

Public Health Crisis and Mobility Restrictions: What Impact Did the Ebola Epidemic Have on Women Engaged in Small-Scale Cross-Border Trade in Goma and Bukavu?

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Abstract: This study examines the effects of restrictive measures implemented during the Ebola outbreak on the activities of women engaged in informal cross-border trade between the Democratic Republic of the Congo (DRC) and Rwanda within the African Great Lakes region. A survey was conducted among 338 women cross-border traders in Goma and Bukavu. The findings reveal that 59.8% of the respondents managed to continue their business activities under difficult conditions, while 66% experienced a significant decline in their monthly profits, as confirmed by a Chi-square test ($p < 0.001$). Border closures also disrupted supply chains, increased purchase prices, and raised transaction costs. To sustain their businesses, 66.3% of the women adopted a collective procurement (group purchasing) system, thereby confirming the hypothesis that collective action constitutes an effective resilience strategy. Despite this adaptive response, the traders faced delivery delays, reduced control over their goods, and limited institutional support. The study concludes that regional mechanisms capable of balancing public health protection with the continuity of cross-border trade are essential to strengthening the economic resilience of women traders in the African Great Lakes region.

Keywords: *Mobility, Border, Health crisis, Ebola virus, Cross-border trade.*

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Introduction

Small-scale cross-border trade plays a crucial role in food security, the daily livelihoods of thousands of households, and peaceful coexistence among communities in the Great Lakes region. The border between the Democratic Republic of the Congo (DRC) and Rwanda is among the busiest in Africa, with women accounting for a substantial share of cross-border trading activities (iPeace Report, 2020). In late May 2026, this trade was directly affected by the resurgence of Ebola virus disease and the restrictive measures introduced in response to the outbreak. These measures, particularly those affecting population mobility and cross-border movement, significantly disrupted the activities of women engaged in small-scale cross-border trade in Goma and Bukavu.

This interplay between epidemics and the tightening of border controls is not new. As Bourdelais (2008) and Moullé and Duhamel (2010) point out, epidemics disregard borders, while societies seek to protect themselves by strengthening border-control measures. Two historical precedents clearly illustrate this barrier effect. The first dates back to the 1990s, when the outbreak of bovine spongiform encephalopathy (BSE), commonly known as “mad cow disease,” in the United Kingdom (Peretti-Watel, 2001)

prompted other member states of the European Community to suspend imports of products derived from British livestock. The second, more complex case concerns the 2014 Ebola outbreak in West Africa, during which Guinea, Liberia, and Sierra Leone were subjected to a triple air, maritime, and land embargo, together with travel restrictions imposed on their nationals. This quarantine of the so-called Ebola triangle did not, however, prevent the pathogen from spreading within the subregion and beyond, although the number of exported cases remained limited (Robinson, 2017).

In a world characterized by high mobility, economic interdependence, and extensive informational interconnectedness, the magnitude of such threats is amplified. Traditional border-control and containment measures are no longer sufficient to protect societies from the cross-border spread of diseases or disease vectors (WHO, 2020). With information circulating in real time, panic can spread almost as rapidly as the virus itself, while economic and commercial activities experience the repercussions of public health crises far beyond the geographical boundaries of epidemic hotspots.

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In response to these constraints, women engaged in small-scale cross-border trade in Bukavu and Goma developed adaptive strategies based on collective purchasing and selling arrangements. This system has notable strengths, including inclusiveness, low barriers to entry, the strengthening of social networks, solidarity among members, and the sharing of financial gains. However, it also exhibits structural weaknesses, such as its informal nature, the limited capital available to small-scale traders, and weak enforcement of established rules (Biningo, M., 2024). Nevertheless, these arrangements enabled many women to sustain their economic activities by having goods delivered locally and continuing to sell them despite the closure of the border.

It is against this backdrop that the present study is situated. It aims to assess the impact of restrictive measures, particularly border closure, on the economic activities of women engaged in small-scale cross-border trade and on the livelihoods and survival of their households during the resurgence of Ebola virus disease in North and South Kivu.

The contribution of this study to the existing body of knowledge is twofold. First, it addresses an empirical gap by examining the effects of restrictive public health measures on small-scale cross-border trade in a doubly vulnerable context characterized by both a recurrent public health crisis and a security crisis. Second, it contributes to the existing literature by proposing an analytical framework that explores the interplay between health security and economic security, while taking into account the specific realities of informal cross-border economies in the African Great Lakes region.

The present study is organized into five sections. The first section reviews the relevant literature; the second describes the methodology; the third presents the findings; the fourth discusses the results; and the fifth addresses the study's implications and directions for future research.

Literature Review

Borders, Ebola Virus Disease, and Restrictive Measures

A border, as a geographical and political construct, cannot be reduced to its linear dimension alone. Rather, it structures a particular region on both sides of an international boundary, the spatial extent of which varies according to the intensity and scope of cross-border relations. As Machado (2005) points out, the etymology of the term refers to what is “at the front,” while the Latin concept *limes* contributed to the modern conception of the state as a bounded territorial unit. This distinction has been further refined in the English-language literature through the concepts of *border* (the adjacent area), *boundary* (the line itself), and *borderland* (the lived space extending across both sides) (Prescott, 1987; Rumley & Minghi, 1991). This perspective is echoed by Foucher (2007), who conceptualizes the border simultaneously as a dividing line and a connecting seam.

It is precisely within these highly porous borderlands of eastern DRC that Ebola virus disease spread. Ebola virus, together with Marburg virus, belongs to the *Filoviridae* family. While classical virology distinguishes five Ebola virus species whose pathogenicity varies from 80–90% for Zaire ebolavirus, first identified in 1976 in the DRC, to approximately 25% for Bundibugyo ebolavirus, identified in Uganda in 2007 (Gasquet-Blanchard, 2016; Feldmann & Geisbert, 2011), the latter is a rare species for which, to date, neither an approved vaccine nor an

approved treatment is available. It was responsible for the seventeenth Ebola outbreak, declared by the WHO a Public Health Emergency of International Concern on 17 May 2026. As Ba (2026, IRIS) points out, this resurgence is affecting a region devastated by conflict and destabilized by the restructuring of U.S. aid, where the public health crisis overlaps with a pre-existing humanitarian and security crisis linked to the proliferation of armed groups.

Faced with this cross-border risk, the response through unilateral restrictive measures namely, the suspension of flights between Uganda and the DRC and the closure of the Rwandan border with Goma reflects, according to the literature on epidemic governance (Kodish et al., 2019; WHO, 2023), a conventional but potentially counterproductive response. While borders may be conceived as barriers, viruses circulate throughout borderlands through social, economic, and displacement-related mobility, making border closures both politically contentious and epidemiologically limited in effectiveness.

Ebola Response in the Context of Political Instability

The response to the 2026 Ebola outbreak caused by the Bundibugyo strain builds on a body of research that has established the structural entanglement between public health crises and political instability in eastern DRC. Wells et al. (2019) and Kraemer et al. (2020) demonstrated that armed conflict can alter the epidemiological trajectory by delaying case isolation and reducing the effectiveness of vaccination efforts. Villa (2022) and a report by the Center on International Cooperation (2019) showed that violence against Ebola response efforts cannot be reduced to mere community rumors, but rather involves organized violence perpetrated by actors who exploit the so-called “Ebola business,” confirming that Ebola has become an integral part of the conflict dynamics. This body of literature is further extended by Diarra et al. (2023), who emphasize that no response can succeed without building trust with affected communities.

Within this context, as Ba (IRIS, 2026) argues, epidemics do not recognize artificial borders and tend to affect the most vulnerable populations even more severely in contexts of extreme border porosity. According to the WHO, imported cases from Ituri, the current epicenter of the outbreak, spread to North Kivu and Kampala, Uganda, where two travelers returning from the DRC tested positive, one of whom subsequently died. Meanwhile, a case was reported in South Kivu in May 2026, involving an individual who had arrived from Kisangani, Tshopo Province.

This cross-border dynamic is accompanied, as was the case in 2018–2020, by unilateral measures that further strain already highly tense bilateral relations. Uganda suspended flights and transport links with the DRC on 21 May 2026, while Rwanda closed its borders with Goma and Bukavu, contrary to recommendations from the East African Community (EAC), which called for strengthened surveillance rather than border closures. The progression of the outbreak in areas under the control of the M23/AFC, with Goma captured in late January 2025 and Bukavu falling in February 2025, has turned public health into an additional arena of rivalry between Kinshasa and Kigali. Cut off from Kinshasa, the M23 has emerged as a de facto public health actor, reportedly establishing a parallel response with Rwanda's support in terms of medical supplies and specialists (Reuters, 2026). This illustrates the territorial fragmentation of the epidemic

response and the risk of regional escalation, as previously highlighted by Hassen (ISS Africa, 2026).

Effects of Restrictive Measures on Small-Scale Cross-Border Trade

Small-scale cross-border trade in the Great Lakes region constitutes not only an essential source of income but also a critical safety net for the resilience of borderland households, as demonstrated by Brenton et al. (2011) and Titeca and Kimanuka (2012) in the Goma/Gisenyi border area. For vulnerable populations, such trade provides access to essential goods and services and helps them avoid extreme poverty in a context of recurrent crises. However, the Bundibugyo Ebola outbreak that emerged in May 2026 dealt a severe blow to cross-border trade, as occurred during the 2014–2016 Ebola outbreak in West Africa (World Bank, 2014; Bish et al., 2016), following restrictions imposed on the movement of people, goods, and services.

These measures disrupted the traditional mechanisms of a trading system that had been established for several decades (Little, 2007; Raeymaekers, 2013). The literature on border closures in response to public health crises identifies three converging effects that are also observed in the field. First, a gender and income effect: the inability of women, who account for more than 70% of small-scale cross-border traders according to Brenton, Gamberoni, and Sear (2013) and IOM (2022), to physically source goods from Rwanda resulted in declining profits and reduced capacity to meet household needs in a context already affected by war. A similar phenomenon was documented during the COVID-19 pandemic by UNCTAD (2021) and COMESA (2020).

Second, a displacement or circumvention effect: as demonstrated by Bensassi, Jarreau, and Mitaritonna (2019) and Golub (2015), the closure of official border crossings does not eliminate trade; rather, it displaces it. Our observations at the Bukavu/Rusizi and Goma/Rubavu border crossings confirm a shift toward uncontrolled crossing points, commonly referred to as *panya routes*. This creates a public health paradox, as such displacement may increase the risk of disease transmission, a concern already highlighted by Kodish et al. (2019) in the context of Ebola.

Third, an organizational adaptation effect: the pandemic encouraged collective arrangements, which had already been described by Morris and Saul (2000) as a survival strategy. The constraint of limiting individual cross-border movements promoted the pooling of resources, whereby a small number of representatives undertook purchasing and selling activities on behalf of the group. Ultimately, as was the case in many other sectors, small-scale cross-border trade in the Great Lakes Region was severely affected, with one of its main consequences being a substantial increase in costs for populations among the world's most vulnerable and heavily dependent on trade for their livelihoods (World Bank, 2020).

Theoretical Development and Hypotheses

This study draws on three complementary theoretical strands to explain the effects of restrictive measures on small-scale cross-border trade in contexts characterized by epidemics and armed conflict.

a) Borderland Theory and the Border as a Resource

First, we draw on critical border studies, which move beyond the Westphalian conception of the *boundary* as a mere line

of sovereignty (Machado, 2005; Prescott, 1987). Building on Martinez (1994) and Baud and Van Schendel (1997), we conceptualize the border not as a barrier, but as a resource and a social space in its own right the *borderland*. From this perspective, the DRC–Rwanda border constitutes a structural economic opportunity for borderland households. Its closure does not eliminate interaction; rather, it reconfigures it. This theoretical perspective helps explain the displacement of cross-border activities toward uncontrolled crossing points.

b) The Theory of Health Securitization and Fragmented Health Governance

To analyze the response to the outbreak, we draw on the Copenhagen School of securitization theory (Buzan, Wæver, & de Wilde, 1998; Elbe, 2010). By declaring Ebola a Public Health Emergency of International Concern (PHEIC) on 17 May 2026, the WHO shifted Ebola from the realm of public health to that of existential security, thereby legitimizing exceptional measures such as border closures. Fassin (2006) and Lakoff (2017) show that such securitization generates distinct political effects, particularly competition among different sources of health-related legitimacy. In eastern DRC, where the state has lost its territorial monopoly since January–February 2025 following the capture of Goma and Bukavu, we observe what Ba (2026) and Villa (2022) describe as dual health governance, in which the M23/AFC has emerged as a *de facto* public health actor seeking to assert its state-like authority (Reuters, 2026).

c) The Theory of the Informal Economy and Resilience through Collective Action

Finally, to understand how women traders adapted to the restrictions, we combine the neo-institutionalist approach to transaction costs (Williamson, 1985; North, 1990), as applied to informal trade by Golub (2015), with the theory of the informal economy as a norm rather than an anomaly (Hart, 1973; De Soto, 1989). Border closures sharply increased formal transaction costs, making formal channels economically unviable. A rational response was therefore to adopt collective strategies. The theory of organizational resilience (Holling, 1973; Béné et al., 2012), together with research on women's social capital (Brenton et al., 2011; Morris & Saul, 2000), helps explain the shift from individual strategies toward collective purchasing through associations and cooperatives as a mechanism for pooling risks and costs.

Based on these theoretical perspectives, two research hypotheses are formulated:

- **H1:** *Ebola Bundibugyo-related restrictive measures, particularly the closure of the Bukavu/Rusizi and Goma/Rubavu border crossings since May 2026, have a negative and statistically significant effect on the profits of women engaged in small-scale cross-border trade.*
- **H2:** *In response to restrictive measures, collective trading arrangements constitute an adaptive strategy that enables women engaged in small-scale cross-border trade to sustain their economic activities.*

Methodology

Data collection was conducted in two complementary phases in the provinces of North and South Kivu, covering the Ruzizi I and Ruzizi II border crossings in Bukavu, the Petite Barrière and Grande Barrière border crossings in Goma, as well as

the cross-border markets of Kahembe and Elakat. The first phase was exploratory and focused on pre-testing the questionnaire and defining the target population. The second phase consisted of the main survey, conducted from 13 to 17 July 2026, shortly after the reopening of the border between the Democratic Republic of the Congo (DRC) and Rwanda.

A team of ten enumerators was deployed in the field, including seven in Bukavu and three in Goma. The enumerators conducted individual interviews at the various markets and in areas located near the border crossing points.

Due to the occupation of the cities of Goma and Bukavu by the AFC/M23 since early 2025, which rendered the Division of External Trade non-operational, and in the absence of reliable official statistics, probability sampling was not feasible. We therefore adopted a non-probability snowball sampling approach. After the objectives of the study had been clearly explained, only women who provided informed and voluntary consent, after being informed about anonymity and the intended use of the data, were interviewed. This process resulted in a total sample of 338 women in Goma and Bukavu.

The sampling process was conducted progressively until the saturation threshold was reached. In accordance with Mayer et al. (2000), data triangulation was ensured by cross-referencing primary data with secondary sources, including materials from the libraries of the Official University of Bukavu (UOB, DRC) and the Catholic University of Bukavu (UCB, DRC), as well as reports from specialized NGOs (Alert International, iPeace DRC) and regional and international institutions (World Bank, WHO,

COMESA, among others). Data were collected using Kobocollect and subsequently analyzed using SPSS Statistics, version 27.0.

Results

Characteristics of the Respondents

Before the closure of the border between Rwanda and the DRC, 46.2% of the women crossed the border once or twice a week to purchase goods in Rwanda. Among the surveyed women engaged in small-scale cross-border trade, 28.7% traded in vegetables, followed by those involved in other activities, including the sale of tubers, transport services, catering, and other products. These were followed by women trading in fruits (16.9%), flour (12.1%), fish (8.33%), milk (7.1%), and poultry (3.3%).

Of all the women surveyed, 76.9% were beneficiaries of various cross-border trade projects, including *Tuinuwe Byashara Mupakani*, *Uhaki Bila Mipaka*, *PIFCGL*, and *Mupaka Shamba Letu*, implemented by different NGOs, including iPeace and Alert International. The remaining 23.1% were not affiliated with any project. Furthermore, 82.5% of the women had between four and eight years of cumulative experience in small-scale cross-border trade.

Impact of Border Closure on Cross-Border Trading Activities

This subsection presents the main findings of the study, focusing on the impact of border closure on women's trading activities, supply chains, business continuity strategies, and related dimensions.

Continuity of Business Activities During the Border Closure Period

Table 1. Respondents' Views on Business Continuity During the Border Closure

Response	Frequency	Percentage	Valid Percentage	Cumulative Percentage
Yes, but with difficulty	202	59.8%	59.8%	59.8%
Yes, normally	120	35.5%	35.5%	95.3%
No, complete cessation of activities	16	4.7%	4.7%	100.0%
Total	338	100.0%	100.0%	—

Source: Authors' survey results, July 2026.

The table shows that 59.8% of the respondents continued their small-scale trading activities, albeit with considerable difficulty, during the border closure. This finding illustrates Foucher's conceptualization of the border as a "seam": even when officially closed, the border remains porous due to economic necessity. The 4.7% who reported a complete cessation of their

activities nevertheless represent 16 households that were pushed into extreme vulnerability. By contrast, the 35.5% who reported continuing their activities normally were primarily women who had established strong and reliable relationships with their suppliers, enabling them to maintain access to goods despite the restrictions.

Profit Trends Following Border Closure

Table 2. Border Closure and Changes in Monthly Profit

Estimated loss in average monthly profit during the closure	No decrease	Decrease	Total
No decrease	115 (34.0%)	0 (0.0%)	115 (34.0%)
Less than 25%	0 (0.0%)	90 (26.6%)	90 (26.6%)
25–50%	0 (0.0%)	66 (19.5%)	66 (19.5%)
51–75%	0 (0.0%)	31 (9.2%)	31 (9.2%)

76–100%	0 (0.0%)	15 (4.4%)	15 (4.4%)
More than 100%	0 (0.0%)	21 (6.2%)	21 (6.2%)
Total	115 (34.0%)	223 (66.0%)	338 (100.0%)

Source: Authors' survey results, July 2026.

Table 2 shows that 223 out of 338 women (66.0%) reported a decline in their monthly profits during the period of border closure, compared with only 34.0% who reported no decrease. Among the affected women, most reported losses ranging from less than 25% (26.6%) to 50% (19.5%), while some experienced very substantial losses, including losses exceeding their usual profit levels (6.2%).

This situation reflects a direct economic shock resulting from the restrictive measures. The closure of border crossing points limited access to Rwandan supply markets, increased transaction costs, and reduced the volume of goods traded. Women engaged in small-scale cross-border trade were therefore confronted with a substantial reduction in their profit margins.

Table 3. Chi-Square Tests

Test	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	338.000 ^a	5	< 0.001
Likelihood Ratio	433.446	5	< 0.001
Valid Cases	338		

Note: ^a 0 cells (0.0%) have an expected count less than 5. The minimum expected count is 5.10.

Source: Authors' survey results, July 2026.

Table 3a. Symmetric Measures

Measure	Value
Cramer's V	1.000
Valid N	338

Source: Authors' survey results, July 2026.

The Chi-square test reveals a highly significant association between border closure and the decline in monthly profits ($\chi^2 = 338.000$; $p < 0.001$). Furthermore, Cramer's V of 1.000 indicates an extremely strong association between the two variables. The results show that 66.0% of the women experienced a decline in their profits during the period of border closure. Therefore, hypothesis H1 is supported: Ebola-related restrictive measures had a

statistically significant negative effect on the profits of women engaged in cross-border trade.

Inventory Management During the Border Closure

According to the surveyed women engaged in cross-border trade, inventory management became a major concern during the temporary closure of the border, a measure adopted by the authorities to limit the spread of Ebola virus disease.

Table 4. Inventory Management During the Border Closure

Inventory management outcome	Frequency	Percentage	Valid Percentage	Cumulative Percentage
No stock-outs	113	33.4%	33.4%	33.4%
Stock-outs	104	30.8%	30.8%	64.2%
Sold at a loss	96	28.4%	28.4%	92.6%
Expired products	25	7.4%	7.4%	100.0%
Total	338	100.0%	100.0%	

Source: Authors' survey results, July 2026.

The table shows that 33.4% of the respondents did not experience stock-outs despite the border closure. This can be explained by their use of collective purchasing and group-based procurement arrangements, which enabled them to continue sourcing goods from Rwanda.

Supply Chain

Identification of Local Suppliers

Table 5. Apart from Rwandan Suppliers, Did You Identify Other Local Suppliers During the Border Closure?

Response	Frequency	Percentage	Valid Percentage	Cumulative Percentage
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No	160	47.3%	47.3%	47.3%
Yes, with difficulty	110	32.5%	32.5%	79.9%
Yes, easily	68	20.1%	20.1%	100.0%
Total	338	100.0%	100.0%	

Source: Authors' survey results, July 2026.

The table shows that 47.3% of the women remained dependent exclusively on their Rwandan suppliers. This provides empirical support for the border-as-resource theory: there were no immediate local alternatives available within the borderlands of eastern DRC. This structural dependence, already highlighted by

Little and Raeymaekers, made the border closure particularly punitive for these traders. The 32.5% who managed to identify alternative suppliers only with difficulty illustrate the high information-search costs associated with finding new sources of supply in a crisis context.

B. Trends in Purchase Prices During the Border Closure

Table 6. Main Products Traded and Changes in Purchase Prices

Main product traded	Purchase price increased	Purchase price decreased	Purchase price remained stable	Total
Other products	57 (16.9%)	8 (2.4%)	15 (4.4%)	80 (23.7%)
Flour	9 (2.7%)	8 (2.4%)	24 (7.1%)	41 (12.1%)
Fruits	36 (10.7%)	13 (3.8%)	8 (2.4%)	57 (16.9%)
Milk	6 (1.8%)	8 (2.4%)	10 (3.0%)	24 (7.1%)
Vegetables	46 (13.6%)	38 (11.2%)	13 (3.8%)	97 (28.7%)
Fish	11 (3.3%)	10 (3.0%)	7 (2.1%)	28 (8.3%)
Poultry	3 (0.9%)	2 (0.6%)	6 (1.8%)	11 (3.3%)
Total	168 (49.7%)	87 (25.7%)	83 (24.6%)	338 (100.0%)

Source: Authors' survey results, July 2026.

A total of 49.7% of the women reported facing higher purchase prices when sourcing goods through collective purchasing arrangements from Rwanda. Vegetable and fruit traders were the most affected, accounting for 13.6% and 10.7%, respectively. This finding is consistent with the price-increase effect documented by the World Bank among vulnerable

populations. Rwandan suppliers, operating under a temporary monopoly position, appear to have passed the additional risks and informal costs on to buyers through higher prices. This illustrates a potential unintended consequence of securitization: efforts to restrict the movement of goods can increase the prices of essential commodities on both sides of the border.

Table 6a. Chi-Square Test of Independence

Test	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	50.924	12	< 0.001

Source: Authors' survey results, July 2026.

The change in purchase prices varies significantly according to the type of product traded ($\chi^2 = 50.924$; $p < 0.001$). Women trading in vegetables and fruits appear to be the most affected by rising purchase prices.

Participation in Collective Purchasing Arrangements

Table 7. Participation in Collective Purchasing Arrangements with Other Women Traders to Source Goods from Rwanda

Response	Frequency	Percentage	Valid Percentage	Cumulative Percentage
Yes, through an association	148	43.8%	43.8%	43.8%
No	114	33.7%	33.7%	77.5%
Yes, through a transporter	76	22.5%	22.5%	100.0%
Total	338	100.0%	100.0%	

Source: Authors' survey results, July 2026.

These findings provide empirical support for the second hypothesis (H2). Overall, 66.3% of the respondents pooled their efforts (43.8% + 22.5%) by using collective purchasing arrangements, either through an association or through a Rwandan transporter, to source goods from Rwanda. This shift from individual strategies to collective action represents a key mechanism of organizational resilience, consistent with the theoretical perspectives developed by Holling (1973) and Béné et al. (2012). Collective action enabled women traders to pool resources, share risks, and maintain access to supply networks despite the border restrictions.

Statistical Test of Hypothesis H2

Hypothesis H2 states that collective purchasing arrangements constitute an adaptive strategy enabling women engaged in small-scale cross-border trade to maintain the continuity of their business activities.

Based on the results presented in Table 7, a binomial test is conducted by comparing the observed proportion of respondents using collective purchasing arrangements (66.3%) with a theoretical proportion of 50%.

Table 7a. Results of the Binomial Test

Variable	Category	N	Observed Proportion
Participation in collective purchasing arrangements (through an association or transporter)	Yes	224	0.663
Participation in collective purchasing arrangements (through an association or transporter)	No	114	0.337
Total	—	338	1.000

Source: Authors' survey results, July 2026.

Table 7b. Binomial Test

Test	Value
Test Proportion	0.50
Exact Significance (2-sided)	< 0.001

Source: Authors' survey results, July 2026.

The results of the binomial test show that the proportion of women who participated in collective purchasing arrangements (66.3%) was significantly higher than the theoretical proportion of 50% ($p < 0.001$). The use of collective purchasing arrangements therefore emerged as the dominant strategy adopted by women engaged in small-scale cross-border trade during the period of

border closure. These findings confirm that collective action constituted an effective adaptive mechanism in response to the constraints imposed by the health-related restrictive measures. Hypothesis H2 is therefore supported.

Table 8. Main Disadvantages of Collective Purchasing Arrangements

Main disadvantage	Frequency	Percentage	Valid Percentage	Cumulative Percentage
None	170	50.3%	50.3%	50.3%
Delivery delays	51	15.1%	15.1%	65.4%
Loss of control over goods	48	14.2%	14.2%	79.6%
Delivery not consistent with the goods ordered	31	9.2%	9.2%	88.8%
Conflicts with suppliers	24	7.1%	7.1%	95.9%
Misappropriation of funds	11	3.3%	3.3%	99.1%
Conflicts among group members	3	0.9%	0.9%	100.0%
Total	338	100.0%	100.0%	—

Source: Authors' survey results, July 2026.

Although 50.3% of respondents reported no disadvantages, suggesting that the system functioned effectively for a substantial proportion of women, the remaining 49.7% reveal the structural limitations of informal arrangements. Specifically, 15.1% of the women reported delays in the delivery of goods, 14.2% mentioned losing control over their merchandise, and 9.2% received goods

that did not conform to their orders. These findings are consistent with the predictions of neo-institutional theory: when face-to-face transactions are replaced by delegation to third parties in the absence of formal contractual arrangements, risks of opportunistic behaviour and monitoring costs tend to increase.

Requirements for Cross-Border Movement of Goods

Table 9. Requirements for Moving Goods Across the Border During the Border Closure

Requirement	Frequency	Percentage	Valid Percentage	Cumulative Percentage
Payment of additional fees to move goods across the border	129	38.2%	38.2%	38.2%
Officially obtaining a pass while goods continued to cross as before	112	33.1%	33.1%	71.3%
Obtaining special authorization	97	28.7%	28.7%	100.0%
Total	338	100.0%	100.0%	

Source: Authors' survey results, July 2026.

The table shows that 38.2% of the women reported paying additional fees to move their goods across the border. This can be explained by the fact that, during the border closure, flour was taxed on a per-sack basis rather than per minibus or small truck, thereby increasing the effective cost of cross-border trade. This

represents a shift from economies of scale to a penalty-based cost structure. The finding is consistent with the analysis of Ba and Villa regarding the so-called “Ebola business,” whereby a public health crisis can create opportunities for rent-seeking among actors operating in border areas.

Table 10. Other Strategies Used to Move Goods Across the Border

Strategy	Frequency	Percentage	Valid Percentage	Cumulative Percentage
Other strategies	279	82.5%	82.5%	82.5%
Temporary suspension of activities	33	9.8%	9.8%	92.3%
Use of unofficial crossing routes	26	7.7%	7.7%	100.0%
Total	338	100.0%	100.0%	—

Source: Authors' survey results, July 2026.

The table shows that only 7.7% of the women reported using unofficial crossing roads, commonly referred to as *panya roads*, such as crossing the Ruzizi River by canoe to transport goods. This relatively low level of reliance on unofficial routes can be explained by the prevailing security context in 2025–2026. Unlike the situations documented by Bensassi et al., in Goma and Bukavu, under AFC/M23 control, *panya roads* represented not

only a public health risk, as noted by Kodish et al., but also a potentially life-threatening security risk. Consequently, the displacement of cross-border trade did not primarily occur through remote or unofficial routes; instead, it was largely redirected toward collective purchasing arrangements organized through associations.

Table 11. Causes of Deterioration in the Quality of Goods

Cause of deterioration	Strong deterioration	No change	Slight deterioration	Improvement	Total
Goods changed during transit	0 (0.0%)	0 (0.0%)	9 (2.7%)	0 (0.0%)	9 (2.7%)
Longer delivery times	2 (0.6%)	0 (0.0%)	40 (11.8%)	0 (0.0%)	42 (12.4%)
Poor transportation conditions	9 (2.7%)	0 (0.0%)	46 (13.6%)	0 (0.0%)	55 (16.3%)
Receipt of another customer's parcel	2 (0.6%)	0 (0.0%)	15 (4.4%)	0 (0.0%)	17 (5.0%)
Total	13 (3.8%)	202 (59.8%)	110 (32.5%)	13 (3.8%)	338 (100.0%)

Source: Authors' survey results, July 2026.

The table shows that 59.8% of the women received goods that were identical to those they had ordered, while 32.5% reported that the goods had undergone slight deterioration. Overall, collective purchasing arrangements helped preserve the quality of

the goods, which explains why women traders viewed this strategy positively despite its limitations. However, the main causes of deterioration, particularly poor transportation conditions and longer delivery times, can be directly attributed to the border closure and the resulting disruption of established supply chains.

Among the main difficulties encountered were:

Table 12. Main Difficulties Encountered During the Border Closure

Main difficulty	Frequency	Percentage	Valid Percentage	Cumulative Percentage
Reduced income	158	46.7%	46.7%	46.7%
Loss of customers	130	38.5%	38.5%	85.2%
Receipt of non-conforming goods	34	10.1%	10.1%	95.3%
Misunderstandings with border authorities	16	4.7%	4.7%	100.0%
Total	338	100.0%	100.0%	

Source: Authors' survey results, July 2026.

A total of 46.7% of the women reported a decrease in income, while 38.5% reported losing customers. This reflects the cumulative effect described by COMESA: border closure first disrupts access to supplies and subsequently reduces the customer base as consumers turn to alternative sources. Customer loss is more detrimental than a temporary decline in income because it erodes the relational capital built over four to eight years, and in some cases even longer, through women's sustained engagement in small-scale cross-border trade.

Assistance and Support

To resume and rebuild their economic activities, women traders require various forms of assistance and support. Tables 13 and 14 present, respectively, the types of assistance that women received during the period of border closure and the types of support they identified as necessary following Rwanda's reopening of the border with the Democratic Republic of the Congo, after the health authorities considered the outbreak to be under control.

Table 13. External Assistance Received

Source of assistance	Frequency	Percentage	Valid Percentage	Cumulative Percentage
Other sources	252	74.6%	74.6%	74.6%
Women's associations	68	20.1%	20.1%	94.7%
Family	10	3.0%	3.0%	97.6%
NGOs	5	1.5%	1.5%	99.1%
Local authorities	3	0.9%	0.9%	100.0%
Total	338	100.0%	100.0%	

Source: Authors' survey results, July 2026.

This is perhaps the most striking indicator of institutional abandonment. As many as 74.6% of the women reported receiving no external assistance, while only 20.1% received support through their own associations and just 1.5% received assistance from NGOs. In a context of dual health governance, in which Kinshasa has been disconnected from Goma and Bukavu since January 2025,

the state has been largely absent, while international assistance has been destabilized by the restructuring of U.S. aid, as noted by Ba (2026). Women have therefore relied primarily on self-organization and mutual support to sustain their livelihoods, a finding consistent with the conclusions of Diarra et al. (2023).

Table 14. Types of Support Needed

Type of support	Frequency	Percentage	Valid Percentage	Cumulative Percentage
Other forms of support	199	58.9%	58.9%	58.9%
Coaching and mentoring	104	30.8%	30.8%	89.6%
Connection to cross-border business opportunities through networking	35	10.4%	10.4%	100.0%
Total	338	100.0%	100.0%	

Source: Authors' survey results, July 2026.

Contrary to expectations of receiving financial assistance, 30.8% of the women expressed a need for coaching and mentoring, while 10.4% requested networking opportunities. This reflects a demand for capacity building rather than dependency on assistance. Following a crisis that increased uncertainty and transaction costs, women traders need enhanced skills and capabilities to operate effectively within collective purchasing arrangements and strengthen the performance of their businesses.

Discussion of Findings

The findings confirm that the border closure, implemented following the resurgence of the Ebola outbreak, adversely affected the activities of women engaged in small-scale cross-border trade between the Democratic Republic of the Congo and Rwanda. Although nearly 95% of the respondents continued their trading activities, 59.8% reported doing so with considerable difficulty, while 4.7% had to suspend their activities completely. These findings corroborate the work of Foucher (2007) and Martinez (1994), who argue that borders function more as spaces of economic interaction than merely as territorial boundaries. Even when closed, the border remains an essential space of circulation for populations whose livelihoods depend on it. This observation also supports the analyses of Brenton et al. (2011) and Titeca and Kimanuka (2012), who regard small-scale cross-border trade as a critical livelihood and household survival mechanism in the Great Lakes region.

The findings also show that the border closure led to a significant decline in traders' profits. Indeed, 66% of the women surveyed reported a decrease in their monthly income, with some experiencing losses exceeding their usual profit levels. The statistical tests confirm a highly significant relationship between border closure and declining profits ($\chi^2 = 338$; $p < 0.001$), thereby supporting Hypothesis H1. These findings are consistent with the conclusions of the World Bank (2014), COMESA (2020), and UNCTAD (2021), which show that mobility restrictions during health crises lead to income reductions among small-scale traders as a result of increased transaction costs, supply constraints, and declining demand. They also support Williamson's (1985) transaction cost theory, according to which institutional restrictions increase the costs of exchange and consequently reduce the profit margins of economic actors.

The study further reveals that the border closure disrupted the supply chain. Nearly half of the women surveyed (47.3%) were unable to identify alternative local suppliers, while 49.7% reported an increase in the purchase prices of their goods, particularly vegetables and fruits. These findings confirm the work of Little (2007) and Raeymaekers (2013), who highlight the strong economic dependence of border traders on neighboring markets. They also corroborate Golub's (2015) analysis that border closures increase sourcing costs and disrupt established trade networks, with particularly severe effects on perishable goods.

In response to these constraints, women traders developed particularly remarkable resilience mechanisms. The findings show that 66.3% of the traders adopted collective purchasing arrangements, either through their associations or by relying on transporters, a proportion that was statistically significantly higher than the reference value ($p < 0.001$). These findings support Hypothesis H2 and are consistent with the resilience theory developed by Holling (1973) and Béné et al. (2012). They also align with the work of Morris and Saul (2000), according to which

women traders strengthen their adaptive capacity through social networks and collective organizations. Thus, collective action emerges as an effective strategy for maintaining trade flows despite health-related restrictions.

However, this resilience strategy remains imperfect. Women traders reported several constraints associated with collective purchasing arrangements, including delivery delays, loss of control over their goods, and receipt of products that did not conform to their orders. These difficulties illustrate the limitations of informal coordination mechanisms highlighted by North (1990) and Williamson (1985). In the absence of formal contracts and effective monitoring mechanisms, delegating purchasing activities to third parties increases the risks of opportunistic behaviour, monitoring costs, and information asymmetries.

Finally, the findings highlight the significant institutional vulnerability of women traders. Most of them received no external assistance during the border closure; while following the reopening, they expressed a greater need for guidance, coaching, and networking opportunities than for direct financial assistance. This finding is consistent with Diarra et al. (2023), who show that economic resilience in crisis contexts depends more on strengthening local capacities than on short-term interventions. It also supports Ba's (2026) observations regarding the fragility of health governance in eastern DRC, where security and health crises severely constrain the capacity of public institutions to support vulnerable populations.

Overall, the findings of this study demonstrate that, despite the negative effects of restrictive measures on income and supply chains, women engaged in cross-border trade displayed substantial adaptive capacity by mobilizing their associative networks and collective strategies. Collective purchasing arrangements thus emerged as a genuine mechanism of economic resilience in response to the health crisis triggered by Ebola virus disease.

Implications and Research Perspectives

This study demonstrates that restrictive measures adopted during health crises in the Great Lakes region produce effects that extend far beyond public health, significantly affecting the livelihoods of women engaged in small-scale cross-border trade. The findings show that border closures disrupt supply chains, reduce household incomes, and exacerbate the economic vulnerability of women traders, while simultaneously encouraging the emergence of collective coping strategies such as group purchasing arrangements.

These findings call on policymakers, regional organizations such as the Economic Community of the Great Lakes Countries (CEPGL), the East African Community (EAC), and the Common Market for Eastern and Southern Africa (COMESA), as well as technical and financial partners, to better integrate economic and social dimensions into health-crisis management mechanisms. Rather than resorting to generalized border closures, the establishment of secure trade corridors, harmonized health protocols among countries in the region, and institutional support for women traders' associations could help reconcile public health protection with the continuity of economic activities.

From a scientific perspective, this research opens up several avenues for further investigation. A comparative approach would be particularly relevant to examine the effects of health and security crises on cross-border trade along other strategic corridors

in the Great Lakes region, particularly between the Democratic Republic of the Congo, Uganda, Burundi, and Tanzania. Longitudinal studies could also assess the sustainability of the adaptive strategies developed by women traders, particularly collective purchasing arrangements, following the lifting of restrictive measures.

Finally, future research could examine the role of digitalization in trade, electronic payments, and digital platforms in strengthening the resilience of women traders to the health, security, and political crises that characterize the Great Lakes region. Such research would contribute to the development of evidence-based public policies capable of strengthening the economic resilience of border communities in a context of recurrent crises.

Conclusion

This study aimed to analyze the effects of restrictive measures associated with the Ebola outbreak on the activities of women engaged in small-scale cross-border trade between the Democratic Republic of the Congo and Rwanda, within the specific context of the Great Lakes region. The findings show that, despite the continuation of trading activities by a large proportion of women traders, the temporary border closure resulted in a significant decline in profits, disruptions to supply chains, increased purchasing costs, difficulties in stock management, and a reduction in customer numbers. These findings confirm that mobility restrictions, although adopted to protect public health, also generate major economic consequences for populations whose livelihoods depend on the fluidity of cross-border trade.

The study also highlights the remarkable adaptive capacity of women traders. The use of collective purchasing arrangements, mainly organized through women's associations and transporters, emerged as the primary resilience strategy for maintaining business activities despite health and security constraints. However, this strategy remains subject to several limitations, including delivery delays, loss of control over goods, increased transaction costs, and certain risks associated with informal trade channels. The research hypotheses are therefore confirmed: restrictive measures had a significant negative effect on the profits of women engaged in cross-border trade, while collective purchasing arrangements constituted an effective adaptation mechanism in response to the crisis.

In light of these findings, this research underscores the need to promote crisis-management mechanisms in the Great Lakes region that reconcile public health imperatives with the preservation of the livelihoods of border communities. Strengthening women traders' organizations, harmonizing health protocols among neighboring countries, and establishing secure trade corridors emerge as essential pathways for enhancing women's economic resilience in the face of the recurrent health, security, and political crises that characterize the region.

References

1. BA, F. E. (2026). *RDC : la riposte Ebola face à l'instabilité politique et sécuritaire*. IRIS.
2. BENSASSI, S., JARREAU, J., & MITARITONNA, C. (2019). Regional Integration and Informal Trade in Africa: Evidence from Benin's Borders. *Journal of African Economies*, 28(1), 89–118.
3. BISH, A., et al. (2016). The socioeconomic impacts of Ebola in Sierra Leone. *African Journal of Economic Review*.
4. BOURDELAIS, P. (2008). L'épidémie créatrice de frontières. *Les Cahiers du Centre de Recherches Historiques*, 42. Mis en ligne le 3 novembre 2011. <http://journals.openedition.org/ccrh/3440>
5. BRENTON, P., BUCEKUDERHWA, C. B., HOSSEIN, C., NAGAKI, S., & NTAGOMA, J. B. (2011). *Risky Business: Poor Women Cross-Border Traders in the Great Lakes Region of Africa*. World Bank Policy Note.
6. BRENTON, P., GAMBERONI, E., & SEAR, C. (2013). *Women and Trade in Africa: Realizing the Potential*. World Bank.
7. COMESA. (2020). *Impact of COVID-19 on Small-Scale Cross-Border Trade in the COMESA Region*.
8. DIARRA, T., OKEIBUNOR, J., et al. (2023). Epidemic Response amidst Insecurity: Addressing the Ebola Virus Epidemic in the Provinces of North Kivu and Ituri. *Journal of Immunological Sciences*.
9. GASQUET-BLANCHARD, C. (2016). *Ebola, géographie d'une crise sanitaire (1994-2005)*. Presses universitaires de Rennes.
10. GOLUB, S. (2015). Informal Cross-Border Trade and Smuggling. In *Border Economies in Africa*.
11. KODISH, S. R., et al. (2019). Border closures, identity, and disease control: Lessons from the West African Ebola outbreak. *Health Policy and Planning*, 34(8).
12. KRAEMER, M. U. G., et al. (2020). Dynamics of conflict during the Ebola outbreak in the DRC (2018–2019). *BMC Medicine*.
13. LITTLE, P. D. (2007). *Unofficial Cross-Border Trade in Eastern Africa*. FAO.
14. MACHADO, L. O. (2005). Estado, territorialidade, redes. Cidades gêmeas na zona de fronteira sul-americana. Dans M. L. Silveira (dir.), *Continente em Chamas: Globalização e território na América Latina* (pp. 243–284). Civilização Brasileira.
15. MORISHO MWANA BININGO, N. (2024). *Intégration régionale et petit commerce transfrontalier entre la RD Congo et ses voisins : Opportunités et défis*. L'Harmattan.
16. MORRIS, G. A., & SAUL, M. (2000). *Women's Small-Scale Cross-Border Trading in West Africa*. USAID.
17. MOULLÉ, F., & DUHAMEL, S. (2010). *Frontières et santé. Genèse et maillages des réseaux transfrontaliers*. L'Harmattan.
18. MTHEMBU, P., & KORSTEN, L. (2022). Collective action as resilience for informal cross-border traders during pandemics. *Journal of Borderlands Studies*.
19. OIM. (2022). *Enquête sur le petit commerce transfrontalier à la frontière RDC–Rwanda–Burundi*.

20. PERETTI-WATEL, P. (2001). La crise de la vache folle : une épidémie fantôme ? *Sciences Sociales et Santé*, 19(1), 5–38.
21. PRESCOTT, J. R. V. (1987). *Political Frontiers and Boundaries*. Allen & Unwin.
22. RAEYMAEKERS, T. (2013). *Violent Capitalism and Hybrid Identity in Eastern Congo*. Cambridge University Press.
23. REUTERS. (2026, 13 juillet). *Cut off from Kinshasa, Congo's AFC/M23 rebels built their own Ebola response*.
24. ROBINSON, M. (2017). *Le virus Ebola : impact de l'épidémie de 2014-2016 sur la recherche* (Thèse de doctorat en sciences pharmaceutiques). Université de Lorraine. <https://hal.univ-lorraine.fr/hal-01932482/document>
25. RUMLEY, D., & MINGHI, J. V. (1991). *The Geography of Border Landscapes*. Routledge.
26. STEARNS, J. K., et al. (2019). *Rebels, Doctors and Merchants of Violence: How the Fight against Ebola Became Part of the Conflict in Eastern DRC*. NYU Center on International Cooperation.
27. TITECA, K., & KIMANUKA, C. (2012). *Walking in the Dark: Informal Cross-Border Trade in the Great Lakes Region*. International Alert.
28. UNCTAD. (2021). *Impact of COVID-19 on Informal Cross-Border Trade in Africa*.
29. VILLA, J. (2022). Professionnels du désordre et violences organisées durant l'épidémie d'Ebola du Kivu (2018–2020). *Les Cahiers d'Outre-Mer*, 286, 489–521.
30. WELLS, C. R., et al. (2019). The exacerbation of Ebola outbreaks by conflict in the Democratic Republic of the Congo. *Proceedings of the National Academy of Sciences (PNAS)*, 116(48), 24366–24372.
31. WORLD BANK. (2014). *The Economic Impact of the 2014 Ebola Epidemic*.
32. WORLD BANK. (2020). *Women and Trade: The Role of Trade in Promoting Gender Equality*.
33. Boateng, V., Mensah, A. N. K. O., Osei, F. & Teye, E. K. (2026). THE EFFECT OF EMPLOYEE ENGAGEMENT ON ORGANIZATIONAL PERFORMANCE IN GHANAIAN SMEs. *IRASS Journal of Multidisciplinary Studies*, 3(8), 49-57. <http://doi.org/10.67564/IRASSJMS.v3.i8.0183>
34. Opong, N. A. O., Yeboah, K. K., Opong, J. M. & Teye, E. K. (2026). Artificial Intelligence and People Analytics in Human Resource Decision-Making: Opportunities, Challenges, and Ethical Imperatives. *IRASS Journal of Multidisciplinary Studies*, 3(7), 37-44.