# The Search for Paxlovid: Medication Acquisition as Anticipation Work After China's Zero-COVID Policy

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In early December 2022, China's zero-COVID policy came to an end. For Chinese citizens, an imaginary of safety predicated on collective action and state care was replaced with a general focus on individualized responsibility for maintaining one's health. This expedited policy reversal had the unintended effect of infecting around 80% of China's population in one month, leading to a period of confusion, anxiety, and infection. One way of obtaining safety in a precarious time was to acquire medical resources. Through an online ethnographic investigation, we trace the acquisition of Paxlovid, an antiviral medication that had its distribution within China complicated by geopolitical tension and supply issues. By attending to the precarity of Chinese citizens at home and abroad, we show how Paxlovid was desired in both the present tense for the presently ill and in the future tense as an anticipatory form of safety. We use the analytical lens of anticipation work to unpack individual, collective, and state anticipatory practices supported by various social media platforms within and across borders. In doing so, we highlight moments of friction between and among various actors to argue that attending to affect, precarity, and practices in moments of conflict is critical to understanding the complexities of computer-supported cooperative work.

CCS Concepts: • **Human-centered computing** → **Computer supported cooperative work**; **Ethnographic studies**; Social media; • **Social and professional topics** → *Geographic characteristics.*

Additional Key Words and Phrases: COVID-19, Anticipation Work, China, Imaginary, Precarity, Safety, Online Ethnography, Social Media

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## 1 INTRODUCTION

In early December 2022, the first official national changes to the Chinese COVID-19 restriction policies were announced, three years after the country's zero-COVID policy measures were put in place. China's measures remained strict throughout the pandemic in their restrictions on travel, the frequency and importance of testing, and the ubiquity of mobile tracking one's health status [50]. As such, COVID-19 transmission rates in China were significantly lower than in other countries, but restrictions and limitations on personal freedoms led to protests and public outcry [24]. By December 7th, the Chinese government's zero-COVID measures suddenly came to an end, replaced with "ten new measures" (新十条*xin shi tiao*) that loosened restrictions and placed the burden of COVID-19 safety in the hands of the individual [70].

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This expedited policy reversal had the unintended consequence of infecting around 80% of China's population with COVID-19 by late January 2023, according to Chinese health authorities [73]. The speed at which years-long measures were rescinded led to a period of discontent, confusion, anxiety, and infection that was not dissimilar from that seen globally since 2020: individuals did not know which public spaces were "safe"; medical and over-the-counter supplies, such as ibuprofen, fever reducers, and cough medicines, were hard to purchase; hospitals struggled to accommodate a revolving door of newly administered patients; and individual and collective grief for the deceased, ill, or recovering became an impossible preoccupation. At this critical moment, state media Xinhua News Agency called upon citizens to pursue active and individualized safety: "Everyone is the first person responsible for their own health" (每个人都是自己健康的第一责任人*mei ge ren dou shi zi ji jian kang de di yi ze ren ren*) [95].

In this paper, we draw on ethnographic research conducted online over a six-month period to investigate how Chinese individuals, both at home and abroad, attempted to acquire antiviral medication in response to this national policy reversal and expedited retreat of "state care" [50] that created a large-scale healthcare crisis. In particular, our work traces the acquisition of nirmatrelvir and ritonavir, packaged and sold by Pfizer under the name Paxlovid. At the time of China's policy reversals, Paxlovid was the only approved foreign antiviral medication on China's register of approved medications for basic medical insurance [29]. Its uniqueness as an antiviral medication to treat severe COVID symptoms, its material shortages, and the laborious processes of acquisition made Paxlovid a desired commodity as the pandemic burdened China's medical system. By following Paxlovid, we ask: *How did Chinese citizens acquire Paxlovid and how does Paxlovid acquisition speak to greater issues of precarity during this moment of crisis in a time of geopolitical tension?*

By tracing Paxlovid's associations, we investigate Paxlovid's legal channels of access, Paxlovid's ad hoc distribution networks in both the U.S. and China, and how social media platforms, such as WeChat (微信), Xiaohongshu (小红书), Zhihu (知乎), Facebook, and Telegram, are involved in and support the movement of Paxlovid, information about Paxlovid, emotional experiences during difficult times, and the complications of geopolitics and relations between China and the U.S.[1] Following the drug Paxlovid, in other words, allows us to shed light on the interplay between individual precarity, social media platforms, healthcare profiteering, and geopolitics.

We consider Paxlovid as both a "thing" and "notion" [6], sought after both in the present tense for its immediate medicinal applications and in the future tense as an anticipatory form of safety [2, 26]. In considering the temporality and affect[2] of Paxlovid acquisition, we elaborate on Steinhardt and Jackson's CSCW scholarship on the concept of *anticipation work* [83]. Anticipation work, in this case, encompasses the individual and collaborative practices "that cultivate and channel expectations of the future", established on affective and speculative grounds [83, p.443]. Additionally, by tracing Paxlovid associations, we shed light on the disruption of a Chinese *state imaginary* of stability [12], which was upended and replaced with individualized precarity. Within this context, such precarity led to speculation, gray markets, dubious methods of acquisition, and ad hoc connections facilitated by social media platforms.

We contribute to CSCW in two ways. First, we extend CSCW literature on anticipation work by providing a new empirical context through which to consider the affective, collaborative, and temporal dimensions of anticipation work. In doing so, we highlight moments of precarity to focus on friction within the ostensibly collaborative aspects of anticipation work.[3] In particular, we conclude that individual moments of anticipation work can "contradict" [83] collaborative moments

[1]See this paper's appendix for short descriptions of each platform

[2]Affect is taken to mean a "kind of feeling and thinking which is indeed social and material, but each in an embryonic phase before it can become fully articulate and defined" [94, p.131]

[3]Precarity is taken to mean an affective state of discontinuity and insecurity [20]

of anticipation work, adding a social complication to literature that often focuses on infrastructural or technical difficulties. Second, we contribute to ongoing research on China's governance [101] and crisis literature (e.g., [79]) by suggesting that policy reversal, shifts in discourse, and trade disagreements left citizens vulnerable during a critical shift from collective to individualized conceptions of safety. In keeping with anticipation work, during the years of zero-COVID policy in China, a common future was established, predicated on collective safety and active governance. But what happens when that common future is abandoned? We offer a reflection on anticipation work at collective and individual levels. We argue that attending to affective and material precarity at small scales is critical to understanding the complexities of collaborative work.

## 2 BACKGROUND

### 2.1 COVID-19 Policies in China

During the first years of the COVID-19 pandemic, the Chinese government enforced strict zero-COVID policy measures that emphasized collective safety in the form of mass nucleic acid and antigen testing, digital health codes to gain and restrict access to travel, and centralized quarantines. By November 26th, 2022, Xinhua News Agency released an editorial commentary that called for individual precaution, one of the first state documents to conflict with the collective precaution found in previous commentaries. The piece stated that, "Everyone is the the first person responsible for their own health" [95]. On December 7th, the National Health Commission (国家卫生健康委员会*guo jia wei sheng jian kang wei yuan hui*) introduced "ten new measures" that further loosened COVID-19 management nationwide [18]. As such, policy measures that had been in place for years were undone overnight.

On January 8th 2023, COVID-19 was re-classified as a "class-B infectious disease" in the Law on Prevention and Control of Infectious Diseases (传染病防治法*chuan ran bing fang zhi fa*), which terminated centralized control of the disease within federal law. The above "ten new measures" and updated laws encouraged citizens' self-led, individualized healthcare and new approaches to COVID-19 response from public medical institutions such as hospitals. Compared with one another, the initial zero-COVID policies and the "ten new measures" policies appear contradictory. The former focused on the collective efforts of both the national government and Chinese citizens and highlighted government efforts that "prioritized the people" (人民至上*ren min zhi shang*) and protected the life and health of each citizen "at any price" (不惜一切代价*bu xi yi qie dai jia*). These zero-COVID policies were then replaced by state policies that deferred government responsibility and foregrounded individual efforts.

### 2.2 Paxlovid, Pfizer, and Medicines Patent Pool

Concurrent with these changes, Paxlovid, at that time the only approved COVID-19 antiviral medication by the Chinese National Medical Products Administration (国家药品监督管理局*guo jia yao pin jian du guan li jv*), became available for cost reimbursement via the state's healthcare security for emergency purposes [29]. Paxlovid was approved by the state as early as February 2022 but it was not until January 2023 that the Chinese National Health Commission put forward guidance for treating severe COVID-19 cases and recommended Paxlovid as the best available treatment method [17]. Between these key dates of Paxlovid's approval in February 2022 and Paxlovid's recommendation in January 2023 was an extended and complex bureaucratic process to manufacture, import, and distribute Paxlovid and generic variants within China.

Paxlovid is an antimicrobial medication, specifically, a small-molecule antiviral. An antiviral medication targets viruses through the identification of viral proteins that are then disabled within the host, therefore suppressing the virus [99]. Paxlovid is most commonly prescribed early, usually

within the first five days after an individual is infected with the COVID-19 virus; as an antiviral, Paxlovid can help prevent severe illness but requires the presence of COVID-19—in other words, it is ineffective as a preventative measure. Paxlovid was found to reduce hospitalization in high-risk patients by 89% and was "strongly recommended" by the World Health Organization in early and mid-term treatments of high-risk individuals [60, 66].

While much has been written of Pfizer's intellectual property strategies (see: [75]), the company proclaimed an interest in delivering Paxlovid wherever it is needed and at affordable prices. As a gesture of good faith, the company signed a number of agreements to improve access to Paxlovid, including a voluntary license agreement with Medicines Patent Pool (MPP) [64]. This agreement facilitates a supply of generic Paxlovid to 95 low- and middle-income countries. Within the Medicines Patent Pool agreement, the MPP has signed sub-licensing agreements with 36 manufacturers to supply the generic Paxlovid [103]. Additionally, Pfizer signed agreements with various countries to stagger the price of name-brand Paxlovid.

### 2.3 Paxlovid in China

In China, the MPP sub-licensing agreements included 5 Chinese manufacturers—Desano, Apeloa, Zhejiang Huahai, Fosun, and Jiuzhou [103]. However, in Pfizer's voluntary agreements, China was not included as one of the low- and middle-income countries that could acquire generic Paxlovid or name-brand Paxlovid at a discount. As such, generic Paxlovid could be *made* but not *sold* in China: per Pfizer's CEO Bourla, "We are not in discussions [with China]. We have an agreement already for local manufacturing of [name-brand] Paxlovid in China" [74]. On March 9th, 2022, Pfizer gave Genertec Meheco (中国医药*zhong guo yi yao*), a Chinese state-owned enterprise, the right to import and distribute Paxlovid in China [67, 72].

Because of the lack of frequent transmission of COVID-19 during the zero-COVID measures period, Paxlovid was not frequently imported. Throughout 2022, Pfizer only imported a few thousand boxes of Paxlovid to China, according to Pfizer CEO Bourla [71]. On December 14th 2022, soon after the "ten new measures" policy changes and an increase in transmission, Genertec Meheco and Pfizer negotiated to extend their agreement [51, 57]. By December 22nd, 2022, community hospitals in Beijing, Shanghai, and a few other cities were beginning to receive increased but still limited supplies of Paxlovid.

### 2.4 Failed Negotiation between the Chinese Government and Pfizer

Pfizer's plan for localized name-brand Paxlovid production in the Chinese market hit a roadblock when talks between Pfizer and China's National Healthcare Security Administration (NHSA) (医保局*yi bao jv*) fell apart. For the NHSA, the price of name-brand Paxlovid was too high. Chinese negotiators attempted a price near 200 yuan ($29) per box [58], about $500 less than Paxlovid was being sold for in the U.S. market. Pfizer declined, with Bourla quoted as saying, "They are the second-highest economy in the world, and I don't think that they should pay less than El Salvador" [69]. Soon after, Paxlovid was dropped from China's annual list of approved medications for basic medical insurance, with the NHSA only negotiating once a year for inclusion into its catalog [47]. Speculation arose as to why negotiations fell apart: Chinese journalist Cheng Yizhong said the NHSA wanted profits to stay "in house": "if Pfizer enters the Chinese market, regardless of whether it is covered by NHSA or by the patient's own pockets, a foreign company gets the profit" [59]. In response to the failed Pfizer talks, Chinese netizens accused Pfizer of profiteering, while state media Global Times asked, "If [Pfizer] cares about [the pandemic in China], why don't they drop the pursuit of profit, and cooperate with China with a little more sincerity?" [69]. A week later, the NHSA announced the Chinese-developed antiviral medicine Azvudine had been approved for public use and reimbursement alongside traditional Chinese medicine Qingfei Paidu decoction [44].

The failed talks between the NHSA and Pfizer complicated the importation, manufacture, and distribution of Paxlovid in China. This had the effect of keeping Paxlovid out of reach for many citizens, who were attempting to acquire it. Consider an op-ed [89] by the CEO of a digital telehealth platform company,

> The reality of the situation became even more personal when I lost a close family member living in China to COVID-19. (...) I leveraged my network in the global pharmaceutical supply chain, spending days negotiating with generic manufacturers in the U.S. and Canada and nights connecting with Chinese buyers. Despite my efforts, my hands were tied: the Chinese government is not allowing Paxlovid generics to be imported, as it tends to keep its pharmaceutical supply chain in-house.

This case of Paxlovid distribution in China is situated within the larger and ongoing shifting relations between China and the U.S. Geopolitical tension also surfaced in the distribution of COVID-19 vaccinations as the Pfizer-BioNTech and Moderna vaccinations were not available in China despite, for instance, the Shanghai Fosun Pharmaceutical Group's licensing of the Pfizer-BioNTech vaccination [56]. Within these global-scale issues regarding supply and distribution are the human-scale issues of individual acquisition, illness, and death. We attempt to account for such individual precarity in the face of global tension to show that sudden state retreat led to individualized labor on the ground.

## 3 RELATED WORK

### 3.1 Affect and Objects as Things and Notions

In this work, we investigate affect. Affect here refers to a "kind of feeling and thinking which is indeed social and material, but each in an embryonic phase before it can become fully articulate and defined" [94, p.131]. We examine associations and actants in an affective register, considering a temporally-bounded moment as having felt dimensions. Within an economy of meaning, abstractions and other systems of meaning are co-constructed by social groups and their attendant socioeconomic relations [5, 25]. In the replication of these myths, signifiers, and feelings, they teach, naturalize, constrict and, in general, impact the human sociocultural imagination. We investigate affect and systems of meaning on different scales, following the different actants within our networks, from individual citizens to the state.

Within CSCW and adjacent literature, objects of inquiry are both material and affective. For older adults, some technologies feel belittling, as when the installation of a stairlift feels like an admission of aging. The stairlift can be in disuse despite its value due to how it is *felt* [81]. Elsewhere, algorithms have been investigated for how they are understood by the public. For Beer, algorithms are both thing and notion, both the thing itself and a "notion" of the algorithm in the abstract: "We need to look beyond the algorithms themselves to explore how the concept of the algorithm is also an important feature of their potential power" [6, p.7]. In this way, the power of an algorithm is not in its design and implementation but in how it is felt and how it is understood as "objective" and "powerful". Those feelings can organize communities and society at large.

The affective notions of technologies are especially felt during moments of precarity. In Kaziunas et al. (2019), systemic health disparities are investigated through infrastructural decay [39]. In this work, the brokenness of healthcare infrastructure and the difficulty of acquiring effective care for chronic illnesses leads to precarious attempts to negotiate health and care through a variety of workarounds, costly visits, and self-care practices. These negotiations have an affective register, in which different medicines each come with notions of safety or anxiety that are outside of, or in spite of, their medicinal value.

We uncover a network of individuals searching for the antiviral medication Paxlovid during the reversal of China's zero-COVID policy. In this case, the precarity of the situation led to enterprising behaviors from Paxlovid buyers and sellers, where negotiations and relationships formed and dissolved on localized scales as affective responses to state policy and larger networks of production and distribution. In our work, we attend to affect at both individual and national levels. We suggest various actors within the Paxlovid acquisition network attach different feelings and values to this antiviral medicine. For individuals, the scarcity and difficulty of acquiring Paxlovid places different meanings and associations on the medicine compared to the state as a whole, where a sociotechnical imaginary of self-sufficiency extends to pharmaceutical development, production, and distribution. The imaginary of a self-sufficient China, we suggest, left a gap in the fight against COVID-19, until homegrown antiviral medications were made readily available. In that gap of time are the stories herein. We further consider the work undertaken during this time to be anticipation work.

### 3.2 Social Media and Anticipation Work in Times of Crisis

Previous literature has discussed how the COVID-19 pandemic inspired coordination among heterogeneous actors through the use of social media platforms, inspiring a rich subset of crisis informatics literature (see, for instance: [19]). Haesler and colleagues identified virtual collaborative volunteerism as complementary to national emergency services, as when during a crisis, social media platforms facilitate networks that connect individual actors to collaborative information and mediated, networked activities [30]. At the same time, social media platforms also trigger misinformation, as Huang and colleagues discovered in their work on how proximity to a crisis inspires emotional states like anxiety and the spread of rumors [36]. Such misinformation requires daily fact-checking to maintain the flow of information in times of crisis [28, 54]. This research highlights human labor, organized and networked, in the processes of coping with crisis. We extend this line of scholarship on social media use in crisis by showing the individualized work carried out by individuals that supported their own security in the face of sudden precarity posed by the reversal of zero-COVID policy measures and pay particular attention to conflict in spaces of coordinated work.

In a Chinese context, previous research has investigated Chinese applications used to support safety during the COVID-19 pandemic [40, 45], how Chinese individuals maintain technological stability from the ground-up during lockdown [12], and how individual affective states were structured by state's affective governance techniques [101]. For instance, Zhang differentiates between three kinds of emotions that were promoted and politicized by the state in its official discourse distributed through social media platforms. Such affective governance with the help of social media builds an imaginary of "a continuous nationhood rising from disasters and humiliations, positive energy, and a dichotomous view of the international order characterised by Western hegemony and Chinese victimhood" [101, p.241]. This imaginary omits precarity; we attend to such feelings in our investigation of post-zero-COVID. We look into how this precarity inspires individuals to take on anticipation work.

We draw on the concept of anticipation work. Originally used by Adams et al., anticipation work can be understood as work undertaken in the present while looking towards the future, work in which the "future sets the conditions of possibility for action in the present" [2, p.249]. In the case of CSCW, Steinhardt and Jackson brought anticipation work to the attention of collaborative work researchers [83]. Anticipation work is done as a way to "navigate daily life and to sustain relations" [61], for both individuals, collectives, and the state. For instance, in the case of climate change, individuals, collectives, and governments each anticipate future uncertainties from the present vantage point and, thus, make decisions in the present about the future that affects both present and future realities—"not only guess[ing] about events (...) but direct[ing] them" [33, p.558].

For Adams et al., such anticipation work is a dominant preoccupation of our present moment [2]. In human-computer interaction and CSCW research, anticipation work has been used as an analytical framework to investigate refugee support work in Turkey [26], collaborative analytics during the Ebola crisis of 2014-2015 [34], and community-based HIV work in India [41]. Here, we consider anticipation work in a particular context: for Chinese citizens, both at home and abroad, after zero-COVID policy measures were lifted. We look into: individual anticipation work or the work done by each individual to speculate on the future health of themselves and their families; collective anticipation work or spontaneous work done by Chinese citizens to make sense of their current precarity, including the sharing of information related to the search for medicine; and state anticipation work or the imaginary of the state, in our case, the imaginary of collective safety and Chinese self-sufficiency during the pandemic.

## 4 METHODS

Our investigation into the search for Paxlovid follows a multi-sited online ethnographic approach. This work is "multi-sited" as we trace how ideas, affect, and artifacts can travel across locations and contexts and cross-cut the local and global. In this, we are informed by Marcus's mode of inquiry to "follow the thing"—in our case, Paxlovid [48, 84]. For instance, in our research, a social media post about Paxlovid links to a different application that further links to an "Internet-based hospital" and to offline everyday life—in this way, we examine how platforms and their users facilitate and complicate acquisition of Paxlovid. We uncover connections and disconnections that inform an antiviral medication's journey to its various destinations while focusing on the individuals who influence its movement.

### 4.1 Data Collection

Online ethnographic research seeks to understand "shared practices, meanings, and social contexts, and the interrelations among them" of phenomena predominately taking place through digital means [84, p.67]. Here, our object of inquiry—Paxlovid—is a material object being discussed and acquired through digital means, from social media platforms to informational news articles online to Internet-based hospitals. Within our ethnographic work, we took various approaches to knowing the space, and each approach had varying degrees of involvement and participation among our informants [82]. This research was approved by our university's institutional review board.

We participated in and observed social media groups related to Paxlovid on both WeChat and Telegram, held informal and formal interviews, in person and in Zoom audio/video chat, and textual chats on WeChat with participants. We initially recruited participants through advertisements on Xiaohongshu, WeChat Moments, and WeChat groups for diaspora Chinese in multiple American cities. We also privately messaged individuals who posted their experience of acquiring Paxlovid on Xiaohongshu. Recruitment was difficult due to the politicized nature of the moment and the preoccupations of potential participants. As such, as a move towards anonymity and to recruit participants who might not have wanted to communicate in person or on Zoom, we transformed our semi-structured interview document into a form on the experience management website Qualtrics. This form allowed potential participants to answer our semi-structured interview questions anonymously and at their own pace. This form was designed with a blank space for each question so that the participants can leave comments. This form was advertised alongside and as an alternative to our more traditional audio or in-person forms of interviewing. Many participants did not want their names or demographic information collected—as such, all personal identifying information was anonymized. All names within this paper are pseudonyms. In total for our semi-structured interviews, we recruited 14 participants, including four Chinese participants currently living in the U.S. and ten Chinese participants currently residing in mainland China. Additionally, we reached

out to 2 individuals who sold Paxlovid online and conducted informal interviews with them and observed their promotion of Paxlovid by using WeChat Moments and WeChat groups.

We were aware that our participants were in vulnerable positions—following Warford et al.'s recent work on "at-risk users" [93], we designed our interview questions and general approach to recruitment and onboarding to minimize the potential of adding additional harms. We piloted our initial research questions by an individual who had acquired Paxlovid, to see if they seemed appropriate [9]. As in work such as Hamilton et al., we made it clear that participants are in control of the research process—for instance, that they could drop out at any time, skip any questions they did not feel comfortable answering, and contribute false information, like pseudonyms [31]. We took caution in how we asked particular questions, not asking outright about the legality of their Paxlovid acquisition but, instead, asking participants to walk us through how they acquired Paxlovid. This approach allowed participants to divulge whatever information they felt comfortable with. Some of the questions included: "When and where did you first hear of Paxlovid?", "Could you take me through the process of acquiring Paxlovid?", "Were there challenges in acquiring Paxlovid?", "Did you ask anyone for help? If so, how did they help?", and "Why did you want to acquire Paxlovid?".

We took fieldnotes during our investigations on various social media platforms, Internet-based hospitals, and online communities. Fieldnotes are the researcher's understanding of what is occurring in a given moment in a given field site as both description and as "feelings, reactions, initial interpretations, speculations, and hunches" [76, p.9]. This can be considered interpretative and a form of preliminary data analysis. After initial fieldnotes, we wrote memos which serve various functions but are further and more significant interpretations of the research as it is conducted [27]. These can be in-process memos to explore emergent ideas, a research diary memo to unpack personal reflections, methodological memos to elaborate on collected data and modes of analysis, and more [55]. For instance, during the memo-writing processes, the second author reflected on particular terms and phrases that would elucidate themes in our data analysis process while the first author considered the multiplatform movement of Paxlovid that would surface in greater detail during further analysis. In instances where personal identifying information was present (names, addresses, etc.), it was either removed outright (in the case of addresses or phone numbers) or anonymized (in the case of names).

### 4.2 Data Analysis

We coded by using grounded theory techniques [16]. We first analyzed a sample interview initially through open coding to familiarize ourselves with the data and its concepts. The authors each individually coded the interview. Each sentence within our sample interview could be coded multiple times—for instance, "I feel this policy didn't make sense at all" was coded by one author as "confusion", "state policy", and "negative". In a similar fashion, we coded sample fieldnotes, as an exercise to generate potential codes and to familiarize one another with the data we had been collecting separately. For instance, a Xiaohongshu user mentioning relief after finding Paxlovid was coded by one author as "relief", "emotion", and "positive". After each author coded the sample interview and fieldnotes, we discussed our codes and why they felt appropriate. We memo-ed this interaction for posterity. In this round of coding, descriptive codes emerged, such as "anxiety," "healthcare," and "medical resources shortage," here trying to holistically capture the feelings, materials, and motivations of the moment, including the affective motivations to acquire Paxlovid, the value of Paxlovid, and important context.

After this round of open coding, we had a list of agreed-upon potential codes. We then re-coded the sample interview, an additional interview, and the answers found in the blank space left for additional comments in our Qualtrics form. After this process, we discussed our use of the

codes, investigated conflicts within the coding process, and iteratively revised our codes. At this point, we began organizing a more official codebook. Within the codebook, we had a name for each code, an abbreviated form used within the coding process, a definition for the code, and a theme that it fell under. For example: "False Information", "FAL", "When participants gave/were given false information in the process of acquiring Paxlovid", "Fraud/Scam". In all, fifty codes were placed into ten categories: COVID; Emotion/Affect; Fraud/Scams; Government; Information; People/Community; Process; Supplies; Treatment; and Other. These themes helped us structure our findings. For instance, codes that fell under COVID and Emotion/Affect became section 5.1 "Reasons for Paxlovid Acquisition"; Process, Treatment, and Information became section 5.3 "Solutions to Obtaining Paxlovid in China"; and Fraud/Scams became "Gray Markets on Social Media Platforms". With this new codebook, we split the coding work in half, with weekly meetings to discuss our initial findings.

Additionally, we conducted a critical discourse analysis of 1) news articles related to Paxlovid and its distribution in China, 2) government documents and documents from Chinese state-owned enterprises such as Genertec Meheco, and 3) corporations' reports and news articles such as Pfizer. The first author sampled 34 articles and investigated Pfizer's corporate news and English-language Paxlovid information, while the second author sampled 21 Chinese news articles and investigated Chinese government guidance and notices from the National Health Commission, National Healthcare Security Administration, Ministry of Health Emergency Response, along with Genertec Meheco agreements with Pfizer. Through critical discourse analysis, we coded transcribed articles as a way to "identify themes, consistencies, and patterns across and between texts and to connect these to wider contexts" [38, p.28]. This work accounts for much of our background section above. Overall, this form of data collection and analysis triangulates multiple sources of data, to account for gaps and validity [77].

### 4.3 Positionality

This research was conducted by two authors. The first author is a non-Chinese speaker, and, as such, certain interactions led to "communicatively ambiguous social encounters in the field" [1, p.10]. Although this language barrier foreclosed certain engagement opportunities for the first author, translation applications were used, and a constant dialogue was kept open between authors to support the investigation. As a non-Chinese individual, the first author acknowledges the failure of some U.S.-based inquiries into China that position the U.S. researcher as a knower/representer and the Chinese "subjects" into knowns/representeds [1]. It is their hope that this work circumvents this. The second author follows the feminist sensibilities to conduct ethnographic work with a sense of reciprocity [43] and aided in emotional and material support, as well as the presentation of medical resource information during the sudden zero-COVID policy change. As a Chinese citizen overseas, the second author's investigation of Paxlovid was also intertwined with her personal experiences of caring for her family and friends in China. The precarious feelings she encountered informed the initial research ideas.

## 5 FINDINGS

During the pandemic, everyday activities acquired new meaning. Previously simple acts like shopping for food became precarious and complex, while things understood to be stable were upended. By late 2022, our informants in China described feeling "fatigued" by restrictions that felt "endless." Suddenly, in December, what was once endless came to an abrupt end. Informants described feelings of confusion. Qin, based in Nanjing, China throughout the zero-COVID measures period, felt both "free and scared" in equal measure. They continued, "[I] felt that three years being quarantined was such a joke if the restriction rules [were] loosened overnight, not gradually". Li

put it differently, portraying the change as a split in state thinking: "Before Omicron: Don't open up, Western governments want money and don't care about lives. After Omicron: Hurry up and open up, I want money and don't care about lives." Overnight, COVID-19 itself, not measures and restrictions, took hold of the public imagination, and instead of groceries, medicine was in short supply.

Our findings follow the acquisition of Paxlovid by Chinese citizens both at home and abroad after China's zero-COVID policy measures were rescinded. In this moment, individualized response to the pandemic became the predominant method of staying safe. As such, the antiviral medication Paxlovid was acquired by individuals for diverse reasons. Below, we first attend to the reasons why individuals wanted Paxlovid. After, we illuminate the ways in which Paxlovid was acquired through multiple channels and the difficulties therein in China and abroad in the U.S. We do so to provide a full empirical account of a moment of crisis, from the perspective of our informants and supported by our online ethnographic work. Finally, we investigate how social media platforms mediated communications, investigations, and alternative markets dedicated to medicines like Paxlovid. On these platforms, individuals attributed different meanings and value to Paxlovid. Investigating this moment of crisis from the perspective of individuals' lived experiences is critical to understanding how an imaginary—like China's imaginary of self-sufficiency and community safety through state care—can inform individual and collective perception, affective states, and precarity.

### 5.1 Reasons for Paxlovid Acquisition

Public discussion on Chinese social media described Paxlovid as a "specific medicine" (特效药*te xiao yao*) for COVID-19, a Chinese phrase that implicitly indicates two layers of meaning: Paxlovid is a specific kind of treatment for infection and that it works effectively. Given the heatedly discussed effectiveness of Paxlovid on social media, below, we uncover two main reasons for Paxlovid's acquisition. Individuals intended to acquire Paxlovid for themselves or their families, either to 1) treat those who were already infected or 2) keep the medicine for future use. In this section, we highlight the feelings surrounding Paxlovid to show that it was more than a material medicine to combat COVID-19, it was also an affective object onto which feelings of hope, care, and security were embedded in a moment of crisis.

*5.1.1 Paxlovid: a medical treatment.* As an antiviral medicine—and one proven to be effective in helping avoid severe symptoms and lower both hospitalization and mortality rates—Paxlovid was desired as a medicine for those who were sick or with sick family members. On Chinese social media platforms, discussions concerning Paxlovid began immediately after the end of zero-COVID policy measures. The platform Xiaohongshu, in particular, was used to gather user-posted stories of the acquisition and use of Paxlovid among sick family members. Chao, based in Hangzhou, China, wrote on Xiaohongshu to record her 96-year-old grandmother's use of Paxlovid. Chao disclosed many details about the use of Paxlovid in her post from December 27th, 2022, the third day since her grandmother tested positive with a severe infection in both lungs. Chao's grandmother took three yellow pills in the morning and three blue pills in the evening, according to the instructional leaflet in the box that she showed in her posting. Chao cautioned that the pills were rather large and hard to swallow, but they should not be chewed. She provided friendly tips for potential users that the pills were very bitter and that a piece of candy afterward might help to soothe. Chao's Xiaohongshu postings showed that her grandmother gradually recovered after finishing her course of Paxlovid. In the comment area of her posting, the most liked comment echoed Chao by narrating their father's recovery after using Paxlovid, reading, "This medicine is very very good. Thanks to Pfizer." Paxlovid was noted on social media as a necessary and desired medicine for individuals at risk of severe infection or hospitalization.

*5.1.2 Paxlovid: an affective object.* Many individuals looking for Paxlovid were not looking for medical treatment in the present. Paxlovid acquisition was often perceived as providing future security rather than medical treatment. People with this perception tended to acquire the medicine for themselves or for their family members, especially older family members, such as grandparents with potential comorbidities and health concerns. Having Paxlovid ready for future usage seemed an effective strategy for future safety: Mi used the term "anti-anxiety pills" (定心丸*ding xin wan*) to refer to Paxlovid. "Anti-anxiety pills" here suggests the pills pacify one's nerves; once you acquire these "anti-anxiety pills" as she described, you will feel peaceful, without worry—as if someone is supporting you. Mi, going to college in Michigan, ended up asking her friend to take the Paxlovid she saved back to Beijing, where her family was struggling to adjust to the loosening of pandemic restrictions. As of our interview, nobody in her family had used the medicine. However, to Mi, the existence of Paxlovid at home somewhere made her feel less anxious.

Ethel, based in Shanghai, China and working in the finance industry, used "buying insurance" (买保险*mai bao xian*) to describe her acquisition of Paxlovid. She managed to order the medicine from the Internet-based hospital Meituan, a service platform embedded in WeChat's "sub-application ecosystem", after reading many "medicine snatching strategies" (抢药攻略*qiang yao gong lue*) shared on Xiaohongshu.[4] The 2,200 RMB ($320) price-tag was not cheap, but the Paxlovid was for her grandparents. By the time of our interview, the medicine she bought was still unused, in the medicine cabinet of her grandparents' home. But Ethel did not think she wasted her money, instead: "[I]t's like buying insurance: I hope they don't need to use it—that means they're all healthy." Here, Paxlovid is meant to provide future protection if need be, a means to avoid some risks, and a way to mitigate some concerns.

The way that Paxlovid was considered an "anti-anxiety" medication in its potential to help vulnerable family members or as insurance for future difficulty spoke to the significance of family in many attempts at acquisition. Family was at the center of many conversations about Paxlovid. This was especially true of individuals abroad, who watched as China's policy reversal led to widespread infection. There was nothing to do but watch, as per informant Ying living in New Jersey: "When I heard about the reopening, I was afraid for my families' health and kept scrolling through news about China to see how the situation would play out." The acquisition of Paxlovid abroad and the shipment back home was an affective extension of care at a distance.

### 5.2 Channels to Paxlovid in China

At the time of our investigation, Paxlovid was available through prescription by medical professionals in both U.S. and China. However, the failed negotiation between China's NHSA and Pfizer confounded the availability of Paxlovid in China, as discussed in the Background section. In China, the methods of acquisition varied, with difficulties and solutions changing frequently from December 2022 to January 2023. At particular times, one method of acquisition would work better than another. Below, we investigate these methods of acquisition while noting that, regardless, acquisition in China felt appreciably different than in the U.S. This variable availability informed individuals in both China and the U.S. For instance, U.S.-based Ying had a "weird feeling" knowing that it had been easy for her to acquire Paxlovid during her infection: "After I knew the difficulties of getting a box of Paxlovid in China, I felt bad...", noting how social media posts detailing these troubles amplified this feeling.

In early December, not too long after the policy change, private hospitals in China, particularly in cities, that had foreign proprietors became one option for Paxlovid acquisition. Elin, who lived in Shanghai, helped her grandfather get a Paxlovid prescription. She learned from her nurse friend

[4]See Appendix A—WeChat for further explanation

that United Family Hospital (和睦家医院*he mu jia yi yuan*) could provide Paxlovid. United Family Hospital is a franchised private hospital founded by American investors with seven hospitals in China, mostly in first-tier cities such as Beijing, Shanghai, Guangzhou, and Shenzhen. Following her friend's advice, she took her grandfather to United Family Hospital. Elin recalled, "Luckily, it was early. Not too many had COVID then, and we managed to make an appointment." At the hospital, the doctor checked his positive test results and went through his medical history. Ultimately, the doctor decided that he could take Paxlovid as a diabetic, one of the conditions that qualify a patient to use Paxlovid.

By mid-December, as more people were infected, the Internet hospital became a major channel to get Paxlovid, as it did not require the individual to travel.[5] Informant Huang lived in Hong Kong while her family members lived in the underdeveloped southeastern Chinese county of Fujian. From this distance, Huang was concerned about her grandparents and used social platforms as a way to uncover potential ways to help. She eventually discovered a way to get a prescription through the Internet hospital built into the shopping platform Meituan. She found this method through a thread on Xiaohongshu, with users posting the steps needed to acquire Paxlovid. Individuals looking for Paxlovid on Internet hospitals would have to first make an initial appointment to talk to an online doctor. Huang, like many people who mentioned the Internet-based hospitals, spent hours waiting in online queues, watching closely for available openings, and had failed multiple times to get an appointment within the time window. According to Huang, on Meituan, there were two slots daily, 9:30 am and 7 pm, to talk to an online doctor for a Paxlovid prescription, which was only valid for 16 hours. After obtaining the prescription, one needed to finish purchasing Paxlovid before 10 am or before 8 pm on the same day they obtained the prescription; if the transaction was not successful, one could try it again another day. Similar to seeing doctors in person, the Internet hospital also asked patients to provide positive test results, a challenging request for those that wanted Paxlovid for future use.

Finally, community hospitals became a popular method to get Paxlovid in early January 2023. Community hospitals served relatively smaller neighborhoods and were found in both urban and rural areas. Despite limited resources, Paxlovid was distributed to some prioritized community hospitals in both urban and rural areas in Beijing and Shanghai, and then, later, to other areas [7] amid waves of infection after the zero-COVID policy reversal. Doctor Zhang Wenhong, a social media public figure during the pandemic, suggested that community hospitals were critical to combat medical resources shortage [62]. On Xiaohongshu, users posted their stories of Paxlovid acquisition from community hospitals. These posts constituted a pool of information: how to get into community hospitals, which community hospitals may have Paxlovid, and what documentation would be required to bring.

### 5.3 Solutions to Obtaining Paxlovid in China

*5.3.1 Navigating the difficulties of acquiring Paxlovid.* Stories of Paxlovid acquisition were often fraught with struggles concerning multiple requirements and documentation. One informant described the lengths their father went to get a Paxlovid prescription at a local community hospital in Minhang District, Shanghai. The hospital said to acquire Paxlovid, their father had to submit as necessary documentation positive test results through a PCR COVID test, x-ray scans of the lungs, a CT scan, and liver and renal function reports. Social media posts suggested that, because of limited supply, hospitals placed increased importance on providing documentation—especially documentation of being "high risk" for severe COVID-19 symptoms. Even after such steps, some

[5]The term "Internet hospital" refers to Chinese telehealth systems that are often connected to offline medical institutions. For more information, see: [32]

Xiaohongshu posters noted that community hospitals would ask patients to take their Paxlovid pills in front of a doctor or nurse, as proof of treatment and as a guarantee that the Paxlovid course would not be kept and re-sold elsewhere.

In cities, shortages of medicine led to "panic buying" and pharmacies with empty shelves. People who were in need of medicine urgently relied on alternative means to get by. For instance, informants used "flash delivery" (闪送*shan song*), an ad-hoc city-wide delivery service that promises to pick up the desired items from a user within ten minutes. The flash delivery service guarantees delivery within a given window of time, directly from one user to another user or designated place. Informant Izzie, who was located in Shanghai said, "My friend used flash delivery to spare some fever reducers for me. My three-year-old daughter had a high fever that night, and there was no medicine for her at home nor in pharmacies." Similarly, posts on Xiaohongshu recommended using flash deliveries for the movement of Paxlovid from home to home, minimizing the movement of users during an unsafe time. This kind of ad-hoc service provided a sociotechnical solution to "panic buying" emergencies on the ground. When medicine was not available for purchase, informants relied on shifting and trading medicine between and among friends and families.

*5.3.2 Acquisition difficulties had affective consequences.* For Izzie, her difficulties were not only medical resource shortages but the emotional fallout from their prolonged acquisition. Izzie and her family had to prove that Paxlovid was indispensable for their 103-year-old grandfather who was experiencing severe COVID-19 symptoms. Izzie recalled that her grandfather was transferred by her family from one hospital to another because the former rejected their request to prescribe him Paxlovid. The doctor suggested it was meaningless to use up a course of Paxlovid on her grandfather because many older adults cannot survive the illness.

At the second hospital, doctors delayed the prescription of Paxlovid to determine whether Paxlovid was a must. It was during this period that Izzie's family felt it necessary to take matters into their own hands. During our interview, Izzie noted the "dirty trick" (阴招*yin zhao*) that her family came up with: "Someone in my family lied to the doctor that he worked at the public health bureau, and he threatened the doctor that he would report back about the doctor's inaction if not prescribed Paxlovid." The trick worked, and Paxlovid was prescribed, but it was already too late: her grandfather had passed away. The loss of her grandfather was not the only death Izzie had experienced: four older adults in her family had passed away by mid-January 2023, right before the Chinese New Year. In our interview, she used the term "bank run" (挤兑*ji dui*) to describe the cause of her grandfather's death. She said, "It's just that there are too many people [getting sick] [...] COVID didn't take his life. He died due to the medical resource 'bank run' [that was] caused by COVID."

Here, Izzie recalled stories of bank runs, a term to describe a panic sparked by a mass withdrawal of money on the fears of institutional collapse. In China, this term had been appropriated by state discourse to discourage panic buying [100]. It seemed to Izzie that panic buying was responsible for the death and turmoil her family had experienced, alongside the speed of policy change and lack of preparation, which she called "ridiculous". In our conversation, Izzie attempted to process her feelings—anger, bitterness, sadness, helplessness—by situating her grandfather's difficulties of receiving Paxlovid in a larger network of frustrations.

*5.3.3 Paxlovid and trans-border acquisition.* Within China, citizens had material difficulties in their acquisition of Paxlovid. For citizens abroad, difficulties arose when they made attempts to ship Paxlovid back to China, to support their families at home. Jing provided a vivid description of how she shipped Paxlovid back to China from Seattle through the United States Postal Service (USPS). The United States Postal Service is an authorized shipping service provider for the transportation of prescriptions on the condition that 1) the medicine is sent to the appropriate patient with

appropriate prescription 2) the sender is a pharmacist or medical provider. However, the Paxlovid was not being sent to who it had been prescribed to and Jing was not a pharmacist or medical provider. Prepared to face a potential check from USPS service representatives at the post office, Jing disguised the Paxlovid as chocolates. She took the pills out of the packages and wrapped them with the original thin plastic package of chocolates, next to some real chocolates.

Jing confessed she was afraid of packaging her legally-acquired Paxlovid to ship to China because it was against the law to send Paxlovid into China, but she said, "It's better than seeing your family sick and dying and doing nothing." She tracked the package as it made its way to China. It took 10 days for the package to reach Beijing customs. Between January 7th and 22nd, the tracking information never changed. When we spoke, Jing complained about the medicine's long stay in Beijing; she had read about shipments of fever reducers and cold medicines being checked at Chinese customs. The package finally arrived to her parents on January 28th, 31 days after she sent it out from Seattle. These mixed feelings—of hope, fear and relief—all happened as the Paxlovid traveled across borders, as Jing watched from her computer, the information updating in fits. Within a gray area of legality, these shipments were undertaken in the hopes of helping families in the present and future. Below, we consider the acquisition of Paxlovid from gray markets, where legal acquisition was not necessary and Paxlovid was available—for a steep price.

### 5.4 Gray Markets on Social Media Platforms

As noted above, various difficulties in navigating, for instance, the requirements for acquisition in a Chinese hospital or the potential transnational shipping from the U.S. to China, created difficult situations and feelings. Amid these mixed emotions, some individuals encountered potential Paxlovid through gray markets on social media platforms.[6] In this section, we discuss these gray markets of distribution, their various actors, and the ever-present potential to be scammed.

*5.4.1 Sites of gray market.* For Paxlovid, the visible gray market was centered around social media platforms, with final deals struck over private messaging or mobile payment services. Via one group: "payment is made via Paypal (family and friends) and cryptocurrency only, for the security of both parties". Platforms used to attempt acquisition and information spreading included both U.S.- and China-based platforms, including Facebook, Twitter, Telegram, WeChat, Xiaohongshu, and Weibo. These disparate platforms speak to the dispersion of individuals looking to acquire Paxlovid and the different locations in which Paxlovid was readily available. For instance, Facebook was a site on which to find generic Paxlovid from India, such as Primovir. The name-brand Paxlovid box from Pfizer proper features a white box with a crescent of blue and red carved from its left side; on Facebook, the Primovir box, with its green and red orb in the lower right corner, was more common.

It should also be noted that individuals' attempts to acquire Paxlovid were not situated within a single social media site but, instead, conversations on one platform would link to conversations on another platform, information contained in one space would be informed by information elsewhere, and dealers would advertise their Paxlovid on one platform while selling it on another. In this way, different sites of potential acquisition were in dialogue with one another, interactions migrated, and one's search never ended where it began. The connection among multiple platforms also goes across the boundary of countries and language barriers. For instance, a post on Facebook features a hand holding two boxes of Paxista, another Indian generic brand Paxlovid. Behind the hand, a cardboard box filled with Paxista stacked three wide and five deep. In the comments, a potential

[6] A gray market is a market where products are sold outside of authorized distribution channels in which products are sold or resold in a manner not sanctioned by the manufacturer—here, for instance, Paxlovid is being sold in ways not intended by Pfizer

buyer inquires as to the price. The original poster responds with a QR code that, when scanned, leads to a private Chinese WeChat account.[7]

*5.4.2 Actors within the gray market.* Here, we unpack two kinds of actors within the gray market for Paxlovid: scalpers and scammers. We differentiate between the two kinds of actors and demonstrate how they are situated within the gray market network. This speaks to the prevalence of questions and comments regarding trust on sociotechnical gray markets. Individuals hoping to buy Paxlovid on the gray market did not know who to trust and certain gray market dealers went out of their way to appear trustworthy. Below, we unpack these findings.

*Scalpers.* Scalpers, rather than considering themselves opportunists hoping to gain a fortune during a chaotic moment, painted themselves as heroic, claiming integrity and reliability. Scalper A'Tong used his WeChat Moments (朋友圈*peng you quan*—a posting function in WeChat) as a space to build his credibility. On his WeChat Moments, in addition to photos of piles of Paxlovid and some academic research papers on the effectiveness of Paxlovid, A'Tong called himself a "Hard Currency Hunter" (硬通猎人*ying tong lie ren*). He used this term to show that he sought resources (Paxlovid) in the "primary market" for average folks who did not have the means to find these resources on their own. He claimed not to exacerbate the "bank runs" that caused shortages in the "secondary market" with individual consumers who truly needed Paxlovid. A'Tong did not avoid disclosing his identity as a scalper. He directly wrote and highlighted the phrase "gray market" (黑市*hei shi*) in his postings and argued for the legitimacy of its existence based on supply and demand relations. It was a necessary space that opened up availability, making difficulty through legal channels less worrisome. He claimed that his "connections" with medical companies that purchased Paxlovid from Pfizer directly guaranteed the authenticity and quality of the Paxlovid he sold. His self-proclaimed name of "Hard Currency Hunter" added a hint of heroic sentiment to his scalper's identity, making him almost like Robin Hood or one of the 108 heroes in "Shuihu Zhuan" (水浒传*shui hu zhuan*)—a rebel fighting the good fight in a time of turmoil.

Similar to A'Tong, another scalper A'Kai told the second author that his entire goal was not to seek fortune, especially when the infection rates were already trending down from their extreme highs. A'Kai said his work in the gray market was "not to deceive others into buying medicine unnecessarily"—he would rather "throw medicine away" than deceive his clients. A'Kai had his own way of understanding his business and its place within the hunt for Paxlovid and a China post-zero-COVID policy: "Whoever they are, scammers, doctors, or me, we only want to live a better life." For A'Kai, he was one of many people living precariously, trying to get by.

*Scammers.* As opposed to scalpers, scammers sell either counterfeit or nonexistent Paxlovid in the gray market. Scammer hid in plain sight, often on popular social media sites. For instance, on Facebook Groups related to Paxlovid was a mix of English-language discussions about the experience of Paxlovid symptoms ("How long before the bad taste goes away?") and bilingual discussions concerning the buying and selling of Paxlovid. These buying and selling conversations were most often short. For instance, a post with Paxlovid boxes has a one-word caption: "Ready?" Its two responses: "Yeah." and "two boxes?". Here, what is visible on the public-facing Facebook page offers a hint at conversations happening in Facebook's private channels.

Often, scammers did not use clandestine or anonymous profiles but instead falsified a medical background. Profiles that offered Paxlovid featured professional photographs of Asian men and women in doctor's attire, medical scrubs, or business suits. Their posts were frequently bilingual,

[7]Please see Appendix B for some examples of multi-platform movement in the gray market, taken from our ethnographic memoing.

in both Chinese and English with the Chinese text often mechanic, like machine-translated text. For instance, a 'Dr.' with a stethoscope around her neck posted,

> *New stock (Paxlovid authorization valid for 2024) is scheduled to arrive tomorrow morning. The last box of Paxlovid Medication (expires March 2023) is still available for only $2,200. Order and pre-order new inventory immediately before it is done (expires 2024).*

The post included a QR code which, when scanned, took the individual to a Telegram group with photographs of name-brand and generic Paxlovid in boxes, trash bags, and envelopes. This particular Telegram group featured English and machine-text Chinese in its group name. Its most recent post was of a man in a mask holding two boxes of Paxlovid. He appeared to be either in a hospital or office setting with the usual prefigured drop ceiling tiles. The caption included a marketing tactic aimed at those who were searching for the medicine: "Do not hesitate to protect you and your family". Previous posts carried a similar tenor and were of Paxlovid or generic brand boxes, each post with hundreds of views.

If one scrolls enough through this Telegram group, one gets to a time before the reversal of the zero-COVID policy. Posts that state, "Paxlovid, Paxovir, Primovir, Bexovid Available" in Chinese and English are replaced with English and Spanish posts that say "Weed, DMT, Shrooms, Xanax AVAILABLE". Before the group became an exclusive gray market vendor for Paxlovid and its generics, it was a gray market vendor for drugs, prescription medication, vehicles, and, occasionally, guns. Per one post, "if you the type who come here talking about being ripped off already (...) you shouldn't be here. Meanwhile, we want to thank our loyal clients (...) Dm me for all deals." Below one Facebook QR link to Telegram, a sole comment: "scam!"

*5.4.3 Consequences of scams.* On January 2nd, China's Public Security Ministry issued a statement on the "illegal and criminal activity involving the production and sale of counterfeit epidemic-related medicines and related items" [3]. Warnings of scams and ineffective or improperly produced medicines abounded from both state officials and social media users. Here, we unpack the consequences of scams in three ways: monetary consequences, medicinal consequences, and affective consequences.

First, monetary consequences. Through desperation, the price of Paxlovid increased by thousands of dollars. And oft-quoted price in news articles was $7,313 with prices on sites like Telegram ranging from $500 to a few thousand dollars. For some individuals, the cost was worth it and they got what they wanted. For Li, they paid "3500 yuan per box, very expensive, [but] I choose to bear it." They were rewarded with Paxlovid. However, the possibility of paying for Paxlovid and getting nothing in return was great. Individuals discussed their waiting in vain. One news article highlighted a scammer on Weibo who had deceived at least 30 people—these individuals then formed a group chat to organize group retribution [98]. Those who had been scammed often returned to the site of the scam to warn others. For instance, one Facebook user copy-and-pasted his same warning to each new post offering Paxlovid: "Don't pay directly, you must use guaranteed transactions, those who ask for direct payment are liars, [I] have just been cheated."

Second, medicinal consequences. As noted above, some individuals looking for Paxlovid ended up waiting indefinitely for their shipments to arrive. In this way, those that had been scammed out of their shipments of Paxlovid faced monetary consequences. However, even those that acquired their Paxlovid from the gray market were not sure if what they had acquired was truly Paxlovid. Some social media posts questioned the chemical composition of the shipment they had received, citing government missives about the safety of supposed shipments of generics into China. The gray market's nature as in-between legality made the possibility of fake medicines real.

Third, affective consequences. The precarious nature of gray market acquisition led to affective consequences. As discussed by Ying,

> *At the very beginning, we noticed at China's Internet hospitals [they were] selling Paxlovid, but very soon it was not allowed to sell it. After that, we tried to ask friends to see if there was any Paxlovid available on the [gray] market, but soon we gave up because no one knew how to spot the differences between the real and the fake. So we decided not to buy any Paxlovid.*

As noted here, the promise of the gray market, as highlighted by A'Tong, was an availability unmatched through legal channels. However, the frequent posts warning about scams, the news articles highlighting the individual loss of hundreds, if not thousands, of dollars, and the inability to know if Paxlovid acquired through the gray market was real led individuals to be too nervous to proceed. Certain groups made for the express purpose of selling Paxlovid seemed desolate, empty except for multilingual offers for generic Paxlovid at heavy markups. Certain groups would not allow posting, some would not allow copying of content ("sorry, copying from this channel is disabled by its admins."), and some links would lead to profiles that were up one day and gone the next. Taken together, there was an uneasy feeling among individuals searching on the gray market. For those that did acquire Paxlovid through gray market networks, the open question of whether or not the medicine was real remained.

*5.4.4 Reclaiming safety.* As stated above, Pfizer manufactured Paxlovid and allowed for its generics to be manufactured for low to middle-income countries. Meanwhile, Merck developed the generic molnupiravir and authorized a voluntary license even before Pfizer's MPP agreement, which gave the opportunity to medical companies in low to middle-income countries to manufacture molnupiravir [68]. Amid the sudden policy change in China and people's desperation regarding Paxlovid, those generics made in and for low- to middle-income countries surfaced on the gray market. Both authors encountered pictures of, for instance, Paxista and Primovir, Paxlovid generics, on social media platforms. However, the veracity of any medicine on the gray market was questioned by users and the state alike. Yin Ye, the CEO of the Chinese genomics company BGI Group wrote on Zhihu, "In the current situation where it is difficult to buy original drugs, one should be extremely careful when selecting COVID-19 generic drugs", citing a case where Primovir turned out to be Oseltamivir, an antiviral drug but one used for flu viruses.

In such a precarious environment, more labor was required from individuals to discern what was true and what was not, what Paxlovid seemed real and what did not. In a time of crisis, when safety was already scarce, people relied on themselves to reclaim a sense of safety. Social media platforms were a space where people collectively shared information regarding their experiences navigating potential traps of falsified medicines. The first author encountered shared links on Facebook and the forum-based website Zhihu, warning people about the falsified Primovir. Here, widely shared articles about inconsistencies in generic brands and their manufacture of Paxlovid alerted individuals to avoid certain sites and brands of generic Paxlovid. Another post on Zhihu used liquid chromatography to test the chemical components of Primovir pills. For the initial poster, their Primovir contained no nirmatrelvir, the critical component of Paxlovid. Such posts gained major traction, with commenters worried about their own shipments. In response to citizen science attempts at testing gray market Paxlovid, Yin Ye and BGI Group announced on WeChat that they would be willing to test anyone's generic Paxlovid to ensure its authenticity. Here, whether or not to send your hard-earned and expensive Paxlovid to be tested for authenticity became another problem, an additional issue in a long line of issues.

# 6 DISCUSSION

## 6.1 A Shift in the Chinese State Imaginary

To summarize, at the start of the COVID-19 pandemic, the Chinese government placed strict policies on travel, testing, and tracking. These efforts were taken together as a zero-COVID policy that implied that collective safety could be maintained so long as each person followed these policies. This imaginary of collective safety was cultivated to support hope and stability: future safety required active participation in present measures and could only be guaranteed if all Chinese citizens joined in. When the zero-COVID policy measures were abruptly abandoned, so too was this imaginary of present and future safety. A new form of work had to be undertaken, one that, as state media suggested, put the individual in charge of their own safety [95]. Below, we discuss this shift: in keeping with CSCW literature, we consider the state imaginary as a collective form of anticipation work. We focus on changes in the state imaginary, from a collective feeling of safety to an individualized precarity. We highlight how the state imaginary interpellates social roles, corporate responsibility, and affect, as well as precarity and alternative practices (as in the case of gray markets) [2]. In doing so, we discuss one scale of anticipation work in section 6.1, prior to examining more closely anticipation work on an individual scale in section 6.2.

We can see state policy during the pandemic as forming a sociotechnical imaginary. Such an imaginary, according to Jasanoff and Kim, is built on "imagined forms" of social life and order that are centered on large-scale "scientific and/or technological projects" [37]. The imaginary has been discussed as an indirect power, understood by citizens through an intensity of feeling contingent on affective governance techniques used to alter public feelings and inform public action [96, p.18]. Zhang reminds us that disasters reinforce certain aspects of political and social life and can construct affective nationalist narratives out of collective grief, being moved by acts of unity and heroism, and, in this case, enmity characterized by competition between China and the West [101]. The Chinese national project to contend with COVID-19—"controlling and caring" at the same time—is understood as being affective [101, p.8].

To materialize the imaginary and channel affect into physical safety, the state project required collective anticipation work—the leveraging of this imaginary in the present to support present-day collective action that confirms an imagined future [2]. During zero-COVID, China set itself apart as a unique state with limited transmission rates that were predicated on state care, collective safety, technological innovation, and independent development of COVID-19 vaccinations and antiviral medications. The large-scale project of keeping citizens free from COVID-19 was a collaboration between citizens and state and even citizens who felt ambivalent to the greater project and its restrictions contributed [12]. As part of this collective anticipation work, for instance, private Chinese companies developed nucleic acid amplification tests, Sinopharm vaccines, and the Azvudine antiviral medication—large-scale sociotechnical projects [44]. Elsewhere, the state informed the creation of imagined forms of social life through media and state discourse and citizens maintained a sense of stability through everyday actions [12]. In these and other instances, collective action informed the state imaginary of China as self-sustaining, scientifically independent, COVID-free, and capable of developing and distributing its own vaccines and antiviral medicine in spite of global tension.

A shift in this Chinese state imaginary came with the abrupt end of zero-COVID, the increasing transmission of COVID within mainland China, and a failure to articulate a new national plan or anticipate contingencies, like the necessity for medical resources. Such a failure to articulate this shift triggered both affective and material precarity—confusion, speculation, and anxiety, as well as a lack of resources and services—and labor in individuals who took it upon themselves to find safety for themselves and their loved ones. For our informants, the imaginary of collective safety

and self-sufficiency broke when zero-COVID policies were reversed, seemingly out of nowhere, and medications were scarce. Informants tried to make sense of this change. Some informants could not understand the abrupt shift in state thinking. For instance, recall Li's remarks on the arbitrariness of the decision. Li's satirical comparison of the stark shift in Chinese state thinking before and after the zero-COVID policy measures marks a rupture in an imaginary of stability and an attitudinal shift away from collective governance. A new frustration emerged that was built upon previous frustrations with zero-COVID policy measures—an additional layer of frustration predicated on the futility of the past mode of collective safety. Recall Qin's declaration that the past three years were, ultimately, a "joke".

Other participants noted their confusion during this transitional moment, unsure of who or what to trust. Posts on platforms such as Xiaohongshu attempted to navigate between advice and misinformation and disentangle past government policy from present policy [36]. In search of a vocabulary to describe the unfolding events, informants used state discourse and metaphor to make sense of changing policy: we have shown that some of our informants leveraged the economic term "bank run" to describe the shortage of medical resources. Others were reluctant to comment on how they felt about the change in policy or the politics and medical infrastructure that limited Paxlovid. This reluctance to explicitly reflect on the politics and policies that support a collective Chinese imaginary has been noted by Wallis [92], who found that young Chinese individuals in the cultural creative industries often claim they are not interested in politics. This deference can be seen as an intentional shift from the risk of explicit politics to a more generalized concern "about social issues" [92].

It should be noted that in this case, informants did not necessarily want a return to zero-COVID policy measures—zero-COVID policies were not necessarily preferred over the "ten new measures" that placed individual responsibility above state care and collective response. Recall informants who called living with zero-COVID policy measures "exhausting". Also recall the public outcries and ambivalence towards zero-COVID policy [10, 24]. As such, this is not a story of "repairing" the past, a distinction noted in previous CSCW work [41]. With an imaginary of collective safety broken, both the recent past and the present were precarious, motivating individuals to anticipate a future they had to construct for themselves. Foregrounding such affective and material precarity, and the ensuing labor, provides a way to uncover alternative practices, conceptions of safety, and new imaginaries as an official state imaginary became untenable. Rather than hoping for a return to collective safety, there was a general orientation towards a form of safety predicated on individual acts of anticipation work. These acts were undertaken to support those most impacted by the disruption of collective safety—older adults and those with preexisting conditions. Recall participants like Izzie, who criticized a "lack of preparation" at the national level to deal with impacts on individual health and well-being while navigating bureaucratic ambivalence towards the safety of her grandfather. In these precarious moments, we can see how a previous orientation toward collective action, and an imaginary of stability built upon collective anticipation work, was upended and replaced with individualized practices. If this shift creates lasting change to the Chinese state imaginary remains to be seen. Either way, participants like Izzie continue to feel the resultant loss.

### 6.2 Friction Between Individual and Collective Anticipation Work

In our research, the abrupt reversal of zero-COVID policy measures created a moment of crisis in which initial anticipations of future safety were disrupted. Individuals could no longer assume a collective safety against COVID-19. In its place was a vacuum—there were few actionable state-based solutions to this newfound precarity and the guidance that did exist requested citizens act on self-interest. As such, our informants acquired medications like the antiviral Paxlovid for two

reasons: to combat current illness in the present or for speculative use in a potential, presumed future. The latter can be considered anticipation work, the "management of [future] uncertainties" through speculation, characterized by "what if" reasonings that inform present practices [26]. In this process, social platforms were critical mediators that provided affective and material possibilities in the quest for safety and to anticipate future needs.

In previous CSCW work, anticipation work is often considered a collective practice, one undertaken by individual actors united in collaboration. According to Steinhardt and Jackson, "anticipation work is an important mechanism by which individual futures get (re)calibrated to the formal and evolving shape of collective plans" [83, p.450]. As this passage suggests, individual speculation on future uncertainties becomes aligned with collective action—they co-construct and inform one another. This is aligned with CSCW's focus on coordination, mediation, and facilitation of collaborative interactions, research in which technological systems are designed to support [13]. As noted by Ciolfi et al., CSCW is united in "incorporating models of coordinative practices in computational artifacts and to do so in such a way that actors are able to deal with contingencies and are supported in that by the functionalities of the computational artifacts" [14, p.8]. In our current research, we can see individuals partaking in individual anticipation work that is undertaken in collaboration with one another. For instance, within Clarke, anticipation work is done in cycles of reasoning, information gathering, and testing [15]—in our work, social media platforms facilitate our informants' information gathering, testing of information, and sharing strategies. Recall informants Chao, Mi, Huang, and Ethel who each posted, searched, and shared on Xiaohongshu and utilized step-by-step instructions to acquire Paxlovid through Internet-based hospitals. Such moments were predicated on individual speculation (i.e., according to informants like Huang, *My grandma might need this in the future*) and informed by collective experience available for consumption on social platforms (as when Huang read through Xiaohongshu posts for specific information as to how to acquire Paxlovid without a prescription and without being sick).

However, as Steinhardt and Jackson continue, individual anticipations can "contradict" one another or the greater collaborative project [83]. Here, we highlight the friction between individual and collective anticipation work during crisis, in an effort to extend Steinhardt and Jackson's consideration of contradictions within collective anticipation work. Within our research, informants felt moments of precarity as zero-COVID policy measures were lifted and COVID-19 numbers increased. It was imperative to anticipate future illness, and to acquire medicine for a speculative future in which Paxlovid would be necessary. Often, this was done in support of one's older or vulnerable family members—a "moral imperative" [2]. Despite a similarity in inciting incident and affect, anticipation work was ultimately undertaken in different, sometimes contradictory, forms. Informants such as Izzie went through legal channels, expecting this to be the most effective and expedient form of acquisition. Informants abroad flaunted customs with doses from the U.S., hidden in mundane packages. Individuals on Telegram waded through misinformation to find Paxlovid. Scalpers and scammers speculated on the anticipation work of vulnerable individuals, creating further precarity for the vulnerable.

Paxlovid was the object of anticipation work, the hopeful object of future safety in anticipation of future illness. Due to the limited supply of Paxlovid within China and the "bank run" panics that occurred in the immediate moments after the state's policy reversal, each individual fought for their portion of limited quantities of Paxlovid. Individuals were working towards a common goal that could not be achieved by every party, creating a situation in which individuals were necessarily at odds, despite coordinated efforts at particular moments and collective desires for safety. While users shared practices, tips, and stories via social media platforms and used the logics of given social media platforms to buy or sell medicine, individual anticipation work necessitated individual acquisition and, thus, adherence to the new state discourse: "Everyone is the first person

responsible for their own health" [95]. Below, we present two manifestations of these frictions between individual and collective anticipation work: an emergent gray market and a feeling of recursive precarity that mirrors anticipation work as ongoing and unfolding. We link these ideas back to CSCW, contending that examinations of collaborative work—especially collaborative work that focuses on politics and policy—often necessitate an emphasis on friction and affective or material precarity.

*6.2.1 Friction within emerging gray markets.* As noted in previous research, individual anticipation work can be "pragmatic" [83], and initially, informants discussed their pragmatic solutions to present and future precarity. For instance, Elin went through legal channels to acquire Paxlovid for her grandfather at an American private hospital in China. Elin noted that, in her case, it was early after zero-COVID policy measures were lifted, which may have contributed to her success. As more individuals began looking for medicine, it became harder to acquire Paxlovid—this was at least partially due to stalled negotiations between the Chinese government and Pfizer, as discussed in our background section. Manufacturing and distribution issues combined with exponential growth in the desire for antiviral medication forced individuals to abandon pragmatic solutions and legal channels in favor of riskier behavior. In this case, anticipation work in the form of medicine acquisition and additional desperation in the face of supply issues created an environment for *gray markets*. In this section, we highlight that, during this moment of crisis, small-scale and short-term gray markets evolved across social media platforms to support and take advantage of anticipation work. These emergent environments were not organized markets for collaborative work that repaired order and a sense of security. Instead, they were situated within slippery areas of law and regulation containing dubious information and frauds, stimulated by the scarcity of medical resources and the logics of social media platforms.

We have shown that alternative markets opened up on various U.S.- and China-based platforms, including Telegram and Twitter, WeChat, Xiahongshu, and Zhihu. We use the term "gray market" in accordance with previous work: gray markets are spaces where branded merchandise is sold "through channels unauthorized by the trademark owner" [8] and built upon demand from the consumer [35]. In the case of Paxlovid in China, we can see both the unauthorized sale of branded-Paxlovid and generic Paxlovid, with the blue and white of Pfizer's logo intermingling with green and red of generic Primovir. Often, these gray markets operated on multiple platforms and within circuitous logics, with public-facing pages of a social media platform used to advertise the availability of Paxlovid and final sales struck over private messaging or mobile payment services, with no proof of sale and undisclosed shipping procedures. For instance, consider that a sale that began on Facebook would, through a QR code scan, bring the buyer to private WeChat chats. Examples of these indirect routes to acquisition are listed in our appendix B.

These emergent gray markets were created by sellers practicing anticipation work in a way not dissimilar from their buyers. Whereas buyers were anticipating future illness in a precarious moment, sellers were anticipating future profit based on a speculative market of individuals searching for Paxlovid. As noted in previous CSCW research, anticipation work "design[s] pathways" into the future through present practices [83]. Here, sellers created alternative marketplaces on social media platforms to speculate on Paxlovid shortages and make returns on investment, practices that relied on the anticipation work of buyers. We can see how sellers on the gray market used precarity as a marketing tool, as in the Telegram post that urged individuals, "Do not hesitate to protect you and your family". Such calls from gray market sellers recall informant Ethel, who compared Paxlovid acquisition to "buying insurance". For Adams et al., anticipation work is the mitigation of risk: "Risk itself is a commodity, sold via insurance as a means to hedge against the future when one's life depends upon it, turning life into something one invests in through

anticipatory logics" [2, p.254]. Following this, sellers turned risks into a profitable business, and, in one sense, contributed to the making of safe futures, even if their identities and intentions appeared dubious to the public.

In these cases, the collaborative aspects of an interaction can vary. Take, for example, the seller A'Tong, who considered his position as a scalper to be akin to Robin Hood, using his connections to facilitate the acquisition of Paxlovid, mediating a complex network for individuals who cannot do so themselves. From the position of A'Tong, his anticipation work aligned with the anticipation work of his buyers: both on the lookout for a "better life" through Paxlovid acquisition—collaborative work supported by social media platforms [14]. However, the anticipation work found in the outwardly hostile methods of Paxlovid scammers could not be considered collaborative in the same way, despite its use of the same social platforms. Such scammers used desperation and shortage to speculate on others' individual anticipation work while securing returns in the form of money for themselves.

*6.2.2 Recursive precarity within a search for safety.* As noted in our findings, the zero-COVID policy reversal led to a crisis that occurred overnight, with the previously-abated possibility of illness now an immediate and future concern for individuals and their families. For informants used to the "endless" restrictions of zero-COVID policy measures, this moment in time was precarious. Individuals attempted to secure a feeling of safety through anticipating the need for medicine. As previous CSCW research has noted, such anticipation work is ongoing and negotiated [26]. Following this work, we consider the search for safety during crisis to be an ongoing effort characterized by *recursive precarity*, an affective state of discontinuity and insecurity that is distinguished by its repetition.

For many informants in our study, the search for Paxlovid inspired conflicting positions, misinformation, further anxiety, and a necessity for additional labor. The cost of future safety was a precarious present. Individuals like Huang spent hours waiting for an Internet hospital appointment that, once booked, produced a short window to meet and have a prescription filled. Jing spent 31 days worried that the Paxlovid she sent to her family would be taken by customs. For individuals purchasing Paxlovid via gray markets, trust was placed in anonymous individuals. Paxlovid seekers had to question whether profiles seemed legitimate or whether to listen to the comments deriding certain links as scams. They had to weigh the monetary costs of Paxlovid often at a steep markup or think hard about the legitimacy of less costly doses, before giving sensitive information like name and address to sellers. Upon purchase, individuals had to wait for their Paxlovid to be delivered—a wait that was indefinite for those scammed. If scammed, individuals then had to consider starting this work from the beginning.

We argue that anticipation work is an unfolding process in concurrent with ongoing precarity—as one goal is achieved, a new issue or complication arises. In our context, even when Paxlovid was acquired and material precarity was alleviated anticipation work was not complete. Individuals who were lucky enough to acquire Paxlovid in a community hospital setting were surveilled to make sure Paxlovid was not smuggled out. Informants who received Paxlovid via the gray market worried about its authenticity. Stories of Paxlovid boxes being filled with something other than nirmatrelvir and ritonavir were actively discussed on social media: videos of liquid chromatography tests coming up negative for nirmatrelvir were widely shared. In this way, despite the acquisition of Paxlovid, affective precarity remained. If anticipation work is based on speculation—"foreseeing different scenarios" [26]—some individuals questioned whether their medication was fraudulent and that if their Paxlovid doses were needed in the future, they would be giving loved ones ineffective treatments. Thus, a potential solution for precarity begets further complications that then require

further work. Individuals negotiated through ongoing present precarity for a hoped-for feeling of safety into the future, a feeling continually deferred.

We highlight gray markets and precarity for a number of reasons, both empirical and theoretical. First, such gray markets are one manifestation of a precarity brought about by state policy changes and international trade and manufacturing disagreements that are themselves manifestations of larger corporate and political tensions. In this way, we suggest that the qualitative study of politics and policy must be understood through their reverberations on the ground. As our background section traces the routes of the manufacture and distribution of Paxlovid and concurrent policy change, our findings trace the resultant affective and material precarity through the acquisition of Paxlovid. Additionally, we highlight these gray markets to consider the friction between individual and collective anticipation work within a computer-supported cooperative work context. In these gray markets, computational artifacts, like social platforms and mobile payment services, mediate interactions, facilitate transactions, and inform the flow of Paxlovid. Such platforms and services have been noted as aiding in "sense-making, communication, and collaboration during periods of disaster" [79, p.14]. In our context, interactions are sometimes wholly collaborative but sometimes, in the words of Steinhardt and Jackson, contradictory [83]. We highlight these moments of friction to add a social complication to literature that often focuses on infrastructural or technical difficulties. In doing so, we emphasize the need for research on computer-supported interactions that are, in one sense, collaborative, and, in another, incommensurable. In considering these interactions, we challenge the taken-for-granted assumption that collaboration is always desired [90, p.20].

## 7 LIMITATIONS

This work should be considered alongside its potential limitations. This research was conducted at a stressful time and participants in the study were in a precarious, dynamic situation. It was difficult to recruit for this research, and many participants did not want to divulge specific demographic information. This work tried to capture a specific moment in time—the immediate aftermath of an expedient reversal of years-long COVID-19 policy measures (for further work on this moment and people's shifting attitudes about the Chinese imaginary, see Zhang [101]). Our work is limited to the short-term impacts of this shift on the ground, as experienced by individuals in China and abroad. The long-term impact of this shift—and how this will influence Chinese citizens' feelings on active governance and the Chinese imaginary over time—remains to be seen. Future work could investigate how this rupture in the state imaginary and its manifestations (do not) persist.

Additionally, while an online ethnographic method affords unique possibilities, especially in the case of platforms (see: [84]), a more traditional ethnographic inquiry may have gathered further, or different, results. This research is focused on how platforms informed a moment of precarity and, as such, the online ethnographic method was deemed most appropriate. Finally, the majority of our study's participants lived within major cities. While platforms like Xiaohongshu and WeChat may be popular in both urban and rural areas, the distinct challenges of rural populations in acquiring Paxlovid may not be fully accounted for in this work. Future research may focus on Chinese rural populations' acquisition of healthcare and its attendant emotional labor (for guiding research in the U.S. context, see: [39].)

## 8 CONCLUSION

In this paper, we have shown the precarity people have experienced in search of safety in China post-zero-COVID policies. Through tracing the changes in China's public health policies and official discourses during COVID-19, we have uncovered how an imaginary—the country as self-sustaining and effective in keeping the pandemic at bay—was presented in state narratives that then ceased, replaced by de-regulation, the removal of state care, and a greater emphasis on individualized

practices that then became critical to guarantee personal safety. We have attended to individual precarity—anxiety, confusion, loss, pain—that was experienced as individuals searched for the antiviral medication. We argued that these affective states are part of the unfolding crisis and constitute a part of individual anticipation work, motivating individuals to work for a future of hope through the turmoil of the present.

Through the analytical lens of anticipation work, we have shown that Paxlovid has been an object of anticipation, sought after at present in anticipation of future illness. We highlight how social media platforms played a role in the process, both facilitating acquisition and scams. We complicate anticipation work by focusing on conflict between individuals, highlighting the difficulty of collaborative work alongside precarity, affect, and material scarcity. This individualized anticipation work, predicated on information gathering and spreading on social media platforms, as well as daily practices from online to offline sites, asks us to attend to the localized, and unscalable feelings and experiences of individuals. Such work calls on us to notice individualized precarity within a collaborative system and reminds us that all collaboration requires personal efforts and work that can sometimes conflict within a larger collaborative project.

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## REFERENCES


[1] Lila Abu-Lughod. 1990. Can there be a feminist ethnography? *Women & Performance: a journal of feminist theory* 5, 1 (1990), 7–27.

[2] Vincanne Adams, Michelle Murphy, and Adele E Clarke. 2009. Anticipation: Technoscience, life, affect, temporality. *Subjectivity* 28 (2009), 246–265.

[3] AFP. 2023. "Every second counts": Chinese resort to black market for COVID-19 treatments. (2023). https://www.abc.net.au/news/2023-01-05/chinese-wanting-covid-19-drugs-head-to-black-market/101830858

[4] Azadeh Akbari and Rashid Gabdulhakov. 2019. Platform surveillance and resistance in Iran and Russia: The case of Telegram. *Surveillance & Society* 17, 1/2 (2019), 223–231.

[5] Roland Barthes. 2013. Mythologies: The complete edition. *NY: Hill and Wang* (2013).

[6] David Beer. 2017. The social power of algorithms. , 13 pages.

[7] Shao Bingyan and Yang Yang. 2023. The supply of Pfizer's oral COVID-19 medication has eased. Some community hospitals have stocked up with a hundred boxes, making it less challenging to purchase the medicine on e-commerce platforms. (2023). https://m.thepaper.cn/newsDetail_forward_21420989

[8] Louis P Bucklin. 1993. Modeling the international gray market for public policy decisions. *International Journal of Research in Marketing* 10, 4 (1993), 387–405.

[9] Christine Chen, Nicola Dell, and Franziska Roesner. 2019. Computer security and privacy in the interactions between victim service providers and human trafficking survivors. In *28th USENIX Security Symposium (USENIX Security 19)*. 89–104.

[10] Yuchen Chen, Alex Jiahong Lu, and Angela Xiao Wu. 2023. 'China' as a 'Black Box?' Rethinking methods through a sociotechnical perspective. *Information, Communication & Society* (2023), 1–17.

[11] Yujie Chen, Zhifei Mao, and Jack Linchuan Qiu. 2018. *Super-sticky WeChat and Chinese society*. Emerald Publishing Limited.

[12] Yuchen Chen, Yuling Sun, and Silvia Lindtner. 2023. Maintainers of Stability: The Labor of China's Data-Driven Governance and Dynamic Zero-COVID. In *Proceedings of the 2023 CHI Conference on Human Factors in Computing Systems*. 1–16.

[13] Luigina Ciolfi. 2013. The collaborative work of heritage: open challenges for CSCW. In *ECSCW 2013: Proceedings of the 13th European Conference on Computer Supported Cooperative Work, 21-25 September 2013, Paphos, Cyprus*. Springer, 83–101.

[14] Luigina Ciolfi, Myriam Lewkowicz, and Kjeld Schmidt. [n. d.]. CSCW: History, Core Issues, and Approaches in Computer-Supported Cooperative Work. ([n. d.]).

[15] Adele E. Clarke. 2016. Anticipation work: Abduction, simplification, hope. *Boundary objects and beyond: Working with Leigh Star* 85 (2016).

[16] Adele E Clarke, Carrie Friese, and Rachel Washburn. 2015. *Situational analysis in practice: Mapping research with grounded theory*. Vol. 1. Left Coast Press.

[17] Chinese National Health Commission. 2023. Notice on Issuing the Diagnosis and Treatment Plan for Severe Cases of Novel Coronavirus Infection (Trial Version 4). (2023). http://www.gov.cn/zhengce/zhengceku/2023-01/14/content-5736879.html

[18] State Council. 2022. Commentary: Fighting COVID, everyone is responsible for their own health. (2022). http://www.news.cn/politics/2022-11/26/c_1129163002.htm

[19] J Ignacio Criado, Ariana Guevara-Gómez, and Julián Villodre. 2020. Using collaborative technologies and social media to engage citizens and governments during the COVID-19 Crisis. The case of Spain. *Digital Government: Research and Practice* 1, 4 (2020), 1–7.

[20] Alain Darbel and Pierre Bourdieu. 1963. *Travail et travailleurs en Algérie*. Vol. 2. Mouton.

[21] China Business News Data. 2022. 2022 Active User Portrait Trend Report (Xiaohongshu Platform). (2022). https://www.cbndata.com/report/2891/detail?isReading=report&page=1

[22] David. 2023. Top Chinese social media platforms in 2023. (2023). https://sekkeidigitalgroup.com/top-chinese-social-media-platforms-2023/

[23] Shengli Deng, Yuting Jiang, Hongxiu Li, and Yong Liu. 2020. Who contributes what? Scrutinizing the activity data of 4.2 million Zhihu users via immersion scores. *Information Processing & Management* 57, 5 (2020), 102274.

[24] Owen Dyer. 2022. Covid-19: Protests against lockdowns in China reignite amid crackdown.

[25] Dale F Eickelman. 1979. The political economy of meaning.

[26] Cansu Ekmekcioglu, Priyank Chandra, and Syed Ishtiaque Ahmed. 2023. A Matter of Time: Anticipation Work and Digital Temporalities in Refugee Humanitarian Assistance in Turkey. *Proceedings of the ACM on Human-Computer Interaction* 7, CSCW1 (2023), 1–36.

[27] Robert M Emerson, Rl Fretz, and L Linda. 2009. Writing Ethnographic Fieldnotes.

[28] Claudia Flores-Saviaga and Saiph Savage. 2021. Fighting disaster misinformation in Latin America: the# 19S Mexican earthquake case study. *Personal and Ubiquitous Computing* 25 (2021), 353–373.

[29] Nectar Gan, Eric Cheung, and Selina Wang. 2023. Beijing to distribute Pfizer antiviral drug as Covid wave strains health system. (2023). https://www.cnn.com/2022/12/26/china/china-covid-beijing-paxlovid-distribution-intl-hnk/index.html

[30] Steffen Haesler, Stefka Schmid, Annemike Sophia Vierneisel, and Christian Reuter. 2021. Stronger together: how neighborhood groups build up a virtual network during the COVID-19 pandemic. *Proceedings of the ACM on Human-Computer Interaction* 5, CSCW2 (2021), 1–31.

[31] Vaughn Hamilton, Hanna Barakat, and Elissa M Redmiles. 2022. Risk, resilience and reward: Impacts of shifting to digital sex work. *Proceedings of the ACM on Human-Computer Interaction* 6, CSCW2 (2022), 1–37.

[32] Yangyang Han, Reidar K Lie, and Rui Guo. 2020. The internet hospital as a telehealth model in China: systematic search and content analysis. *Journal of Medical Internet Research* 22, 7 (2020), e17995.

[33] Donna Haraway. 2013. A cyborg manifesto: Science, technology, and socialist-feminism in the late twentieth century. In *The transgender studies reader*. Routledge, 103–118.

[34] Daniel Hellmann, Carleen Maitland, and Andrea Tapia. 2016. Collaborative analytics and brokering in digital humanitarian response. In *Proceedings of the 19th ACM Conference on Computer-Supported Cooperative Work & Social Computing*. 1284–1294.

[35] Jen-Hung Huang, Bruce CY Lee, and Shu Hsun Ho. 2004. Consumer attitude toward gray market goods. *International marketing review* 21, 6 (2004), 598–614.

[36] Y Linlin Huang, Kate Starbird, Mania Orand, Stephanie A Stanek, and Heather T Pedersen. 2015. Connected through crisis: Emotional proximity and the spread of misinformation online. In *Proceedings of the 18th ACM conference on computer supported cooperative work & social computing*. 969–980.

[37] Sheila Jasanoff and Sang-Hyun Kim. 2009. Containing the atom: Sociotechnical imaginaries and nuclear power in the United States and South Korea. *Minerva* 47 (2009), 119–146.

[38] Michael Kackman and Mary Celeste Kearney. 2018. *The craft of criticism: Critical media studies in practice*. Routledge.

[39] Elizabeth Kaziunas, Michael S Klinkman, and Mark S Ackerman. 2019. Precarious interventions: Designing for ecologies of care. *Proceedings of the ACM on Human-Computer Interaction* 3, CSCW (2019), 1–27.

[40] Youngrim Kim, Yuchen Chen, and Fan Liang. 2023. Engineering care in pandemic technogovernance: The politics of care in China and South Korea's COVID-19 tracking apps. *New media & society* 25, 6 (2023), 1432–1450.

[41] Neha Kumar, Azra Ismail, Samyukta Sherugar, and Rajesh Chandwani. 2019. Restoration work: Responding to everyday challenges of HIV outreach. *Proceedings of the ACM on Human-Computer Interaction* 3, CSCW (2019), 1–26.

[42] Massimo La Morgia, Alessandro Mei, Alberto Maria Mongardini, and Jie Wu. 2021. Uncovering the dark side of Telegram: Fakes, clones, scams, and conspiracy movements. *arXiv preprint arXiv:2111.13530* (2021).

[43] Patricia Leavy and Anne Harris. 2018. *Contemporary feminist research from theory to practice*. Guilford Publications.

[44] Emma Lee. 2023. Is Paxlovid too expensive for China to purchase? Radio Free Asia. (2023). https://www.rfa.org/english/news/china/fact-check-01142023104123.html

[45] Huaigu Li and Michael L Best. 2022. Understanding Accessibility Issues in China's Contact Tracing Systems During the COVID-19 Pandemic for Visually Impaired People. In *Proceedings of the 4th International Conference on Big Data Engineering*. 127–133.

[46] Che-Hui Lien, Yang Cao, and Xing Zhou. 2017. Service quality, satisfaction, stickiness, and usage intentions: An exploratory evaluation in the context of WeChat services. *Computers in human behavior* 68 (2017), 403–410.

[47] T.W. Liu. 2023. COVID-Ravaged Chinese Public Is Desperate for Paxlovid. (2023). https://foreignpolicy.com/2023/01/12/covid-19-china-paxlovid-outbreak-black-market/

[48] George E Marcus. 1995. Ethnography in/of the world system: The emergence of multi-sited ethnography. *Annual review of anthropology* 24, 1 (1995), 95–117.

[49] Nathalie Marechal. 2018. From Russia with crypto: A political history of Telegram. In *8th USENIX Workshop on Free and Open Communications on the Internet (FOCI 18)*.

[50] & Leonard Jenny Martin, Peter. 2023. The U.S. Keeps Offering China Its COVID Vaccines. China Keeps Saying No. (2023). https://time.com/6245054/us-china-covid-vaccines/

[51] Genetec Meheco. 2022. *Announcement of China Medical System Holdings Limited on Signing Agreement with Pfizer Inc.* Genetec Meheco.

[52] Ingrid Melander and Guy Faulconbridge. 2024. Telegram messaging app CEO Durov arrested in France. (2024). https://www.reuters.com/world/europe/telegram-messaging-app-ceo-pavel-durov-arrested-france-tf1-tv-says-2024-08-24

[53] Meta. 2023. Meta Reports Third Quarter 2023 Results. (2023). https://investor.fb.com/investor-news/press-release-details/2023/Meta-Reports-Third-Quarter-2023-Results/default.aspx

[54] Nicholas Micallef, Vivienne Armacost, Nasir Memon, and Sameer Patil. 2022. True or false: Studying the work practices of professional fact-checkers. *Proceedings of the ACM on Human-Computer Interaction* 6, CSCW1 (2022), 1–44.
[55] Devajit Mohajan and Haradhan Mohajan. 2022. Memo Writing Procedures in Grounded Theory Research Methodology. (2022).
[56] Bloomberg News. 2021. Billionaire's Bet on Pfizer Vaccine for China Fails to Pay Off. (2021). https://www.bloomberg.com/news/articles/2021-12-12/billionaire-s-bet-on-pfizer-vaccine-for-china-fails-to-pay-off#xj4y7vzkg
[57] China Business News. 2022. Antiviral oral medicine for COVID entered at least 8 provinces. (2022). https://m.yicai.com/news/101362293.html
[58] Newsgram. 2023. Pfizer cut the price of Paxlovid, but China wouldn't accept it, says industry insider. (2023). https://www.newsgram.com/china-update/2023/01/14/pfizer-cut-the-price-of-paxlovid-but-china-wouldnt-accept-it-says-industry-insider
[59] Lam Oiwan. 2023. Why was the major COVID-19 drug Paxlovid delisted from China's medical insurance scheme? Global Voices. (2023). https://globalvoices.org/2023/01/17/why-was-the-major-covid-19-drug-paxlovid-delisted-from-chinas-medical-insurance-scheme/
[60] World Health Organization et al. 2022. WHO Recommends Highly Successful COVID-19 Therapy and Calls for Wide Geographical Distribution and Transparency from Originator. *news release, April* 22 (2022).
[61] Dimitris Papadopoulos, Niamh Stephenson, and Vassilis Tsianos. 2008. *Escape routes: Control and subversion in the twenty-first century*. Pluto Press.
[62] The Paper. 2020. Close-up | "All front-line positions have been replaced by party members, no bargaining!". (2020). https://www.thepaper.cn/newsDetail\T1\textemdashforward\T1\textemdash5676064
[63] Altman Yuzhu Peng, Jenny Zhengye Hou, Majid KhosraviNik, and Xiaoxiao Zhang. 2023. "She uses men to boost her career": Chinese digital cultures and gender stereotypes of female academics in Zhihu discourses. *Social Semiotics* 33, 4 (2023), 750–768.
[64] Toby Pepperrell, Leah Ellis, Junzheng Wang, and Andrew Hill. 2022. Barriers to worldwide access for Paxlovid, a new treatment for COVID-19. In *Open forum infectious diseases*, Vol. 9. Oxford University Press US, ofac174.
[65] N. Perik. 2023. Little Red Book Marketing, how to advertise on the "Chinese Instagram"? (2023). https://maf.ad/en/blog/little-red-book-marketing-chinese-instagram/
[66] Pfizer. 2021. Pfizer's novel COVID-19 oral antiviral treatment candidate reduced risk of hospitalization or death by 89% in interim analysis of phase 2/3 EPIC-HR study. *Nota de prensa* (2021).
[67] Pfizer. 2022. Pfizer signs supply agreement with Genertec Meheco for its COVID-19 treatment drug PAXLOVID. *Pfizer China* (2022).
[68] Gabriel G Plata. 2022. The black market for covid-19 antiviral drugs. *bmj* 377 (2022).
[69] James Pollard. 2023. Pfizer CEO Clarifies Details of Talks With China on Covid Drug. (2023). https://www.asiafinancial.com/pfizer-clarifies-details-of-talks-with-china-on-covid-drug
[70] State Council's Joint Prevention and Control Mechanism Working Group. 2022. Notice on further optimizing and implementing measures for the prevention and control of COVID-19. (2022). http://www.nhc.gov.cn/xcs/gzzcwj/202212/8278e7a7aee34e5bb378f0e0fc94e0f0.shtml
[71] Cao Qingwing. 2023. Pfizer expects to start making COVID drug Paxlovid in China in 3 to 4 months. (2023). https://news.cgtn.com/news/2023-01-10/Pfizer-expects-to-start-making-Paxlovid-in-China-in-3-to-4-months--1gu4gQTGbpC/index.html
[72] Reuters. 2022. China Meheco Group shares jump after agreement to import Pfizer's COVID treatment paxlovid. (2022). https://www.reuters.com/business/healthcare-pharmaceuticals/china-meheco-group-shares-jump-after-agreement-import-pfizers-covid-treatment-2022-12-15/
[73] Reuters. 2023. China says COVID outbreak has infected 80% of population. (2023). https://www.reuters.com/world/china/china-says-covid-outbreak-has-infected-80-population-2023-01-21/
[74] Reuters. 2023. Pfizer CEO says there will be no generic Paxlovid for China. (2023). https://www.cnbc.com/2023/01/10/pfizer-ceo-says-there-will-be-no-generic-paxlovid-for-china.html
[75] Michael Patrick Ryan. 1998. *Knowledge diplomacy: Global competition and the politics of intellectual property*. Brookings Institution Press.
[76] J Salmons. 2016. Collecting extant data online. *Doing Qualitative Research Online; Sage Publications: London, UK* (2016), 115–125.
[77] Janet Salmons. 2021. Doing qualitative research online. *Doing Qualitative Research Online* (2021), 1–100.
[78] Catherine Shu. 2013. Meet Telegram, A Secure Messaging App From the Founders of VK, Russia's Largest Social Network. *Tech Crunch* (2013).
[79] Robert Soden and Leysia Palen. 2018. Informating crisis: Expanding critical perspectives in crisis informatics. *Proceedings of the ACM on human-computer interaction* 2, CSCW (2018), 1–22.

[80] Weilen Soon. 2022. Chinese tech giant Tencent jumps onto the list of the world's 10 most valuable companies as meta slides on Stock rout. (2022). https://www.businessinsider.com/tencent-top-10-most-valuable-firms-after-meta-stock-rout-2022-2
[81] Ewan Soubutts, Amid Ayobi, Rachel Eardley, Kirsten Cater, and Aisling Ann O'Kane. 2021. Aging in place together: the journey towards adoption and acceptance of stairlifts in multi-resident homes. *Proceedings of the ACM on Human-Computer Interaction* 5, CSCW2 (2021), 1–26.
[82] James P Spradley. 2016. *Participant observation.* Waveland Press.
[83] Stephanie B Steinhardt and Steven J Jackson. 2015. Anticipation work: Cultivating vision in collective practice. In *Proceedings of the 18th ACM conference on computer supported cooperative work & social computing*. 443–453.
[84] TL Taylor, Tom Boellstorff, Bonnie Nardi, and Celia Pearce. 2013. *Ethnography and virtual worlds: A handbook of method.* Princeton university press.
[85] Telegram. 2023. Telegram Press Info. (2023). https://telegram.org/press
[86] L. Thomala. 2022. WeChat: User age distribution 2022. (2022). https://www.statista.com/statistics/387658/wechat-china-user-age/
[87] L. Thomala. 2023. Zhihu: Monthly active users 2023. (2023). https://www.statista.com/statistics/1298392/zhihu-monthly-active-users/
[88] John Thornhill. 2015. Lunch with the FT: Pavel Durov. *Financial Times* 3 (2015).
[89] Cathy Tie. 2023. Generics: A missing piece in China's covid-19 crisis response. (2023). https://www.statnews.com/2023/02/02/generics-missing-piece-china-covid-19-response/
[90] Anna Lowenhaupt Tsing. 2015. The Mushroom at the End of the World. In *The Mushroom at the End of the World.* Princeton University Press.
[91] Shaun Walker. 2020. Nobody can block it": how the Telegram app fuels global protest. *The Guardian* (2020).
[92] Cara Wallis. forthcoming. *Social Media and Ordinary Life: Affect, Ethics, and Aspiration in Contemporary China.* New York University Press.
[93] Noel Warford, Tara Matthews, Kaitlyn Yang, Omer Akgul, Sunny Consolvo, Patrick Gage Kelley, Nathan Malkin, Michelle L Mazurek, Manya Sleeper, and Kurt Thomas. 2022. SoK: A framework for unifying at-risk user research. In *2022 IEEE Symposium on Security and Privacy (SP)*. IEEE, 2344–2360.
[94] Raymond Williams. 1977. *Marxism and literature.* Vol. 392. Oxford Paperbacks.
[95] Xiaohongshu. 2023. About Xiaohongshu. (2023). https://www.xiaohongshu.com/protocols/about
[96] Jie Yang. 2015. *Unknotting the heart: Unemployment and therapeutic governance in China.* Cornell University Press.
[97] Kai-Cheng Yang, Francesco Pierri, Pik-Mai Hui, David Axelrod, Christopher Torres-Lugo, John Bryden, and Filippo Menczer. 2021. The COVID-19 infodemic: twitter versus facebook. *Big Data & Society* 8, 1 (2021), 20539517211013861.
[98] Zeyi Yang. 2023. China's Paxlovid cyber scams are everywhere. (2023). https://www.technologyreview.com/2023/01/11/1066605/chinas-paxlovid-cyber-scams/
[99] Hang Yin, Ning Jiang, Wenhao Shi, Xiaojuan Chi, Sairu Liu, Ji-Long Chen, and Song Wang. 2021. Development and effects of influenza antiviral drugs. *Molecules* 26, 4 (2021), 810.
[100] Zhong Yin. 2023. Being active provides solide support to prevent and control the pandemic. (2023). http://paper.people.com.cn/rmrb/html/2023-01/02/nw.D110000renmrb_20230102_5-04.htm
[101] Chenchen Zhang. 2022. Contested disaster nationalism in the digital age: Emotional registers and geopolitical imaginaries in COVID-19 narratives on Chinese social media. *Review of International Studies* 48, 2 (2022), 219–242.
[102] Longxuan Zhao, Jiacheng Liu, and Zhanghao Li. 2022. Online dating beyond dating apps: An exploration of self-presentation of Chinese gay men dating on Zhihu. *International Journal of Communication* 16 (2022), 19.
[103] Hu Yuanqiong & Xue Guangjian Zhu, Zhenyan. 2023. Amid Scarcity And Soaring Prices, China Could Issues Compulsory License For Paxlovid. (2023). https://healthpolicy-watch.news/overcoming-intellectual-property-barriers-covid-china

## A SUMMARY OF PLATFORMS




**Xiaohongshu** 小红书 was developed and founded in Shanghai, China, in 2013, and is a social e-commerce platform. By the end of 2022 [21], the monthly active users (MAU) on Xiaohongshu is about 200 million, with approximately 72% being "post-90s"—90后, or people born after 1990. The user base is split evenly between urban areas and less developed rural areas [21, p.7]. Among its users, around 70% of its users identify as female [21, p.7]. Taking these statistics together, Xiaohongshu is a platform predominately peopled by women born after 1990 while the platform enjoys both rural and urban popularity.

Xiaohongshu combines elements of social media and online shopping, utilizing a combination of influencer marketing, user-generated content, and e-commerce functionality to present itself as comparable to Instagram [65]. In this way, Xiaohongshu is a platform dedicated to "lifestyle". The mission of the platform is to "inspire living," and to encourage users to "share and find the wonders of the world" [95]. The platform encourages users to share their daily experiences, information, and knowledge with others to create communities. As such, Xiaohongshu was used during the post-zero COVID moment as a digital hub for discussions concerning increasing illness, safety, and navigation in uncertain times. During COVID-19, Xiaohongshu became a hub of (mis)information with users sharing their symptoms (if they were infected), tragic stories of friends and family members' illnesses, and where to buy test kits, medicine, or medical resources. In response to the negative impacts caused by the platform's misinformation, Xiaohongshu cautioned users by showing professional medical care options on its interface if users search for information related to COVID-19 or Paxlovid, much like YouTube's interface including CDC recommendations.



**WeChat** 微信 was developed in Shenzhen, China, in 2010 and is predominantly a social and communication platform. WeChat's parent company is Tencent, the world's tenth most valuable company by market value [80]. By the end of 2022, WeChat has 1.3 billion monthly active users. Approximately 34% of the users are in the 25-35 age group; about 43% of users identify as female while 57% identify as male [86].

While WeChat is utilized worldwide by an international audience, in mainland China the platform is seen as a "super-sticky" multi-modal platform as it provides multiple public services that cover various aspects of contemporary life [11]. WeChat is mostly used for private groups and communication, similar to WhatsApp and iMessage. Within WeChat, users can form chat groups (not allowed with total strangers), share personal life moments (only visible to contacts or set certain postings visible to total strangers), subscribe to official WeChat accounts and read their articles, etc. In addition to these text messaging, posting, videotelephony, and conferencing functionalities, WeChat is embedded in other aspects of everyday life [46]. WeChat , through API "mini-programs" connects to health and wellness apps, such as Meituan, as a space to communicate with and book doctor's appointments or buy medicine. Such functions are critical and helpful for the public to seek healthcare during COVID-19. In our research project, both the Meituan mini-program in WeChat and app were utilized interchangeably by informants to seek doctor's appointments and medical resources. Beyond health and wellness, WeChat is a municipal space to register for a marriage application, contact the post office, and verify traffic records, etc. and the platform is an essential part of China's mobile payment ecosystem. WeChat, then, is present in many cultural, social, and political contexts, a ubiquitous part of daily life for mainland Chinese individuals.



**Zhihu** 知乎 is a social question-and-answer platform—essentially, the Chinese equivalent to Quora. "Zhihu" means "Do you know" in English. Launched in 2011, Zhihu operates mostly in mainland China and, by the end of 2022, has 103 million monthly active users [87]. The platform is designed to connect individuals with "experts"—other users who have a noted expertise in a given field, fostering knowledge-sharing. Zhihu has expanded this idea of knowledge-sharing beyond the social Q&A format, providing online classes, live-streamed lectures, and blog posts by experts. The platform bills itself as a provider of knowledge and information for those who are well-educated—about 80% of the registered Zhihu users have a Bachelor's degree or above [22]. The platform has been noted as a significant resource for online knowledge sharing in the Chinese context [23, 63, 102]. Zhihu was vocally dedicated to providing a scientific perspective during COVID-19, demystifying COVID-19, and taking on COVID-19 misinformation, with authoritative public scholars and figures interfacing on Zhihu to educate the public.



**Facebook** was founded in 2004 at Harvard University in Massachusetts, U.S. Facebook constitutes one of the most popular social media platforms worldwide—its parent company Meta additionally owns instant messaging conglomerate WhatsApp and social networking platform Instagram, a portfolio of platforms that averages 3.14 billion daily active users with Facebook itself having over 3.049 billion monthly active users [53].

As a platform, Facebook features a timeline for each individual user, including all comments, posts, and other interactions a user has; a news feed; a marketplace; Memories, where users see posts they were tagged in and their Facebook anniversaries; Groups, where individual users can come together as members of user-generated groups to share in collaboration or discussion; Messenger, Facebook's proprietary messaging app and more—an ecosystem of features that each allow for distinct information, interactions, and transactions. Different systems on Facebook were utilized during the Paxlovid crisis discussed above: for instance, Groups were formed around acquiring Paxlovid, some public while others private and private Messenger messages were sent, requesting doses. All in all, Facebook constituted a significant platform during COVID-19 for the dissemination of information and misinformation (see: [97] for more information).



**Telegram** is an encrypted messaging platform founded by Pavel Durov, a Russian citizen who runs Telegram out of Dubai, United Arab Emirates. Telegram is run with the intent to "shelter the team from unnecessary influence" after Durov's previous venture succumbed to state influence [88, 91]. On August 24, 2024, Pavel was arrested in France on criminal charges stemming from Telegram's use in illicit criminal activity [52]. In their own words, Telegram is dedicated to "protecting user privacy and human rights such as freedom of speech and assembly" [85]. The platform has 800 million monthly active users [85].

Unlike other and more public platforms, Telegram's features include client-to-client encrypted "secret chats", account self-destruction, and an elevated interest in privacy [78]. As such, Telegram has been the focus of research on privacy, security, and clandestine activities [4, 42, 49]. In our research, Telegram was often advertised on Facebook as a more secure way of acquiring Paxlovid via gray markets. Paxlovid was often "bought" and "sold" via Telegram, with users leaning on the platform's interest in security as a way to claim legitimacy.

## B DIAGRAMS OF INDIRECT PLATFORM ROUTES

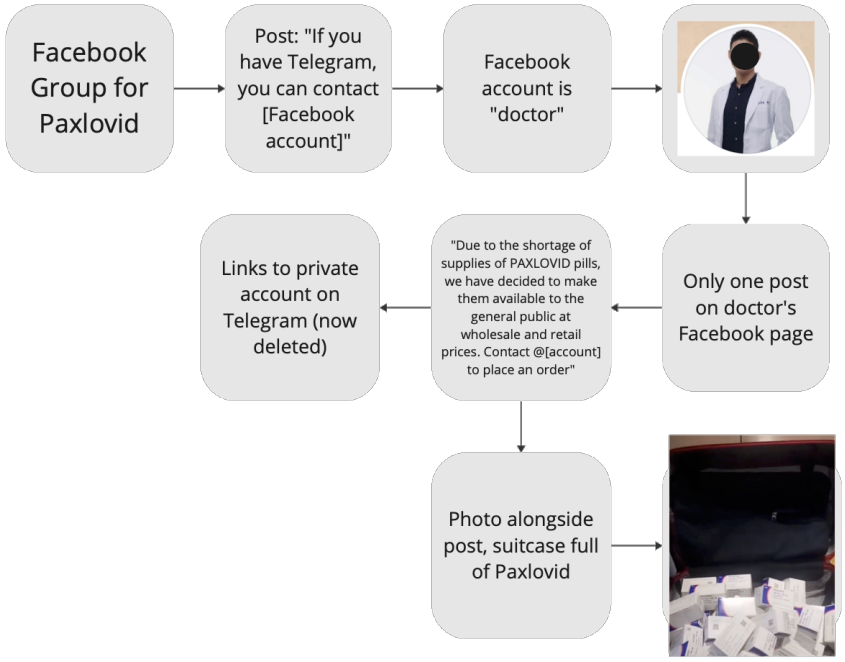



Fig. 1. Flowchart of Facebook post that takes the reader to Telegram

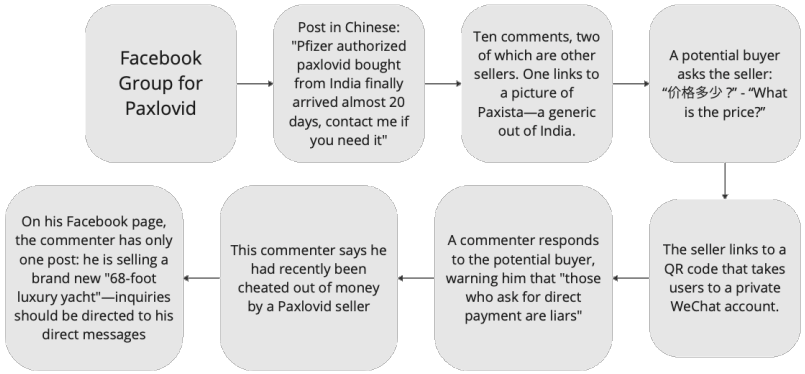



Fig. 2. Flowchart of Facebook post that takes the reader to WeChat, with derisive comments

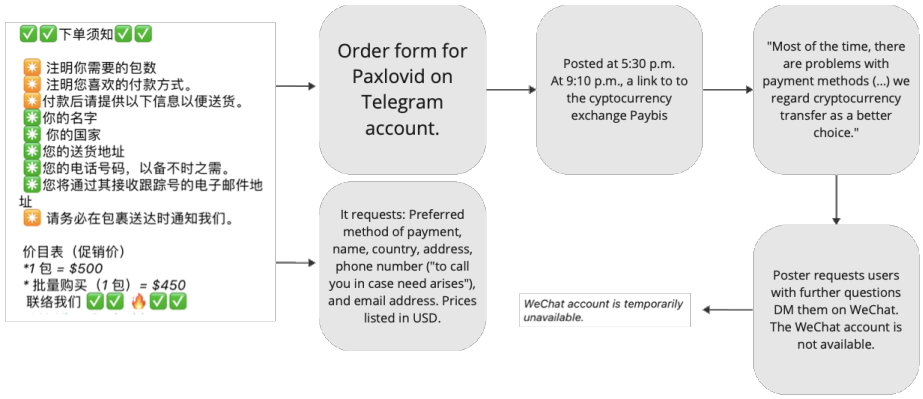



Fig. 3. Flowchart of Telegram post that requests sensitive information and cryptocurrency use

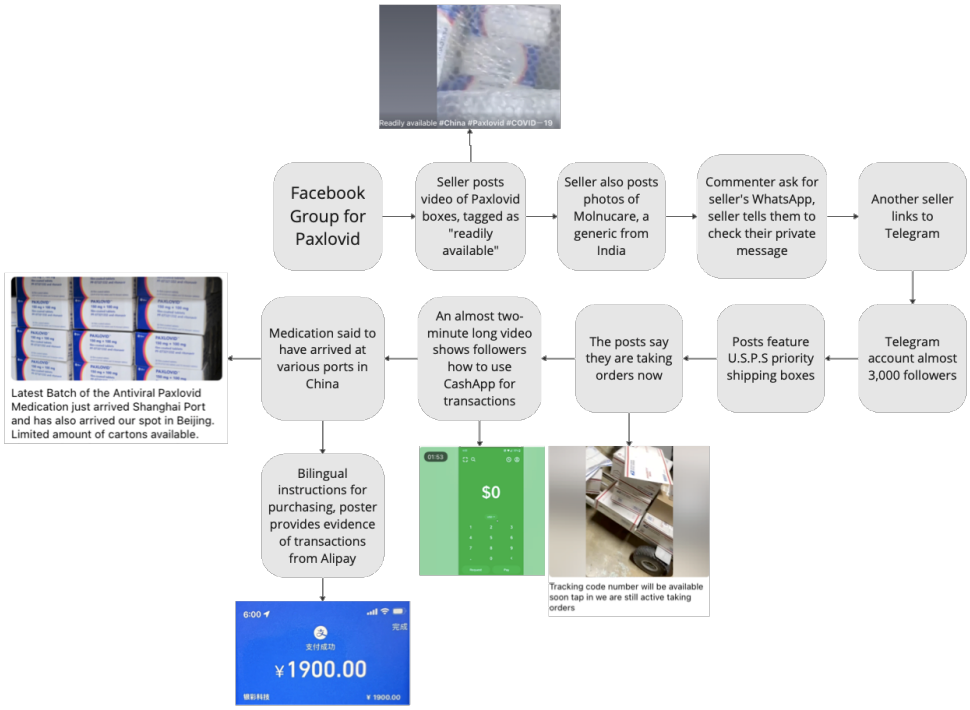



Fig. 4. Flowchart of Facebook post that takes the reader to Telegram, with posts that blur U.S./China boundary

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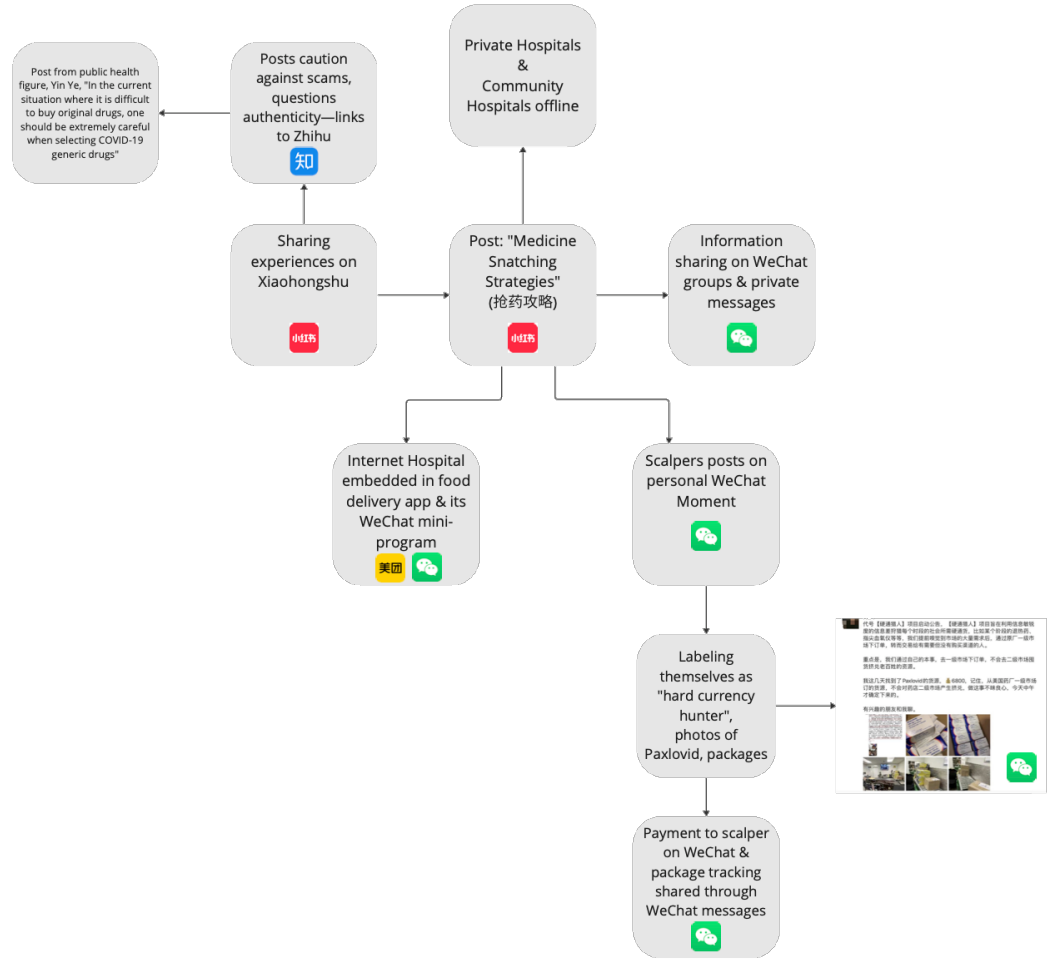



Fig. 5. Flowchart of user experiences shared on Xiaohongshu that lead to WeChat, Zhihu, and Meituan