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Red, Yellow, Green: Test, Test, Test

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When the Health Code was in use in China, the local governments of Shenzhen and Changsha, like many others, required individuals to present a 'green code' to move within and between locations. In this essay, we focus on moments when green codes unexpectedly turned yellow. By studying these changes, we gain insight into how the infrastructure of automated control was challenged when people affected by the system and those administering it had to find ways of working around, altering, or re-enforcing the code.

Shenzhen, the home city of Tencent and a global technology hub, has long been one step ahead of the rest of China in digital governance and control. In October 2022, the city's Bao'an District—where one of the authors of this paper, Hailing, was living—witnessed a small-scale outbreak of Covid-19. In response, the district government announced a '24-hour PCR test order', meaning people could only enter public places, including restaurants, bars, and shops, by providing a negative PCR test result obtained within the previous 24 hours and displayed on the Health Code app. Free PCR testing stations were set up in almost every gated community in Shenzhen, operating from 6pm to 10pm, when most people were returning home from work. People who failed to register a valid negative test result would find their codes automatically turning from 'green' to 'yellow' a few days later. It did not matter whether the code was green: if the test result was too old, their mobility would still be severely restricted.

One evening, when Hailing and her mother were queuing at the testing station for their daily PCR test, her mother looked at her phone and, to her surprise,

found that she had a yellow code. As they realised that her code had changed, people in the queue immediately began to move away from them. This was not an isolated incident. As many people in Shenzhen were given yellow codes by the automated systems, seemingly without reason, the city government set up numerous testing centres specially designated to deal with these cases. These centres were also supposed to handle cases considered to be 'risky', especially those involving people working in occupations categorised as more dangerous than others by the municipal government, such as taxi drivers, delivery workers, bus drivers, community healthcare workers, etcetera. These individuals had to visit the special centres along with those who received a yellow code. Over the months of testing at her local community testing centre, Hailing had repeatedly witnessed delivery people being turned away even if they held a green code.

Test centres for yellow-code holders were much bigger than those in local neighbourhoods and people had to travel some distance by foot, bike, or car to reach them. When Hailing's mother's code turned yellow that evening, they turned to the WeChat account of the Shenzhen Health Commission and found that the nearest yellow-code centre was about a 10-minute walk away, in a public park. The hygiene procedures there were the same as in their community. About two hours after being tested in the yellow-code test centre, Hailing's mother's health code turned green again, even though the latest test result was not yet ready. When it came, the test result did not arrive any faster than it would have from the community testing facility.

Integrating with Shenzhen's Existing Smart City

Before Covid-19, Shenzhen's advanced digital control mechanisms resulted in a huge amount of labour recruitment to facilitate the high-tech governance of several million migrant workers—the highest concentration in China. This recruitment campaign was part of the 'Weaving the Net Project' (织网工程), an initiative to govern the migrant population through 'internet plus social construction' (互联网+社会建设) (Zhao and Douglas-Jones 2022). In 2020, this project recruited more than 16,000 'community data workers' (网格员) to sift through and produce data on the citizenry—a number that increased tremendously during the pandemic. In fact, given the endless Covid-19 outbreaks in Shenzhen between 2020 and 2023, the data workers came to play an increasingly important role in helping local governments better understand and control the various communities in the city. Before Hailing's arrival in Shenzhen from overseas in October 2021, for example, the community data workers were the ones who came to visit her parents' home, checking whether it was isolated enough for Hailing's home quarantine and setting up cameras in front of the main door because Hailing had been given a red code during her hotel quarantine. Hailing's personal information—including her phone number, name, travel history, and ID number—was also collected by the community data workers.

In October 2022, when a resident in Hailing's gated community tested positive, all the neighbours in the building were automatically given a red code, as were the classmates of the infected resident's two children. All community residents were asked to stay at home and the street-level government (街道办) sent a work team to test every household. During this 'community-scale special test' (社区核酸检测), Hailing found that the work team members were in possession of a booklet with the names and phone numbers of each registered household. Hailing saw her and her mother's names and phone numbers in it. This made it easy for the workers to know who was at home and who was not and who needed to be traced later. In fact, one of Hailing's neighbours happened to be travelling to another city at that time, so the data workers called all their family members to make sure they got tested as soon as possible.

Dealing with Difficult Individuals

Those who sought to evade testing—for instance, by staying home—would be called by the community data workers, who would warn them that they might receive a 'red code' later. The general assumption in Hailing's community was that the strict approach to these untested people was due to the worry that they might find ways to go out even with a yellow code.

A 'red code' meant that the local government could forcibly quarantine the person in question. Hailing's aunt, who was also living in Shenzhen, had lung surgery in August 2022. She was unable to go outside to be tested in the first few weeks after the surgery. Unsurprisingly, her health code turned to yellow. A week later, she received a call from the street-level government, saying they had discovered her health code had been yellow for some time and she should do a test as soon as possible to avoid being given a red code and having the government workers come to her home. After negotiating with this caller, Hailing's aunt accepted the fact that she would be given a red code, but the government workers agreed not to visit her as she reassured them she would stay home. The government worker trusted that she would not try to leave.

As more and more nearby areas came under quarantine, Hailing and her family had no choice but to keep doing PCR tests every day to enable them to go out. On waking one morning, Hailing found her code had turned yellow. She had been tested the previous night about 8pm, the negative result had arrived about 2am, yet she received a yellow code about 4am. She then found a new notice on her building's WeChat group: from 9am to 11am, health workers would be coming to test those in the community who had yellow codes. When she went for testing again (only 10 hours after the previous test), she found a very long queue: almost every household had someone who was yellow in the queue. When scanning her personal PCR code, she asked the testing worker why so many residents had suddenly received a yellow code. The worker smiled bitterly, saying: 'Probably the district government does not want us to go outside at all, there are so many high-risk areas.'

Shenzhen is an example of how the local governance structure, including its digital infrastructure and associated labour, worked together during this unprecedented period. These structures had been designed largely for governance of migrant populations, but Covid-19 control and prevention work offered a better opportunity to more comprehensively categorise, discipline, and monitor population mobility on a broader scale. This gave the city a distinct advantage in preventing large-scale outbreaks over longer periods, to the point that some government reports on the pandemic highlighted Shenzhen as a 'role model' city. Shenzhen was one of the cities with the most PCR testing centres in China. At the same time, Shenzhen was also home to many of China's fastest-developing PCR testing companies, which expanded across the country as the industry became highly profitable.

In this sense, Shenzhen can be seen as both an exception to pandemic governance and a vanguard in terms of the application of high-tech surveillance and governance. As such, it is worth examining Shenzhen's experience of the pandemic through comparison with other places that had a smaller mobile population and less prepared infrastructure—for example, Changsha, the capital of Hunan Province in central China, which is where one of the authors, Han, experienced the pandemic.

Handling Yellow Code Complaints in Changsha

Between July and October 2022, Han returned to her hometown, Changsha, three times. Entering a new city always increased the risk of a changed heath code. The first time Han's health code turned from green to yellow in Changsha was on 13 July 2022, the fifth day after her arrival. She had followed the instructions for incoming domestic travellers: two PCR tests within three days of arrival, one on the first day and one on the third day. She had also filled out the 'arrival report form' on Changsha's official WeChat mini program.

She discovered her yellow code when she was entering a mall on day five and the security guard asked everyone to scan the venue's QR code (场所码). This scanning wass done to record and track which places individuals visited. When scanned, the name of the venue shows up at the top of one's health code. After Han's scan, the security guard saw the yellow colour on the screen and stopped her entering. Han was confused, even embarrassed, and stepped back outside the mall. Knowing that her cousin was already waiting inside the mall's restaurant, she walked around and found that the mall had security guards only for the main entrances and she could easily enter through the doors of a clothes shop.

She researched online and figured out that she needed to submit a 'yellow code complaint' (黄码申诉) via an app called 'Health 320' (健康 320) and then call the local helpline. She followed the steps, made

screenshots of all her PCR test results, submitted the complaint, then called the helpline. The person who answered the phone, however, told her that she had to do a third PCR test and upload the result: 'This is the only way we can change your health code to green. You see there are three PCR test time slots in the complaint form, so you must upload three PCR tests to fix your code; otherwise, we can't operate the system.' Han quickly located a hospital that had a 'yellow code PCR test centre' and did a test that night. After the test result came back negative, she submitted the complaint. The next day, her code did not automatically turn green as she was told it would. She called the helpline again for 'human service', and the person answering the phone changed the health code manually for her.

The second time Han visited Changsha, she did two tests in addition to the 'two PCR tests within three days of arrival' rule. It was the mid autumn holiday period (10–12 September) and the city was packed with tourists. Han's three friends visiting from other parts of China were not as cautious, as finding a PCR test spot had already cost them a lot of time and energy. On 12 September, the four of them were entering a mall and, when they scanned the venue code, one of Han's friends, Sherry, yelled: 'Oh no! Why is my health code yellow now? What should I do?' Sherry's train to Wuhan was in the afternoon and she needed to return to work the next day.

'Hunan in-province yellow code complaint' on the Health320 App.

As an experienced Changsha health code trouble-shooter, Han gave Sherry step-by-step instructions on how to deal with the situation. However, the helpline was extremely busy due to the holiday period. Han and her friends assumed that there were many people like Sherry who were hoping to travel to their home cities that day and had been given a yellow code. Sherry waited for 10 minutes in the phone queue, but the call was disconnected before she could speak to anyone. Sherry then tried to find and contact the community (社区) centre to which her hotel belonged, hoping at least for some clarification. However, after several unanswered calls to the community centre, the community worker finally picked up the phone and shouted: 'Stop calling! Don't you know we are having our midday rest now!' Sherry explained: 'But I am having an urgent situation. My health code is yellow and [the helpline] is busy, can you help me with this?' The community worker said no and hung up. She tried the helpline again and, after waiting 30 minutes, Sherry finally spoke to a human. After Sherry repeated her situation, the person double-checked that she was leaving Changsha that day and changed her health code to green. Sherry was eventually able to catch her train back to Wuhan, but everyone was exhausted.

The third time Han went to Changsha was in mid October with a friend, Jing. Due to previous lessons learned, they did a PCR test every day from day one. However, on the morning of 18 October—day three in Changsha—Jing received a message saying she and a Covid-19 positive case had 'come into spatiotemporal contact' (时空交集). As a result, they had to stay at home for seven days and take three PCR tests over the period. The place where Jing and the positive case had supposedly come into spatiotemporal contact was a quarantine hotel 6 kilometres from the Changsha North train terminal. Han and Jing had travelled together, but while Jing was given a yellow code, Han did not receive any texts. As Jing never went near the hotel, they believed this 'mistake' should be rectified immediately.

After Jing submitted her complaint via the Health320 app, they began calling the helpline. The call was answered after 50 minutes, but she was told the platform was undergoing maintenance, so they would not be able to change the code for Jing. Jing then called the Tianxin District Centre for Disease Control and Prevention as suggested. It was a personal mobile phone number managed by one person, which, unsurprisingly, was busy. Half an hour later, the person who answered the phone simply said: 'Contact your community centre to submit the yellow code complaint! We only check and pass the complaint submitted through communities.' They called the community centre, but no-one answered. As a local, Han knew where the community centre was,though she had never actually been there. It was just —a five-minute walk from her home, so Han and Jing decided to walk there.

After Jing explained her situation for the third time—now in person—the community worker said: 'Well, we can't submit your yellow code complaint unless you show a plane or train ticket to leave Changsha today. We only submit urgent complaints, such as if you need the green code to travel.' Jing tried to argue with the community worker, but another community worker who overheard their conversation said: 'You should follow the text. I am sure the yellow code is not wrong. There must be a reason you got the code. Think about where you have been.' Jing showed her the map, telling her it was not possible for a tourist to enter the quarantine hotel. The community worker paused for a second and said:

> You might be mistakenly given a code, but we don't know why and we can't undo it. You know, a lot of departments can give you a yellow code, but we don't have the power to give or cancel your yellow code. Right now, we only follow the red-head [official] instructions that require us to only submit urgent complaints to the district centre. This is not our area, go find someone else.

Jing and Han thought it was a problem of over-implementation (层层加码). They continued making calls to different departments until 5pm and learned that it was the Tianxin district-level government and not the Changsha city-level Centre for Disease Control and Prevention that required proof of immediate travel plans to handle yellow code complaints. Again, Jing felt exhausted and numb after numerous attempts to call different places. The only option for Jing seemed to be to continue doing PCR tests every day and stay home as a 'close contact' yellow code. The next morning, Jing received another official text on her mobile phone instructing her to report to the community centre because she was a non-local. Jing

thought that, after three PCR tests and this text, she could try the community centre again. Han accompanied Jing to the community centre and found the same community worker, whom they asked whether she might submit the yellow code complaint for Jing. The community worker took photos of Jing's ID and phone screen with the yellow code, saying she could try submitting it to the district, but it might not work. A few seconds after her submission, Jing's health code turned green. Both Jing and Han were surprised by the speed but felt relieved.

Pandemic Governance Meets Local Governance

For many Chinese cities, the health code infrastructure has promoted a form of digital governance that vaguely recalls the aspirations behind Shenzhen's 'smart city' label. Shenzhen has been the model city for digitally enabled pandemic control in terms of the governance structure and how labour has been organised. In Shenzhen, free PCR test centres for locals and visitors were shown on Baidu and Gaode electronic maps that integrated seamlessly with WeChat, with test locations updated frequently.

However, attempts to emulate Shenzhen have been spotty. In Changsha, it was difficult to find a test facility unless you were a local. Electronic maps showing the location and opening hours of testing facilities were poorly updated, and the fewer free PCR test booths were announced on district WeChat groups and public accounts, so one had to know where to look. In Changsha, there were many situations in which administrators and individuals worked together to find ways around the Covid-19 restrictions, like only guarding one door of public buildings, helping make calls to the district centre, or allowing citizens to operate despite being designated 'yellow'. In Shenzhen, the punishment for not following restrictions was more severe, perhaps because of larger outbreaks and an aspiration to create an all-encompassing pandemic governance regime.

Circumventing decisions made by the automated system required more effort in Shenzhen, where street-level bureaucrats were working with, rather than against, the health code. The health code appeared to work much as it was designed to in the smart city infrastructure of Shenzhen. In Changsha, the health code was also integrated with the existing bureaucracy, but—perhaps in the same way as other political campaigns—it was not always implemented the way it was 'supposed to be' and instead became another part of the policy implementation terrain that had to be navigated by officials and citizens alike.

In the everyday experiences discussed above, we see how the automatic and often incomprehensible changes to health code designations were bypassed manually and even in very personal ways. Sometimes the call centres worked as intended, but in many cases, personal contact with local authorities was required. In Changsha, Han found it to be a surprising advantage that she knew to which community her parents' home belonged—something she had not found much need to know earlier on, but to deal with the effects of the new regimes of pandemic governance, it suddenly became relevant, as the street-level bureaucrats were the ones who would eventually help her. Similarly in Shenzhen, because of the intensified personal surveillance during Covid-19, Hailing and her family came to know the data workers operating in their local area.

While many of the staff encountered by the authors of this essay were probably hired for the purpose of ensuring Covid-19 governance, they were still physically placed in the local community administrations or data worker management organisations, which in Shenzhen were in place well before the pandemic. Overall, existing local institutions were revitalised by the health code–testing regimes that emerged as a by-product of pandemic governance. Infrastructure for the health code is new, but if you have existing knowledge of who is who in a building block, it is reinforced by the institutionalisation of surveillance embodied in governance regimes such as those organised during a systemic crisis like the pandemic in China. ■

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