard of physical and mental health; and the Special Rapporteur on the human rights to safe drinking water and sanitation, to Her Excellency Ms. Maria Nazareth Farani Azavêdo, Permanent Representative of Brazil to the United Nations Office and other international organizations in Geneva, OL BRA 5/2018, June 13, 2018, <https://www.ohchr.org/Documents/Issues/ToxicWastes/Communications/OL-BRA-5-2018.pdf> (accessed June 18, 2018).

Findings

One of the key findings of this research is that in all seven sites, people described symptoms consistent with acute pesticide poisoning after seeing pesticide spraying nearby or smelling pesticides recently applied to nearby fields. These symptoms include vomiting, nausea, headache, and dizziness. They often described experiencing such symptoms on a number of occasions, rather than just once, coinciding with the regular spraying events on nearby plantations.

Another key finding of this research is that, even where aerial and/or ground buffer zones are established by law, such buffer zones are often not respected in practice. In relation to aerial spraying, Human Rights Watch documented four cases in the seven sites where the aerial buffer zone of 500 meters was not respected.⁶³ In relation to ground spraying, Human Rights Watch visited three of the eight states that do have buffer zones for mechanized ground spraying—Goiás, Mato Grosso and Paraná—and documented four cases of ground spraying within five meters from schools.⁶⁴

Also, the fear of reprisals from large landowners grips many rural communities exposed to pesticides. Threats or fear of retaliation were mentioned in five of the seven sites visited.⁶⁵ In the course of researching this report, seven people described threats or fears of retaliation after having mobilized against the health impacts of pesticides.⁶⁶

⁶³ Sites B, D, E, and G.

⁶⁴ Sites A, E, and two schools in Cascavel municipality, Paraná state. Site A: Human Rights Watch interviews with Camila and Gabriela, Primavera do Leste municipality (Brazil), October 30, 2017; Site E: Human Rights Watch interviews with Luciano, Talita, Danilo, Juliana, Miguel, and Adriana, Goiás state (Brazil), February 22, 2018. Two schools in Cascavel municipality, Paraná state: Human Rights Watch interviews with Rosa and Jorge, Cascavel municipality (Brazil), December 1, 2017, and Déborah, Cascavel municipality (Brazil), November 30, 2017.

⁶⁵ Sites A, C, D, E, and G.

⁶⁶ Threats against two people included in this report (Hugo Alves dos Santos and Father Romário Hastenreiter) have previously been publicly reported. Human Rights Watch interview with Hugo Alves dos Santos, Rio Verde municipality (Brazil), February 21, 2018; See also, “‘Crianças atingidas por chuva de agrotóxicos estão abandonadas’, denuncia professor,” *Rádio Brasil Atual*, July 24, 2017, <https://soundcloud.com/redebrasilatual/professor-e-ameacado-de-morte-por-reivindicar-atendimento-aos-alunos-atingidos-pela-chuva-de-veneno> (accessed May 29, 2018). Human Rights Watch telephone interview with Father Romário Hastenreiter, April 20, 2018; see also Fernanda Couzemenco, “Manifesto denuncia ameaças a lideranças mobilizadas contra agrotóxicos em Boa Esperança,” *Século Diário*, December 14, 2017, <http://seculodiario.com.br/36940/10/comissao-estadual-de-producao-organica-publica-mocao-de-apoio-aos-municipes-de-boa-esperanca> (accessed May 29, 2018). A further six people reported threats or fears of retaliation: Human Rights Watch interviews with Camila, Primavera do Leste municipality (Brazil), October 30, 2017; Déborah, Cascavel municipality (Brazil), November 30, 2017; Pedrina, Minas Gerais state (Brazil), January 27, 2018; Pedro, Santarem municipality (Brazil), February 18, 2018; Antônio, Santarem municipality (Brazil), February 19, 2018; Andressa, Bahia state (Brazil), April 25, 2018.

Site A (Mato Grosso)

Site A is a rural school in Primavera do Leste municipality in the state of Mato Grosso in the mid-west region. The school has just over 100 students, with classes for students around 15-16 years old during the day and for adults in the evening. There are plantations immediately beside the school grounds, with the closest classrooms about 15 meters from the fields. Human Rights Watch interviewed five students and teachers in the school.

Unusually for Brazil, both Mato Grosso's and Primavera do Leste's legislation establish a buffer zone for ground spraying.⁶⁷ Currently, the municipal buffer zone is 250 meters from urban zones, but there is a bill under discussion reducing it to 90 meters, the same distance established by state legislation.⁶⁸

Site A school has been subject to some enforcement action by authorities: the municipal secretary of development of industry, trade, agriculture, and environment repeatedly notified the farmer that he should comply with the legislation and issued a fine of 100,000 reais (around US\$25,000) in 2014, and the Mato Grosso state court issued an interim injunction establishing a buffer zone of 250 meters around the school and rural community in 2015.⁶⁹ However, according to interviews with teachers at Site A, spraying during the cotton harvest in mid-2017 occurred frequently close to the school, so school staff subsequently complained to the municipal environment department. Teachers at Site A told Human Rights Watch there had been no response or visit in reaction to the most recent complaint.⁷⁰

Carina is an adult woman who studies at the school in the evening. She described an incident of acute poisoning that occurred in 2017:

That night there was a strong smell when I arrived. I could taste it in my mouth. I started feeling sick, nauseous. I tried to drink water to get better, but it didn't help. I started vomiting many times, until I had thrown up all I had in my stomach and was just retching. The classes were cancelled for

⁶⁷ Mato Grosso State Decree No. 1,651 of 2013; Primavera do Leste Municipal Law 1,007 of 2007.

⁶⁸ Bill No. 810 of 2017 to Amend Primavera do Leste Municipal Law 1007 of 2007.

⁶⁹ Copies on file with Human Rights Watch.

⁷⁰ Human Rights Watch interviews with Camila and Gabriela, Primavera do Leste municipality (Brazil), October 30, 2017.

everyone and I went home. I felt sick the day after with nausea and headache. I was taking something for my headache, but it didn't help. The morning after I took milk and began to feel better but even my school uniform had the smell of pesticides.⁷¹

Site B (Mato Grosso do Sul)

Site B is located a few hours' drive from Campo Grande, the capital city of Mato Grosso do Sul state in Brazil's mid-west region. It is a community of a few hundred indigenous Guarani-Kaiowá people who live in huts and houses in a small forest around a stream.⁷² A plantation begins approximately 50 meters from the community's main hall and several houses located on the margins of the forest. The adjacent field alternates between growing soy and corn.

Human Rights Watch spoke to 11 Guarani-Kaiowá men, women, and children living in site B. They described numerous incidents of acute poisoning by pesticides in recent years from both aerial and ground spraying.⁷³ In some cases, the residents treat the symptoms of pesticide poisoning with a natural solution based on lemon juice, while in more serious cases, they described going to the local hospital (about a 45 minutes' drive away).

Jakaira is a man in his 40s who has lived in site B for 10 years. He is married and the father of three adult children. He described an acute poisoning that had occurred around October 2017:

It was early in the morning, around 8 a.m., the tractor was spraying, and I smelt it. One could see the white liquid [in the air]. Even smelling it, it goes to your brain. You feel a bitterness in the throat. You don't want to breathe poison anymore—you want to breathe another type of air—but there isn't any. Then you feel weak—you cannot get up, because the poison is very

⁷¹ Human Rights Watch interview with Carina, Primavera do Leste municipality (Brazil), October 30, 2017.

⁷² The Guarani indigenous people are divided into three groups: the Mbyá, Kaiowá and Nandeva. There are an estimated 43,000 Guarani in Brazil, and most Kaiowá and Nandeva live in the state of Mato Grosso do Sul. See Survival International, *Violations of the Rights of the Guarani of Mato Grosso do Sul state, Brazil* (London: 2010, Survival International), http://assets.survivalinternational.org/documents/207/Guarani_report_English_MARCH.pdf (accessed June 29, 2018).

⁷³ Human Rights Watch interviews with Arandu, Kerana, Arami, Karai, Jakaira, Amambay, Panambi, Mbyja, and Maitei, Campo Grande municipality (Brazil), November 21, 2017.

strong—and get a fever and headache.... You put the hand on your head and feel it throbbing. I have had this headache many times, I can't stand it. On that day, I had diarrhea and vomiting. Everyone that lives on the edges of our community felt sick. While I waited for the ambulance, I was lying on the bed and feeling weak. At the hospital I explained what I had and the cause. They gave me saline solution and medicine and I was discharged on the following day. When I was discharged from the hospital, the doctor told me to protect myself, but there isn't a way.⁷⁴

Site C (Paraná)

Site C is a rural school in Cascavel municipality in Paraná state in Brazil's south. The school has approximately 200 children, ranging from 4 to 18 years old. Human Rights Watch interviewed 16 staff and students in site C.

Teresa is a 10-year-old girl who attends a school at site C. She described an incident of spraying at the school when she was five.

The yellow tractor started spraying suddenly: we heard the noise of the machine, we could see it through the [classroom] windows. I had a strong headache, stomachache, and the feeling I would vomit. [The teacher] said: "Let's leave the classroom because the smell is too bad." We went home early. I got home with nausea, feeling sick, a strong headache. I vomited at home twice: the first time I was eating with my family. I left my plate and ran to the bathroom. I didn't eat anymore. I laid on the bed, fell asleep, and after a while I vomited again.⁷⁵

In 2015, a municipal law in Cascavel established a buffer zone around schools, health units, and rural communities prohibiting any type of spraying within 300 meters or 50 meters in case there is a barrier of trees.⁷⁶ Prior to this law, classrooms at site C were around 50 meters distant from the plantation; at the time of interview, the nearest classrooms were

⁷⁴ Human Rights Watch interview with Jakaira, Campo Grande municipality (Brazil), November 21, 2017.

⁷⁵ Human Rights Watch interview with Teresa, Cascavel municipality (Brazil), November 29, 2017.

⁷⁶ Cascavel Municipal Law No. 6,484 of 2015.

approximately 100 meters away from the plantations with trees planted in between. Interviewees at site C said that since the law's introduction, the situation has improved.⁷⁷

However, Human Rights Watch visited other schools in Cascavel municipality, including two schools where teachers and students told Human Rights Watch that there were ongoing health problems caused by pesticide spraying. At both schools, staff told Human Rights Watch that spraying has occurred close to the schools, within the buffer zone established by the municipal law.⁷⁸

Site D (Minas Gerais)

Site D is a *quilombo* (Afro-Brazilian) community of around 60 men, women and children. It is located a few hours' drive from Belo Horizonte, the capital of the state of Minas Gerais in Brazil's south-east region. Houses are simple, set beside a few mango and banana trees, and residents grow beans, pumpkins, corn, and okra at small vegetable plots. Some of the houses in site D are around 20 meters away from the adjacent sugarcane plantation.

Human Rights Watch interviewed 21 men, women, and children. Residents said airplanes often spray over the houses of the community and that spraying interrupts daily activities—such as farming, cleaning of the garden, or just playing.⁷⁹

Bernardo is a man in his 30s who was born in site D. He is married and has a young child. Bernardo described feeling particularly powerless against aerial spraying and expressed his frustration after years of spraying, formal complaints and authorities' neglect:

[Spraying causes] headache, nausea, shortness of breath, irritated eyes, skin, and nose. Spraying by airplane is worse than tractor: one can avoid tractors, can notice them from far away because of the noise. One cannot try to stop an airplane as it flies over the community. If an airplane comes, I go inside. This week, it flew over [a neighbor's] house with the [spray]

⁷⁷ Human Rights Watch interviews with Olga, Marcos, Paulo, Bianca, Roberto, Diogo, Fernando, Carolina, Larissa, Amanda, Sofia, Teresa, and Natália, Cascavel municipality (Brazil), November 27 and 28, 2017.

⁷⁸ Human Rights Watch interviews with Rosa and Jorge, Cascavel municipality (Brazil), December 1, 2017, and Déborah, Cascavel municipality (Brazil), November 30, 2017.

⁷⁹ Human Rights Watch interviews with Estevo, Bernardo, Inacio, Kiania, Pedrina, Uiara, Canciana, Manoel, Delma, Nerea, Jovana, Guadalupe, Mirelli, Serena, Fidel, Lucina, Bastian, and Gervaso, Minas Gerais state (Brazil), January 27 and 29, 2018.

duster on. One feels [pesticides] falling on the skin. Whenever there is spraying, it is like that. We have had problems with aerial spraying for around 10 years. We've registered several complaints at the [local civil] police station and military police. No one solves it—there is no justice.⁸⁰

Site E (Goiás)

Site E is a rural school a couple of hours' drive outside of Goiânia, the capital city of Goiás state in the mid-west region of Brazil. The school has some 200 students from pre-school (ages around 3 years) to middle school (around 15-16 years old). It also has some adult students. Classes are taught during the day and night. There are plantations adjoining school classrooms: in the closest direction, fields begin 5 meters from the classroom.

Human Rights Watch interviewed seven people at the site E school, including four students from 13 to 16 years old. They described frequent pesticide applications immediately adjacent to the school, leading to bouts of nausea, dizziness, vomiting, and headaches among students.⁸¹

Danilo, a 13-year-old boy and student at site E school told Human Rights Watch:

From the classroom it's possible to see them [spray] and hear the noise, both ground spraying and [from] airplanes. You can see the tractor spraying and white water coming from the big arms. They spray very close, but even if they spray a bit further away, the wind blows [the pesticides here]. [Pesticide spraying] disturbs us, and it causes nausea; it gives me a headache. I try to sit on the other side of the classroom [from the side closest to where they spray]. We have a fan [in the classroom], it helps a bit, but the smell remains. I've felt nausea, dizziness. It's bad because you want to vomit but it gets trapped in the throat. Sometimes my mother comes [to pick me up from school] and we go to the hospital.⁸²

⁸⁰ Human Rights Watch interview with Bernardo, Minas Gerais state (Brazil), January 27, 2018.

⁸¹ Human Rights Watch interviews with Luciano, Talita, Danilo, Juliana, Miguel, and Adriana, Goiás state (Brazil), February 22, 2018.

⁸² Human Rights Watch interview with Danilo, Goiás state (Brazil), February 22, 2018.

Site F (Pará)

Site F is a rural community a few hours' drive from Santarem in the state of Pará in Brazil's northern region. Site F is home to approximately 600 people who live in a small community of houses beside a highway, with large plantations adjacent to it in the other direction. The plantation extends up to people's houses, their small gardens, and a small soccer (football) field. The fields end only 5 meters from the well the community uses for drinking water.

Human Rights Watch interviewed eight residents of site F who told Human Rights Watch that pesticides affected their health and, in the case of small-scale farmers, the viability of their crops.⁸³ A community member who organized a petition to the state environment authorities to reduce nearby pesticide spraying said that the farmer who owned the surrounding plantation had threatened him one day by making the gesture of a gun as they passed in public. He reported the threats to the civil police, but to his knowledge, police didn't take any step to investigate them.⁸⁴ According to another local resident: "We are concerned about the pesticide spraying but we are also concerned about being threatened, so we need not talk about it too much. That's what we face here."⁸⁵

Eduarda is a woman in her 20s who lives in a house located approximately 100 meters from the edge of a soy field in site F. When interviewed by Human Rights Watch, Eduarda was expecting to give birth to her first child within a few weeks.

Last month I was at home, doing housework. It was a terrible smell, very strong, like something rotten and chemical. I felt ill and with nausea and headache. I vomited a lot, once I started I couldn't stop. I had to call my husband for help. I am pregnant and my main concern was for my son, I was worried it might affect his health. It's my first pregnancy, I hadn't vomited before or after this incident, [I was ill] from the pesticides. On the drive to the hospital we stopped about 3 times [for me] to vomit. At the hospital, they gave me some saline solution and something for a headache and

⁸³ Human Rights Watch interviews with Pedro, Vicente, Alice, Ana, Eduarda, Bruno, Antônio, and Verônica, Santarem municipality (Brazil), February 18 and 19, 2018.

⁸⁴ Human Rights Watch interview with Pedro, Santarem municipality (Brazil), February 18, 2018.

⁸⁵ Human Rights Watch interview with Antônio, Santarem municipality (Brazil), February 19, 2018.

nausea. I said it was because of pesticides, but they ignored this. They treated it like a virus, it wasn't registered as an intoxication.⁸⁶

Site G (Bahia)

Site G is a rural community in the south of Bahia, in Brazil's northeast region. The area is dominated by plantations of eucalyptus trees. Approximately 100 families live in site G in a community centered around a small school and health unit. Houses and small vegetable plots belonging to the residents are interspersed with eucalyptus tree plantations; in some cases, houses are 20 meters from the plantations.

Human Rights Watch interviewed five residents. Community members said that ground spraying is more common, but that aerial spraying also occurs. Local residents told Human Rights Watch that they had experienced symptoms such as nausea, headache, diarrhea, burning and watering eyes, and numb lips following pesticide applications.⁸⁷

Marelaine, a woman in her 20s who is a school teacher and small-scale farmer described an incident in 2015, when she was heading to school:

I was still close to my house when the airplane sprayed over the eucalyptus trees and the wind blew the pesticides towards me. I got wet and had to go back home and take another shower. Arriving at school, a headache began, and I felt my nose burning, itching, tingling. The airplane was spraying beside the school and the wind blowing to the school. One couldn't smell it, but could feel the drift entering through the window. The children, between 4 and 7 years old, were complaining that their gums and eyes were burning. I released them around 9 a.m. and sent a message to the parents saying that we wouldn't have classes while they were spraying.⁸⁸

⁸⁶ Human Rights Watch interview with Eduarda, Santarem municipality (Brazil), February 19, 2018.

⁸⁷ Human Rights Watch interviews with Gustavo, Marelaine, Andressa, and Joaquim, Bahia state (Brazil), April 25 and 27, 2018.

⁸⁸ Human Rights Watch interview with Marelaine, Bahia state (Brazil), April 25, 2018.

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“You Don’t Want to Breathe Poison Anymore”

The Failing Response to Pesticide Drift in Brazil’s Rural Communities

Throughout rural Brazil, ordinary people face toxic exposures when pesticide spray drifts off target crops during application, or when pesticides vaporize and drift to adjacent areas in the days after spraying.

“*You Don’t Want to Breathe Poison Anymore*” documents cases of acute poisoning from pesticide drift across seven sites, including farming communities, indigenous communities, quilombos (Afro-Brazilian communities) and rural schools. People commonly experience vomiting, nausea, headache, and dizziness.

Brazil’s response to pesticide drift is failing. While a Ministry of Agriculture regulation prohibits aerial spraying within 500 meters of inhabited sites, this buffer zone is often ignored in practice. There is no corresponding national regulation delimiting ground spraying.

There are indications that government data grossly understates the prevalence of pesticide poisonings. The national monitoring system for pesticide residues in drinking water and food is also weak.

Acute pesticide poisoning and chronic exposure are invisible to Brazil’s broader public and policy makers. One of the most insidious reasons is a fear of reprisals from large landowners that grips many rural communities. While researching this report, people described threats or fears of retaliation after having mobilized against the health impacts of pesticides.

Brazil urgently needs to introduce measures to limit pesticide exposure harmful to human health. The Brazilian authorities should undertake a thorough and time-bound review of the impacts of the current approach to pesticides. While undertaking this review, Brazil should impose a moratorium on aerial spraying and impose and enforce an immediate prohibition on ground spraying near sensitive sites.



All photos

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Irupe and Pinon, both in their 40s, live in a community a few hours’ drive from Campo Grande, the capital city of Mato Grosso do Sul in mid-west Brazil. They told Human Rights Watch that the most recent incident of poisoning was in early 2018, when they felt spray from a tractor spraying pesticides in the nearby plantation. Among her symptoms, Irupe experienced dizziness, headache, and vomiting.