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Ally, the pioneering abortion chatbot: Capturing regional variations in self-managed abortion needs☆,☆☆

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ABSTRACT

Objective(s): Moving self-managed abortion (SMA) information and counseling onto digital platforms can greatly increase access to safe abortion worldwide. Ally, an SMA information chatbot, was developed to proactively meet target users in the digital spaces they already occupy, enhancing their access to SMA information. This study sought to identify any regional variations in user behavior while navigating our global, multilingual abortion chatbot to help inform strategies that serve a quickly evolving audience in abortion care access.

Study design: This study utilizes data that have been collected since 2022 from Ally's enhanced tracking platform to analyze user behavior across regions. After cleaning the data and removing outliers, chat durations were categorized into short, medium, and long. Regional engagement was examined, focusing on conversation patterns, popular topics, and drop-off rates. Descriptive and comparative statistics were applied to identify trends in user engagement and regional behavioral differences.

Results: Ally engaged in 95,281 conversations across 172 countries. The chatbot is used differently across regions. Latin American and African users engaged with Ally for longer, more diverse interactions, often seeking detailed information on medical abortion instructions. North American and Asian users, alternatively, seemed to use Ally to fulfill a narrower scope of abortion information, with an emphasis on pill access; thus, their engagement was focused and brief.

Conclusions: Ally's worldwide usership demonstrates a clear demand for abortion chatbot services. Regional differences in user realities, needs, and preferences call for comprehensive, easy-to-use information and resources about SMA so that diverse users in different countries can find what they need in one place.

Implications: Digital tools enhance access to self-managed abortion counseling and information, especially when made available on diverse platforms. The widespread yet regionally nuanced use of Ally, a self-managed abortion information chatbot, demonstrates the potential of abortion chatbot services and offers insight into user realities, needs, and preferences.

1. Introduction

Medical abortion (MA), also known as an abortion with pills, is the process of ending a pregnancy by using mifepristone with misoprostol or misoprostol alone. Research has repeatedly proven the safety and effectiveness of both regimens, in and out of clinical settings [1,2]. It therefore has the potential to greatly increase access to safe abortion worldwide [3].

Using abortion pills to terminate a pregnancy on one's own, partially or fully outside of a clinical setting, is known as a self-managed abortion (SMA). Its origin dates back to the early 1980s when feminist networks in Brazil started call-in hotlines to share information about the off-label use of misoprostol for abortion [4,5]. From 2005 onward, the Internet has increasingly been used to share SMA information and offer online counseling, such as through websites like Women on Web, Women Help Women, and safe2-choose [5–7]. However, the wider medical community has been slow in its adoption of out-of-clinic care models, and it was not until the COVID-19 pandemic and the World Health Organization's 2022 Abortion Care Guidelines that self-care solutions were further normalized and recommended [6,8].

Moving SMA information and counseling onto digital platforms can expand its reach while also contributing to a wider dismantling

☆ Conflicts of interest: The authors are associated with Women First Digital, the organization operating HowToUseAbortionPill.org and the Ally chatbot.

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of abortion stigma and misinformation. However, it is not a panacea: digital spaces present their own range of obstacles, including data costs, privacy concerns, and volatile resource visibility as a result of Big Tech's algorithmic and policy gatekeeping. To address these challenges, online SMA resources must diversify their user access points to "meet women [and other pregnant people] in the digital spaces they already occupy" [6, p. 6]. Chatbots can fulfill this need by automating personalized support while integrating across a diversity of channels, platforms, and other existing resources [9], thus scaling access to abortion information well beyond a web page.

With this strategy in mind, HowToUseAbortionPill.org developed Ally, an SMA information chatbot. Ally was designed to invert the typical website-chatbot relationship: while chatbots are commonly developed to support users as they navigate a website, Ally is a condensed version of a website that can integrate into other platforms where target audiences are already congregating, including social media (often included for free within data packages in some target countries) and partner websites. Ally allows users to self-navigate through their queries while also linking to trusted local resources. It is available in six languages with enhanced accessibility features like voice support; it can operate across websites, Facebook, Instagram, and WhatsApp; and it is globally marketed. In this study, Ally's worldwide use is analyzed to provide insight into the complexities of user needs and preferences. These insights can help the sexual and reproductive health community adapt and refine its strategies to better serve a quickly evolving global audience in abortion care access.

2. Materials and methods

Since 2022, after implementing a new tracking platform with more extensive data, Ally has rigorously gathered user data, analyzing metrics like user and conversation numbers, conversation patterns, popular topics, session durations, and drop-off rates. This paper examines these data to understand behavioral patterns in the regional use of Ally.

2.1. Data cleaning and analysis

An initial chat duration analysis revealed a right-skewed distribution, with a few very large duration values. These extreme outliers, caused by a system bug, were removed using the interquartile range method, resulting in the exclusion of 10.67% of conversation durations and leaving 89.33% of the data for a more accurate analysis.

2.2. Categorization of chat durations

Following the removal of outliers, chat durations were segmented into three categories: short (≤1 second), medium (2–208 seconds), and long (> 208 seconds) based on quartiles. This refined data set, though still right-skewed, provided a clearer view of typical chat durations.

2.3. Regional analysis

User interactions were analyzed across Africa, Latin America, Asia, and North America to identify regional variations in engagement, including the proportion of short, medium, and long chats and inquiry types. User location was determined through internet protocol (IP) address tracking for those accessing Ally via the HowToUseAbortionPill.org website and other partner websites, while other users had the option to share their locations voluntarily. Although website users' locations are determined through their IP addresses, we do not store IP addresses or any other personally identifiable information, ensuring user privacy is maintained at all times.

2.4. Inquiry types and drop-off rates

User inquiries were categorized into specific topics, such as instructions on how to use the pills, safety concerns, how to access the pills, specific abortion protocols, and requests for referrals to counselors. These categories were analyzed to identify the most common inquiries within each region. Drop-off rates were also calculated to assess user engagement.

2.5. Statistical analysis

Descriptive statistics were employed to summarize user engagement patterns, including the average number of interactions, conversation durations, and drop-off rates. Proportions of inquiries by topic and region were calculated to identify significant trends. Comparative analysis across regions was conducted to uncover differences in user behavior and engagement with Ally.

3. Results

From August 2022 to June 2024, Ally engaged in 95,281 conversations with 73,454 unique users across 172 countries. The top five countries with known user populations are Kenya (13.14%), Mexico (10.72%), Nigeria (10.23%), Ghana (9.31%), and the United States (7.45%). Regionally, Ally is more widely used in Africa, followed by Latin America, Asia, and North America (Fig. 1).

3.1. User behavior

Of all the conversations with Ally, 40.88% were classified as medium, characterized by an average of 3.76 interactions and a duration of 71.62 seconds (Table 1). Long conversations, which account for 22.32% of the total, involved an average of 12.04 interactions and lasted approximately 422 seconds. Meanwhile, 26.12% of the conversations were short, with an average of 0.49 interactions lasting 0.18 seconds, typically indicating either quick queries or incomplete conversations (drop-offs).

Engagement levels with Ally show a significant variation across regions (Table 2). In Latin America, only 14.73% of conversations were short, while the remaining 85.27% involved an average of 8.86 interactions and lasted approximately 210 seconds. In Africa, 25.15% of conversations were short, with the remaining 74.85% averaging 5.84 interactions over 218 seconds. In Asia, 29.67% of conversations

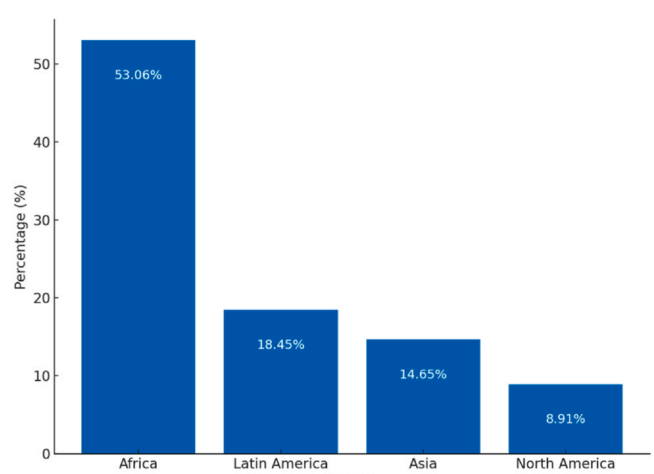

Fig. 1. Distribution of users by region, $N = 95,281$.

Table 1
Conversation length summary, $N = 85{,}115$

Conversation type	Percentage of total conversations (%)	Average interactions	Average duration (seconds)
Short	26.12	0.49	0.18
Medium	40.88	3.76	71.62
Long	22.32	12.04	422.00

Table 2
Regional engagement summary, $N = 85{,}115$

Region	Short conversations (%)	Medium conversations (%)	Long conversations (%)	Avg. interactions (remaining conversations)	Avg. duration (s; remaining conversations)	Drop-off rate (%)
Latin America	14.73	28.26	45.40	8.86	210	30.98
Africa	25.15	25.53	38.14	5.84	218	42.47
Asia	29.67	15.26	47.92	4.16	147	58.06
North America	24.56	14.80	52.55	4.77	139	52.24

were classified as short, with the remainder averaging 4.16 interactions and lasting around 147 seconds. Meanwhile, in North America, 24.56% of conversations were short, with the remaining averaging 4.77 interactions over a duration of 139 seconds. Drop-off rates were significantly higher in Asia and North America, at 58.06% and 52.24%, respectively, compared to 30.98% in Latin America and 42.47% in Africa. These findings indicate that Latin American and African users exhibited higher engagement, having the majority of long and more interactive conversations and lower drop-off rates. In contrast, Asian and North American users showed a greater proportion of short conversations with fewer interactions and significantly higher drop-off rates.

The varying user engagement across regions can have different explanations; however, it is apparent that they are related to the users' specific needs and intents when interacting with Ally.

3.2. User intent

An analysis of conversation patterns among users (Fig. 2) revealed that they predominantly seek information on how to access and use abortion pills, the specific protocol combining mifepristone and misoprostol (Box 1), and safety concerns. Additionally, a significant portion of these conversations involved requests for referrals to human counselors.

In Latin America, the most common inquiry during conversations was about instructions on how to use the pills, accounting for 68.92% of queries. Safety considerations, such as questions about the "aftereffects of pills" or whether pills are "safe" were present in 48.36% of conversations, while 46.89% involved inquiries about the combination protocol (mifepristone with misoprostol). Additionally, 29.62% of users requested referrals to human counselors, and 29.85% sought information on how to obtain the pills (Fig. 2).

For conversations originating from Africa, the leading inquiry was also about pill instructions, making up 37.27% of the interactions. This was followed by 27.92% of conversations focusing on how to access pills, 27.56% on the combination protocol, and 22.67% on safety considerations. Requests for referrals to human counselors were observed in 17.94% of these interactions.

In Asia, the primary inquiry was how to use the pills, constituting 23.01% of conversations. This was closely followed by questions on how to obtain the pills (19.97%), inquiries about the combination protocol (16.54%), safety considerations (15.41%), and requests for referrals to human counselors (14.48%).

In North America, the predominant query was about how to obtain the pills, accounting for 34.38% of the conversations. This was followed by instructions on pill use (21.21%), inquiries about the combination protocol (18.76%), safety concerns (12.86%), and requests for referrals to human counselors (10.43%).

The data reveal that while users across all regions seek instructions on how to use pills, the specific focus of their inquiries varies. Latin American and African users show a strong emphasis on understanding how to use the pills (especially for the combination protocol) as well as their safety, reflecting a need for detailed guidance. In contrast, North American users show more interest in

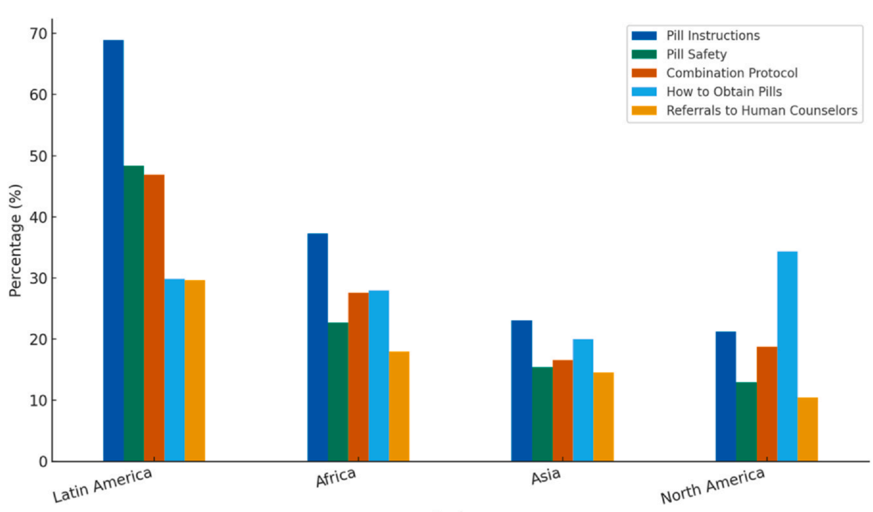

Fig. 2. Percentage of users inquiring about specific topics across regions, $N = 95{,}281$.

Box 1
Abortion protocol search patterns.

A total of 44.12% of conversations were about seeking information on either the mifepristone with misoprostol or the misoprostol-only protocol. More inquiries were made about the mifepristone with misoprostol protocol compared to misoprostol-only. Notably, users who searched for the mifepristone with misoprostol protocol did so either exclusively (34.00%) or alongside the misoprostol-only protocol (66.00%), with no users searching solely for the misoprostol-only protocol. However, differences were observed across regions (Fig. 3), with Latin America leading requests for the combination protocol (46.89%), although more often in combination with the misoprostol-only protocol (33.30%). Africa also showed a notable interest in the combination protocol (27.56%), while the interest for misoprostol-only was significantly lower (10.01%). In contrast, Asia and North America exhibited lower overall percentage interests for both protocols, although with a higher interest for the combination protocol.

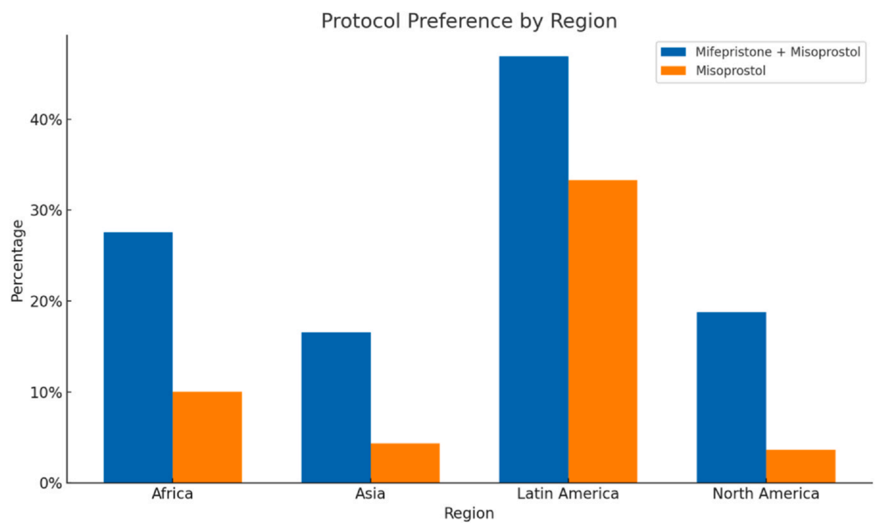

Fig. 3. Protocol preference by region, $N = 43{,}038$.

accessing the pills, indicating potential barriers to availability. While Asian users also show a high interest in access to pills, they demonstrate more interest in how to use the pills than North American users. Although Asian users navigate the same topics as other regions, their overall engagement is less.

4. Discussion

An abortion with pills can be safely and effectively self-managed at home, as long as there is access to accurate information and quality medications. This can be particularly crucial for communities that have historically been underserved by health systems or face challenges accessing health care services [10]. Nonetheless, it is commonly practiced in all contexts, including those with adequate access to abortion care through the formal health system, as it can offer a more private and natural abortion experience [10]. Though often framed as a last resort, SMA is a valid alternate care model [11], as it makes women and other pregnant people the decision makers of their own experiences, "shift[ing] power away from the institutionalized medical system" [8, p. 3].

This offers tremendous potential to expand worldwide access to safe abortion, particularly when leveraging digital tools to amplify accurate, demedicalized SMA information and counseling in complement to on-ground resources. However, in the quickly changing digital landscape in which artificial intelligence and frequent Google algorithm updates are highly impacting what information is visible online [12], diversifying user access points to abortion information will become increasingly essential. Automation can particularly contribute to the scaling, localization, and optimization of SMA support. However, "abortion seekers" are not a homogenous group; they are widely diverse and so are their online preferences and needs. This analysis of the interactions with the Ally SMA chatbot shows that people use it for different needs and during diverse parts of their abortion journey, although clear trends across regions can be observed.

Latin American and African users exhibit higher engagement and have the majority of long and more interactive conversations, while Asian and North American users engage in a greater proportion of short and medium interactions. This seems to be directly related to their intent for using Ally. Latin American and African users make Ally part of their wider abortion journey as they make a more engaged and diverse use of the chatbot. They more frequently use Ally to obtain information about MA instructions, and they inquire about specific protocols (mainly mifepristone with misoprostol) significantly more than users from other regions. This means that they are consulting Ally for more information purposes, although they often combine this with inquiries on how to obtain the pills or referrals to human counselors. North American and Asian users, conversely, seem to use Ally to fulfill a narrower scope of abortion information, with an emphasis on pill access; thus, their engagement is more focused and brief. North American users' focus on accessing the pills is in line with the restricted access post-*Roe* and could indicate that users are quickly finding the needed information and prefer other resources for continued support, if needed. Although Asian users are more interested in also getting information on the wider abortion process than North American users, they have the lowest engagement of the four regions. This could indicate that the chatbot resonates less with their specific (online) SMA needs and preferences. However, the sociocultural context could be more deeply at play here as the Asian region is particularly diverse and Ally's languages have limited reach there, while there might also be more competition from other resources.

More qualitative insight into users' motivations and a deeper understanding of offline to online (and vice versa) SMA user journeys are necessary to better grasp the underlying reasons. As it is difficult to follow the user's journey to other online or offline spaces, there is minimal chance of finding out more about Ally's success in providing the needed information or in connecting abortion seekers to abortion pills or further support. While this study is a first look at how and why users interact with a global, multilingual abortion chatbot, future efforts may consider diving deeper into specific user behavior or contexts. Due to the limitations of this study, only regions have been compared, and each region in itself is highly diverse. To better understand Ally users, a deeper analysis should be conducted across countries, taking cultural, legal, and social factors into account. It would be valuable to co-relate these findings with the supply of abortion pills locally, the legality of abortion, and other available digital resources.

The regional differences suggest that Ally's use is impacted by region-specific needs, cultural contexts, and general access to resources. While more research needs to be done to understand users in various contexts, this study demonstrates that a comprehensive, easy-to-use chatbot can respond to a wide variety of user needs, making it possible for users from different countries to find what they need about SMA in one place.

Author contributions

D.F.: writing – original draft, visualization, methodology, formal analysis, conceptualization. K.M.: writing – review & editing, writing – original draft, supervision, conceptualization.

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Data statement

The data that support these findings is subject to security restrictions and will not be publicly available due to information that could compromise the privacy and security of users and the chatbot service. However, data can be made available by the corresponding author on a per-request basis if approved by Women First Digital. All identifiers will be removed.

Appendix A. Supporting information

Supplementary data associated with this article can be found in the online version at doi:10.1016/j.contraception.2025.110942.

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Glossary

Medical abortion: The process of ending a pregnancy by using mifepristone with misoprostol, or misoprostol alone – also known as an abortion with pills.
Self-managed abortion: An abortion with pills managed either partially or fully outside of a clinical setting. In this article, this is also referred to as "out-of-clinic care models" and "self-care solutions."
Automation: The use of technology to deliver responses and perform tasks without (or with limited) human intervention.
Chatbot: A digital tool designed to simulate human conversation with users using predefined rules or artificial intelligence (AI) to process and respond to user input in a conversational manner.
Drop-off rate: Percentage of users who ended conversations prematurely, typically after receiving a welcome message from the chatbot.
Right-skewed distribution: Data points concentrated on the left side, with the tail extending to the right. This means a few unusually higher values pull the mean to the right, making it greater than the median.
User behavior: A set of actions, preferences, and patterns that users demonstrate when interacting with the chatbot.
User intent: Underlying motivation of users when interacting with the chatbot.
Conversation: A limitless exchange of messages between user and chatbot that does not pause for more than 24 hours.
Interactions: Inquiries or messages a user sends to the chatbot during a conversation.