The Social and Economic Impacts of Covid-19 News in Thailand

Full report

Present to

Bangkok Post Public Company Limited

Prepared by
Sal Forest Company Limited
June 30, 2021

Contents

Figure Contents

Table Contents

Executive Summary

Although the term “fake news” (generally used to refer to misinformation, disinformation and malformation) has been around for a while, the emergence of social media which makes the distribution of information easy, fast and accessible to a massive number of people, made the issue and its impacts more prominent and pressing.

During 2020-2021, impacts of fake news in the context of the coronavirus pandemic have been among the most noticeable and concerning.

Fake news around Covid-19 surfaced in Thailand with the first wave of the virus in February 2020. Towards the end of the year, when the second wave of infections erupted, the misinformation intensified, with potentially greater impacts on people’s livelihoods due to ensuing panic around the virus.

This research seeks to review the literature on fake news in the context of the Covid-19 pandemic and study the social and economic impacts of two case studies; one about Chiang Rai going into a lockdown and the other about a sharp rise in infections in Samut Sakhon.

The review of the literature found an increasing volume of research on fake news during the Covid-19 pandemic. Alias et al. (2020), for example, explored and analysed 41 incidences of fake news and Covid-19. The study divided the impacts of fake news into five areas:

1. Health Impact

These include unfounded beliefs about miracle cures, including consumption of hot water, alcoholic drinks, honey, and human urine. Advice from uncertified health gurus could also cause public confusion and endanger lives and health.

2. Governance Impact

The rise of fake news means governments have to allocate resources to cope with it and limit its possibility to confuse the public while they still have to fight the outbreaks themselves.

3. Social Impact

Xenophobia specifically directed against people of Asian origin erupted in several Western countries. In Thailand, researchers detected discrimination against people who travelled from other areas or provinces, targeting them whether they were confirmed to be Covid-19 positive or just in a high-risk group.

4. Political Impact

Fake news could cause friction in international relations. A case in point is incidences of fake news causing rifts between the United States and China.

5. Legal Impact

More legal processes are involved when governments have to enact new laws to cope with the fake news phenomenon.

To gauge the social and economic impacts of fake news in the case studies in Chiang Rai and Samut Sakhon, the research team came up with a logic model to depict the trajectories of the news in question and draw assumptions about how it might affect the behaviours of stakeholders. After

that, the research team designed the online surveys to test the assumptions. The surveys were conducted from April to June, 2021. The research team also conducted in-depth interviews with stakeholders.

Key findings from the case studies include:

1. News that makes people panic, whether true or false, can compel people to change their behaviours. And when a large number of people change their behaviour because of a particular piece of news, it could have wider economic and social impacts.

   The impact chain is similar, as evidenced by the case studies in Chiang Rai and Samut Sakhon. Simply put, as long as people believe that the news or information they have received is true (whether or not it is in fact true) they react to it in a similar, predictable fashion.

2. The research team predicted that the social and economic impacts indicated in the case studies would include reduced spending by residents in the provinces and missing out on spending by visitors who decided to cancel their trips. The research team estimated that the drop in spending during the week when the news in question proliferated would result in fewer people going out and spending to the tune of 367-724 million baht in the case of Chiang Rai and 754-1,487 million baht in the case of Samut Sakhon.

   Regarding damage from cancellation of in-bound trips, the research team estimated the sum at up to 28 million baht in the case of Chiang Rai and 700,000 baht in the case of Samut Sakhon.

3. Social impacts from both case studies were deemed insignificant. Only 12% of participants in the Chiang Rai survey and 30% in the case of Samut Sakhon reported that they went to have a Covid-19 test after receiving the news.

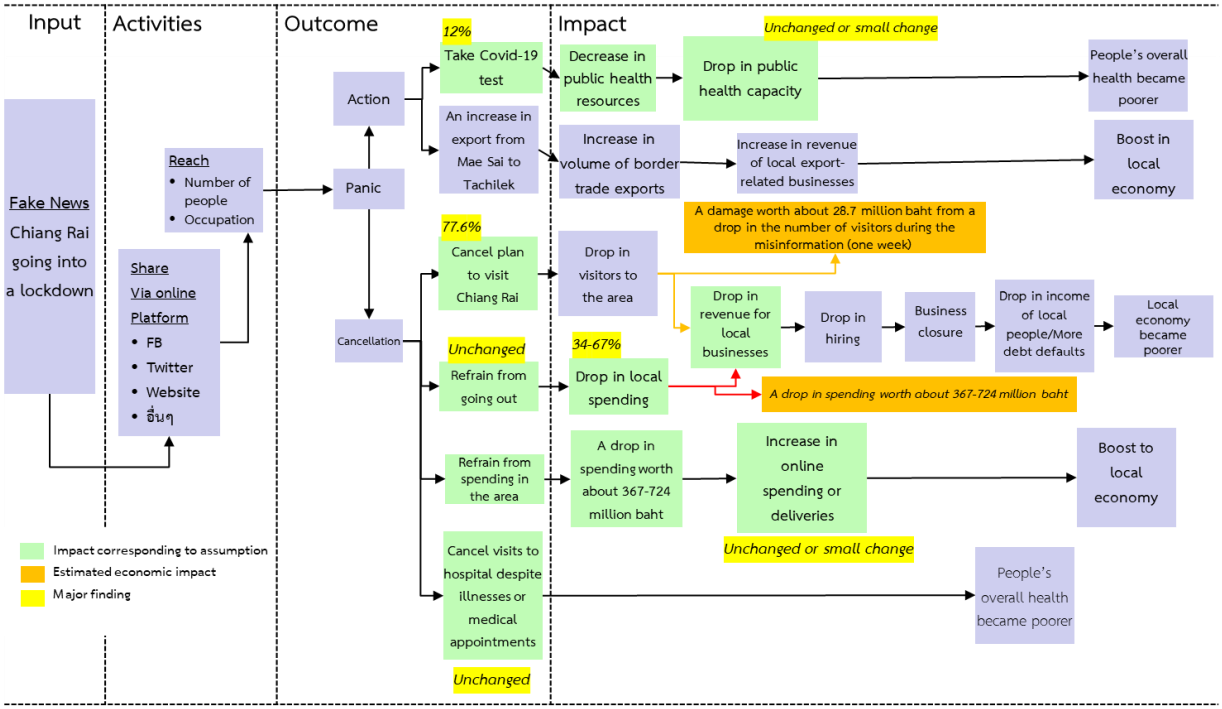
   Overall, medical personnel in both provinces already knew that the public health systems were stretched before the news came up. Moreover, during the period when the news surfaced, the number of residents of the two provinces and people planning to visit them seeking Covid-19 tests did not increase significantly. The impact primarily fell on general patients whose appointments were delayed. The research team did not have enough information for further analysis.

4. It was almost impossible to differentiate impacts from the particular news stories used in the case studies from those caused by other factors during the week the news was publicised. These factors included other news stories and measures issued by the government during the period. News does not occur in a vacuum or in an environment that is free of other news stories. News occurs amid a myriad of factors and other news items. Often, it is not clear whether a change in people's behaviour is caused by misinformation or what truly happened. For example, in the case of Chiang Rai, a representative from the hotel association expressed the view that news about infected people crossing into the country illegally from Myanmar had sent reservations plummeting before the misinformation pushed them down further. Since they occurred in close succession and are directly related, it was nearly impossible to distinguish the impacts from the two groups of news.

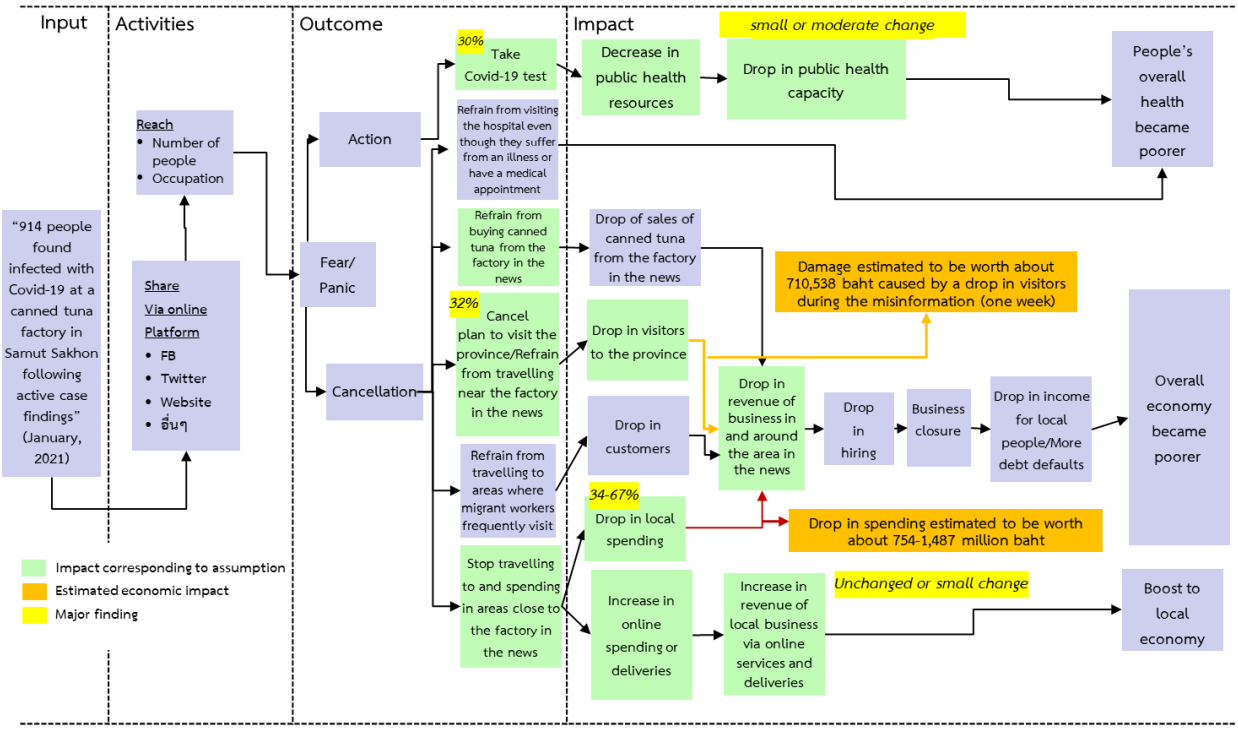
5. It is possible that, as time passes, impacts from Covid-19 misinformation would diminish both in terms of size and variety. This is because business operators and the public in general have adapted to the pandemic since it first started in early 2020. In other words, people have become familiar with the outbreak. An example can be found in the Samut Sakhon case study where half the business operators adjusted themselves by terminating staff contracts or reducing wages and/or work hours since the start of the Covid-19 outbreak, before the fake news broke out.

The following charts summarise the social and economic impacts of the Chiang Rai and Samut Sakhon case studies. The green boxes show the impacts gleaned from the surveys according to the logic model assumptions. The italics show major findings under the topic according to the survey. The green boxes show estimates of the economic impacts based on information from the surveys and statistics from the National Statistics Bureau.

Results of the economic and social impact assessment from the false claims in Chiang Rai



Results of the economic and social impact assessment from the misleading news in Samut Sakhon



For future “fake news” studies, the research team recommended that the survey be conducted as soon as the misinformation gets out. This is because “fake news” has a short lifespan, sometimes only lasting a few days before it is corrected. Also, it is difficult to discern the direct impacts of “fake news” from other factors.

Chapter 1: Introduction

1.1 Background and Significance

Although the term “fake news” (generally used to refer to misinformation, disinformation and malformation) has been around for a while, the emergence of social media which made the distribution of information easy, fast and accessible to a massive number of people, made the issue and its impacts more prominent.

Impacts from Covid-19 misinformation have come so fast and furious that the World Health Organization (WHO) came out and called it an “infodemic” – an epidemic of information that could be as damaging as the pandemic itself.

That the concerns were raised quite soon after Covid-19 started to spread to countries around the world shows it is a significant phenomenon whose impacts could indeed be as severe as the actual pandemic.

The infodemic not only makes it more difficult for the public, policy makers and medical personnel to access trustworthy sources of information but also amplifies people’s worries, causing depression and other mental problems. When faced with an overabundance of information, some accurate and others less so, most people could not comply with essential basic guidelines. The flood of information also disrupted their decision-making processes, especially when they have to act urgently without having enough time to collect or process the relevant data (Pan American Health Organization, 2020).

In Thailand, fake news surfaced with the first wave of the virus in February 2020. Towards the end of the year, when the second wave of infections erupted, the misinformation intensified to a level that could potentially have greater impacts on people’s livelihoods due to the heightened sense of panic.

This research seeks to review the literature regarding fake news during the Covid-19 pandemic and study the social and economic impacts in two case studies, one about Chiang Rai going into a lockdown and the other about a sharp rise in infections in Samut Sakhon.

1.2 Objectives and Scope

The research seeks to review existing literature about impacts of Covid-19 misinformation and assess social impacts of news about Covid-19 in two case studies, namely, misinformation about the Chiang Rai lockdown that proliferated during the first week of December 2020, and a possibly misleading item about a large number of new infections in a canned tuna factory in Samut Sakhon province that arose from towards the end of December 2020 to early January 2021.

1.3 Review of Literature

Dissemination of Covid-19 Misinformation

A number of researches have studied how “fake news” about Covid-19 is disseminated[1]. For example, Pulido et al. (2020) studied 1,000 tweets to determine if there was more science-based information than fake news. They found that false information is more tweeted (brought into the platform) than facts. The research found that there were almost twice as many fake news items than fact-checked items. However, the false information was circulated more slowly, as science-based information is generally retweeted more. This finding is in contrast to earlier studies that suggest that fake news always travels faster in terms of retweets and tends to be more pervasive.

Bergman et al. (2020) expanded the research further by comparing dissemination of fake news on traditional and social media. The study used nearly 2.5 million tweets related to Covid-19 in Canada and more than 9,000 articles from the country’s 19 news websites. It found that false information was circulated more on social media than traditional media which mostly published fact-checked information.

What Motivated People to Share False Information

Social media has played a crucial role in shaping people’s perceptions during the pandemic. A growing body of research looks into people’s behaviours around sharing false information on social media. Research by Islam et al. (2020) studied the motivational factors that increase the tendency of people to share unverified Covid-19 information.

The study focused on two motivational factors, namely, self-promotion and entertainment, and three personal attributes, namely, exploration, deficient self-regulation[2], and religiosity. The analysis was based on an online survey of opinions of 433 young adults in Bangladesh.

The study found that deficient self-regulation and self-promotion have significant effects on unverified social media sharing. The effect of exploration is negative, meaning people who like to explore what they don’t know have a small chance to share Covid-19 misinformation.

According to the research, deficient self-regulation and self-promotion are the strongest predictors of social media fatigue. Meanwhile, one of the motivational factors in sharing of unverified false information is entertainment to bring relief from social media fatigue.

However, the sharing of false information may not necessarily stem from negative purposes. People who spread false information could assume that recipients will benefit from it without verifying it. Misinformation in this category is usually about how to guard oneself from dangers. A study by Apuke and Omar (2020) on motivational factors in misinformation sharing among Facebook and WhatsApp users in Nigeria found that altruism is the strongest motivation in the sharing of Covid-19 misinformation among social media users. In this respect, the behaviour is also inspired by a need to maintain social cohesion (Alias, 2020).

Still, the sharing of misinformation or unverified news about Covid-19 may not have to do with the above motivational factors or personal attributes but stem from information overload and naïve trust in online information (Late et al., 2020).

Poor truth discernment also plays a role in the sharing of misinformation. Research by Pennycook et al. (2020) involving 1,700 adults in the United States recruited online, showed that a failure to think sufficiently clearly whether or not content is accurate is a major factor in the sharing of false

[1] The term is used to refer to misinformation false information, disinformation and infodemic except where specified otherwise.

[2] Deficient self-regulation, or DS-R, refers to people who become confused when faced with a need to regulate their responses. They tend to make decisions based on external stimulants or personal behaviour without prior planning, organisation or application of information. (Wheland et al., 2020a referred to in Islam et al., 2020)

claims. The research also suggested that a simple process of nudging people to think about accuracy can improve their choices of what they share online.

Impacts of Covid-19 Misinformation

A review of literature concerning social impacts of false news and information about Covid-19 indicates that the most relevant is the Meta-Analysis by Alias et al. (2020, December). The study seeks to identify the subject areas of research related to fake news on Covid-19 and the impacts caused by the misinformation phenomenon.

The study explored 41 documents published in the SCOPUS online database related to fake news and Covid-19. It divided the impacts into five areas.

1. Health Impacts

The effect resulted from beliefs in certain magic cures for diseases, including consumption of hot water, alcoholic drinks, honey, or urine. Also, the health impact could be caused by recommendations from uncertified health gurus that ended up confusing people and endangering their lives. One example is a case in Iran where over 100 people died after consuming methanol out of the false belief that it could cure Covid-19.

Besides physical health, an overabundance of Covid-19 information affects people's mental health, as evident from an increase in hypochondria that, in turn, increases the risk of being affected by the disease (Islam et al, 2020 cited in Alias, 2020) while contributing to the misinformation phenomenon (Late et al., 2020 cited in Alias, 2020).

2. Governance Impacts

The spread of misinformation compelled governments to allocate considerable resources to identify and cope with false news and information that has widespread impacts on the public at a time when they have to fight the pandemic and ensure effective distribution of necessary information and health guidelines (Rodrigues and Xu, 2020 cited in Alias, 2020).

Without consistent responses to what can be trusted and how to best respond to the flood of information, the result is a widespread outbreak of misinformation and failure by governments to tackle the pandemic (Ribeiro et al., 2020 cited in Alias, 2020).

3. Social Impact

Xenophobia, especially hatred directed against Chinese and other Asian people wrongly believed to be sources of the pandemic, became evident in several Western countries. The bigotry led to discrimination, stigmatisation, and even hate crimes against members of the groups. The phenomenon caused the victims to have a tendency to conceal information necessary for treatment or tracking-and-tracing (Shimizu, 2020; Mejova & Kalimeri, 2020; Rovetta & Bhagavathula, 2020) cited in Alias, 2020).

In Thailand, rather than racial discrimination, the research team found examples of discrimination against people who travelled from upcountry or provincial areas, whether suspecting them of being confirmed Covid-19 cases or among high-risk groups (Manager Online, December 22, 2020 and Khaosod Online, April 3, 2020).

4. Political Impact

The spread of misinformation can affect international relations, i.e. the use of fake news as a tool by the United States and China to damage each other's reputations (Moscadelli et al., 2020 cited in

Alias 2020). Another research found that this type of fake news played a role in exacerbating the spread of pre-existing conspiracy theories in the realms of international politics (Calvillo et al., 2020 cited in Alias, 2020).

5. Legal Impact

The information disorder can lead to a change in legislation. A case in point is Peru which enacted a stringent law governing the production and dissemination of information in order to curb the spread of fake news. Those found guilty of producing or propagating fake news would be subject to 3-6 years imprisonment. The strict legislative response made Peru one of the most successful countries in curbing the infodemic (Alvariz-Risco et al., 2020 cited in Alias, 2020).

The research team could not find many studies of the economic impacts of false information, let alone any empirical ones. The reason could be that the pandemic remains far from over, making it difficult to apply research methodology that distinguishes the economic impacts of the misinformation from the Covid-19 pandemic.

Impacts of Covid-19 on Truth Discernment

Bridgman et al., (2020) conducted a nationally representative survey of 2,500 Canadian citizens to study how misperceptions regarding Covid-19 affected their disease and risk perceptions as well as social distancing compliance.

The study found that people who are more exposed to social media (where more misinformation can be found) are associated with:

1. More misconceptions about the virus

2. Less social distancing compliance

These findings are opposite to people who are exposed to news media who are associated with fewer misconceptions about Covid-19 and more social distancing compliance.

The misconceptions regarding the virus are in turn associated with lower risk perceptions.

Kim et al., (2020) is a research based on a survey of around 3,000 samples in the United States, South Korea and Singapore, that seeks to determine if exposure to misinformation affects discernment of true information.

The results show that misinformation exposure reduces information insufficiency, which subsequently leads to a decrease in the search for information, even to the point of information avoidance, due to the misunderstanding that one already has enough information to guard against the disease or to go about one's daily life.

Responding to Misinformation and Corrective Measures

Curbing and correcting misinformation may not be as simple as generally believed since the consumer could believe that the false information was true and have no awareness that it could be false. For example, Walter & Tukachinsky (2020) conducted a meta-analysis on 32 studies involving 6,532 sample groups.

The study revealed that correction does not entirely eliminate people's belief in misinformation. It also indicated that corrective messages from credible sources are less effective than those delivered from the source of the misinformation itself. Besides, corrective messages are found to be more successful when they are consistent with the audience's worldview. The study suggested that

people hold onto false information because they tend to choose to consume more misinformation that is comprehensive in terms of content, than true information that is incomplete (Johnson & Seifert, 1994 cited in Walter & Tukachinsky, 2020).

Corrections are less effective when there is a time lag between the delivery of the misinformation and correction. The longer the recipient of false information holds on to it, the more deeply the falsehood is likely to be absorbed into their memories, which makes it more difficult to correct or expunge. (Ecker, Lewandowsky, Cheung & Maybery, 2015 cited in Walter & Tukachinsky, 2020).

For these reasons, it is essential to ensure that the corrective messages are explanatory, factual and based on evidence in terms of content while communicating in ways that make people understand the issue better and clear up their doubts. Speed of correction must also be taken into account. The faster corrective messages are delivered, the better the chance of effectively curbing the misinformation.

1.4 Framework and Methodology in Studying Social Impacts of Fake News

To gauge the social impacts from a perception of misinformation in the specific cases of Chiang Rai and Samut Sakhon, the research team began by mapping a logic model designed to show sensible relationships between perception of the misinformation and possible effects on stakeholders.

Logic models usually comprises four elements. The first element is a perception of the information or input which in the case studies is the perception of the misinformation by stakeholders. After that, assumptions are made as to how the perception of the misinformation would cause a change in the behaviour of the stakeholders or activities. Then, the team analysed what outcomes could result from the behavioural change. Finally, the research team connected the outcomes with possible impacts.

To test the assumptions based on the logic model, the research team conducted online surveys among different groups of stakeholders from late April to mid-June 2021, along with in-depth interviews with representatives from stakeholder groups, including chambers of commerce, associations of operators in the tourism sector, and medical personnel in hospitals located in the targeted provinces.

To ensure that the results are realistic, the online surveys do not specify that the studies are geared towards “fake news”. As such, the studies only required the perception and responses to the news items in question by participants, without them having to know whether or not it is “fake news”.

Chapter 2: Summary of Survey Participants

2.1 Case study concerning misleading news in Chiang Rai

The research team distributed an online survey on "The Influence of Misinformation about Covid-19 on Daily Behaviour: The Case Study of Chiang Rai" from May 6, 2021 to June 23, 2021. The stakeholders were divided into five groups according to the logic model (see more in Chapter 3).

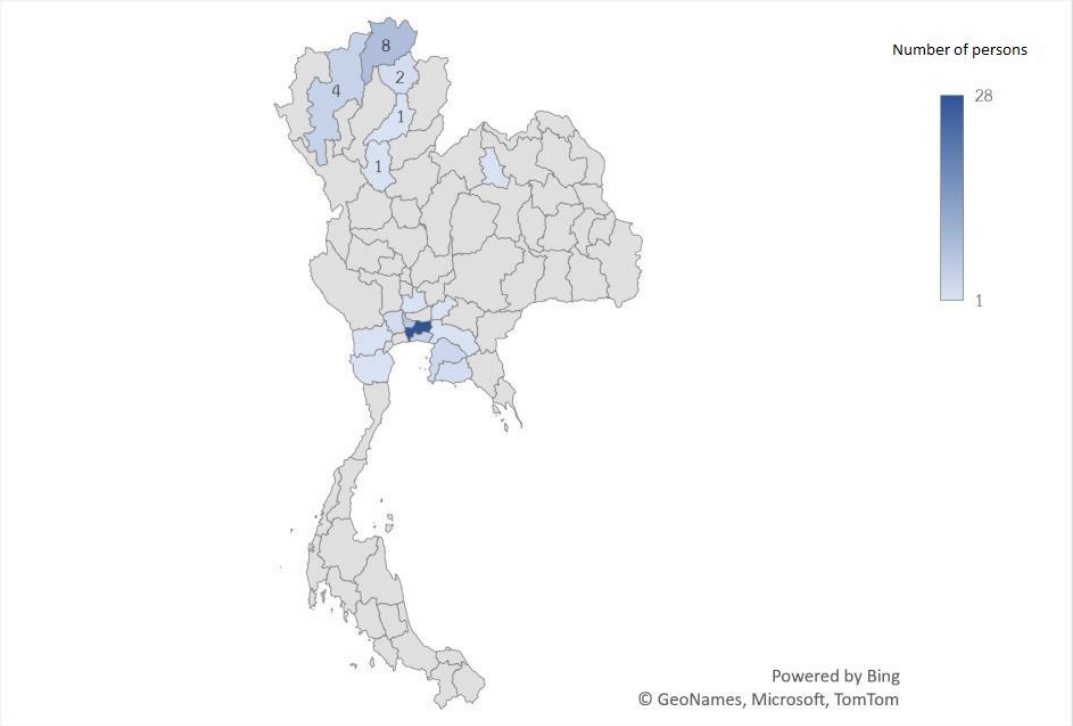
The survey found 157 stakeholders who participated in the survey had seen the misinformation about the Chiang Rai Lockdown. Among them, 67 are non-residents, 30 are Chiang Rai residents, 35 are business operators in Chiang Rai, 16 are medical professionals outside Chiang Rai and 9 are medical professionals in Chiang Rai.

Details of the stakeholders are as follows:

2.1.1 Non-residents of Chiang Rai

Among 67 survey participants who do not live in Chiang Rai, 28 reside in Bangkok, 6 in Nonthaburi, 8 in Chiang Rai[3], 2 in Rayong, 4 in Chiang Rai and Samut Prakan, 3 in Chon Buri, 2 in Rayong, Nakhon Pathom and Payao, and 1 in Ayutthaya, Phetchaburi, Ratchaburi, Sukhothai, Nong Bua Lam Phu, Chachoengsao, Nakhon Nayok and Phrae, as shown in Figure 1.

Figure 1: Habitats of non-residents of Chiang Rai (persons)

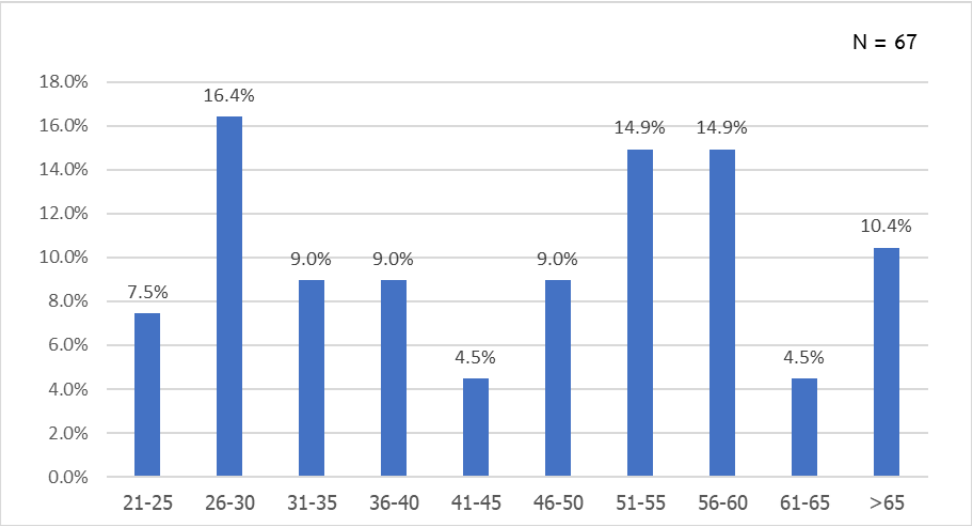


Source: Sal Forest

[3] Since the respondents were asked both which province they currently reside in and their current location, the answers could be incongruous. For example, some respondents might pick the wrong province or were staying out of Chiang Rai at the time the news proliferated. In this case, the research team adhered to the respondents' answers in defining which sample groups they belong to.

Respondents who are non-residents of Chiang Rai are between 21-79 years old with an average age of 45. Most respondents are between 26-30 years old (11 or 16.4%), followed by those who are 56-60 and 51-55 (11 or 14.9% each). There are 7 respondents who are more than 65 years old (10.4%) and 6 respondents in each of the 31-35 years old, 36-40 years old, and 46-50 years old groups. Five respondents are between 21-25 years old (7.5%) and three are in each of the 41-45 years old and 61-65 years old (4.5%) groups (Figure 2).

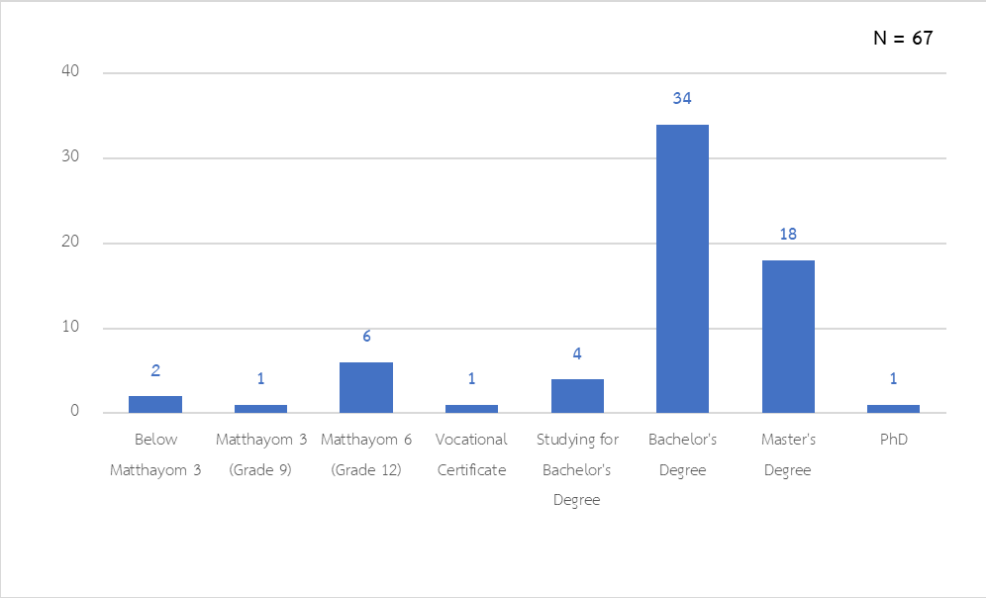
Figure 2: Age of non-residents of Chiang Rai (percent)



Source: Sal Forest

In terms of education, a majority of respondents, 34, are bachelor's degree holders (50.7%), followed by 18 master's degree holders (26.9%). 6 respondents finished secondary school (9%), 2 did not finish Matthayom 3 (3%), and 1 finished Matthayom 3 (1.5%). One respondent has vocational education (1.5%), 4 are studying for a bachelor's degree (6%) and one has a doctoral level education (1.5%). All as shown in Figure 3.

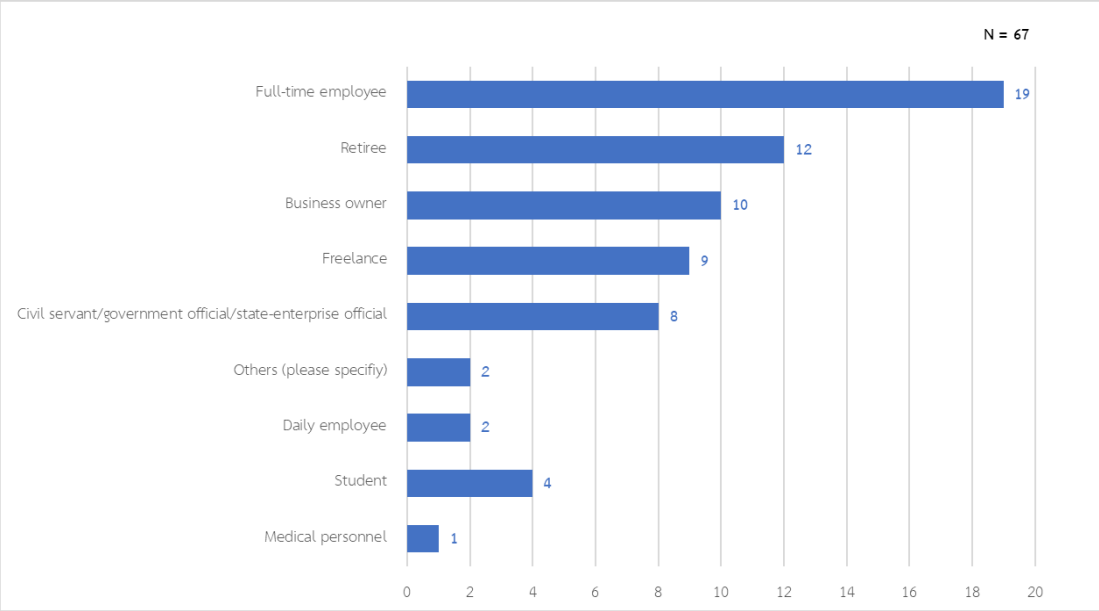
Figure 3: Education level of non-residents of Chiang Rai (persons)



Source: Sal Forest

Most respondents, 19, are company employees (28.4%), 12 are retirees (17.9%), 10 are independent workers or freelancers (13.4%), 8 are officials, state employees and state enterprise employees, 2 are wage earners (3%), 1 is a medical worker (1.5%), and 4 are students (6%), as shown in Figure 4.

Figure 4: Occupation of non-residents of Chiang Rai (persons)

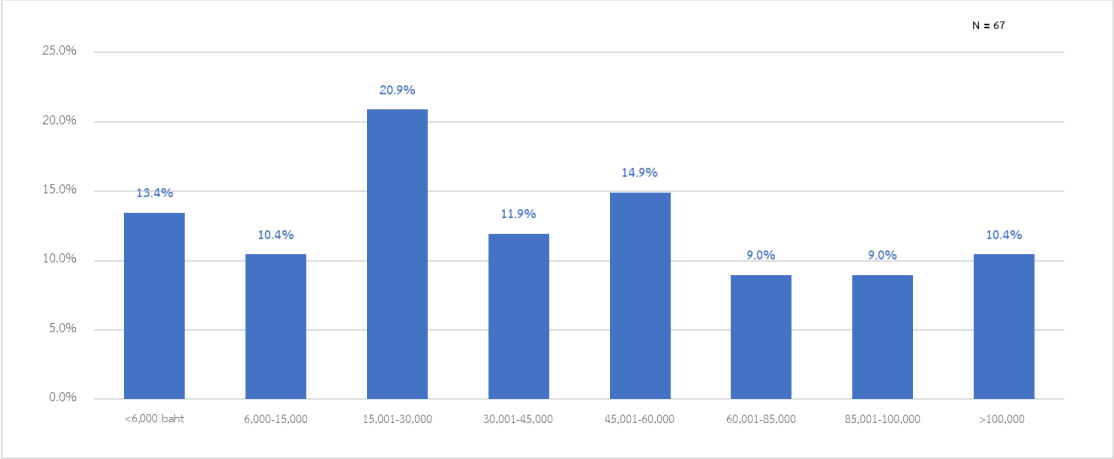


Source: Sal Forest

In terms of income, 14 respondents reside in Chiang Rai whose income is between 15,000-30,000 baht per month (20.9%), 8 between 30,001-45,000 baht (11.9%), 10 between 45,001-60,000 baht (14.9%), and 7 have an income of more than 100,000 baht per month (10.4%).

Among the respondents, 9 have an income of less than 6,000 baht per month (13.4%), 7 between 6,000-15,000 baht (10.4%), 6 between 60,001-85,000 baht (9%), and 6 between 85,001-100,000 baht (9%), as shown in Figure 5.

Figure 5: Income of non-residents of Chiang Rai (percent)



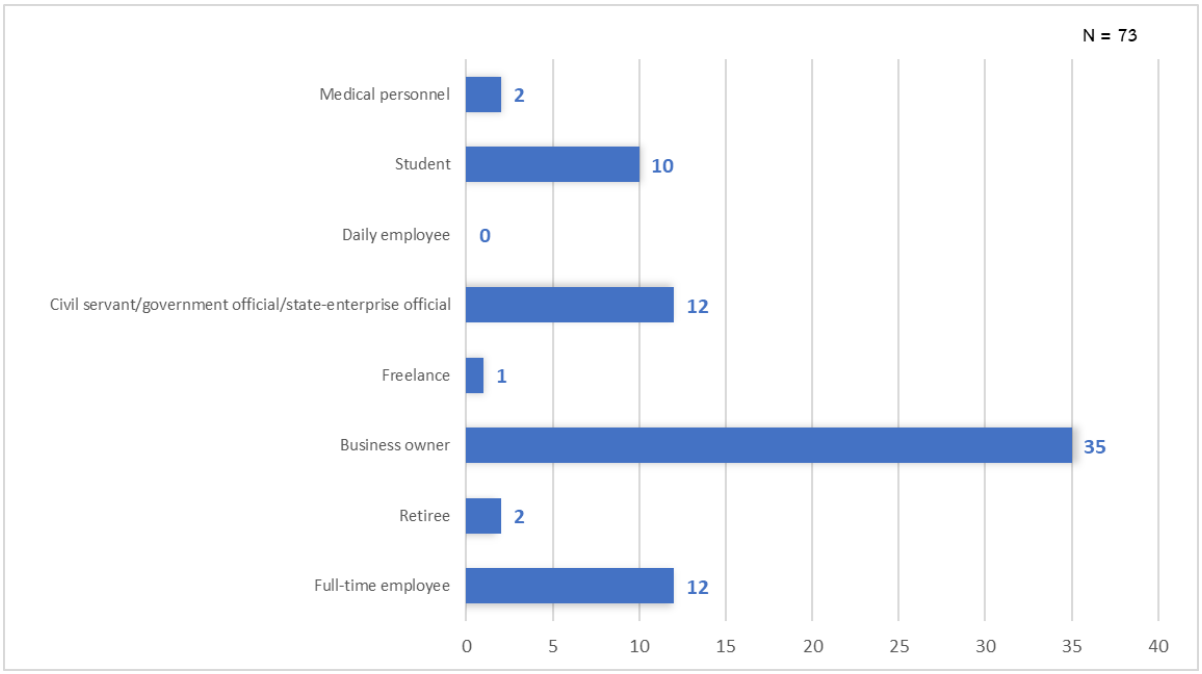
Source: Sal Forest

2.1.2 Chiang Rai residents

A total of 73 people[4] took part in the survey, aged 20-77 years old with an average age of 43. Among them, 45.2% are female and 49.3% male. 4.1% declined to specify.

Most respondents to the survey who live in Chiang Rai, 34, are business owners (47%), 12 each are government officials, state employees, state enterprise employees, or company employees (16%), 10 are students (14%), 2 are retirees and medical staff each (3%), and 1 is a freelancer (1%). There was no daily wage earners among the sample group. All as shown in Figure 6.

Figure 6: Occupation of residents of Chiang Rai (persons)

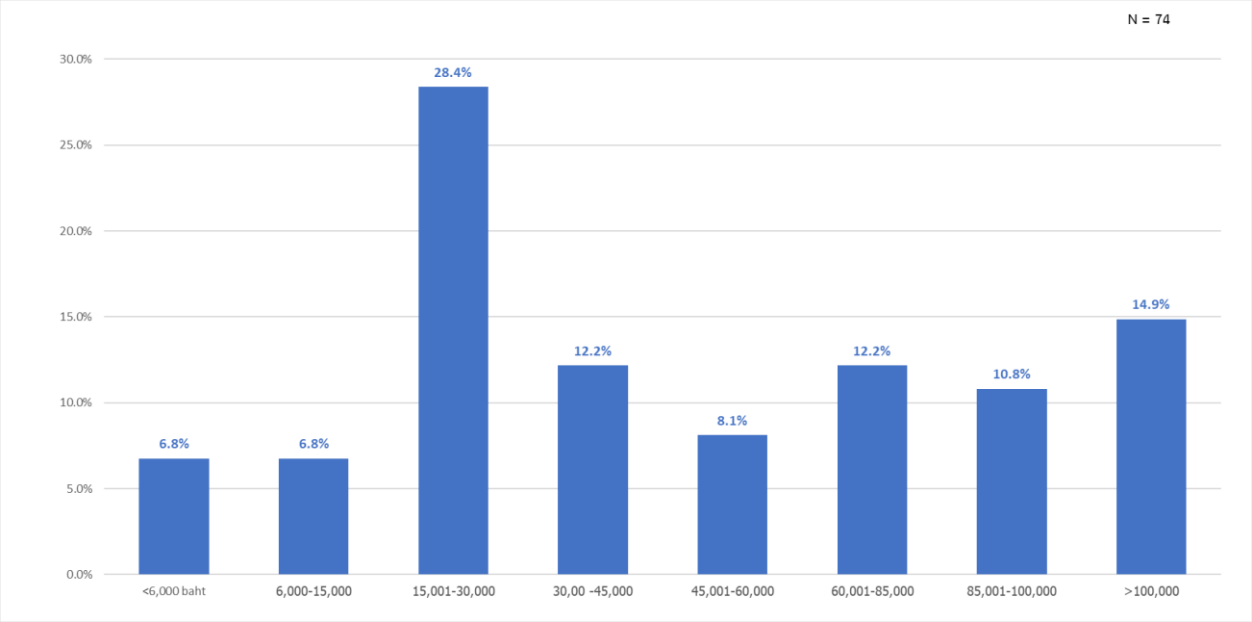


Source: Sal Forest

In terms of income, 20 respondents to the survey are also Chiang Rai residents whose income is between 15,0001-30,000 baht per month (27.4%), 11 have more than 100,000 baht income per month (15.1%), 9 each have between 60,001-85,000 baht and 30,0001-45,000 baht (12.3%), 6 have between 45,001-60,000 baht (8.2%) while 5 each have less than 6,000 baht per month and 6,000-15,000 baht per month (6.8%). All as shown in Figure 7.

[4] Out of the 73 respondents who are Chiang Rai residents, 43 are counted as business operators or medical workers inside the province. Since the number of the respondents is small, the results remain inconclusive.

Figure 7: Income of residents of Chiang Rai (percent)



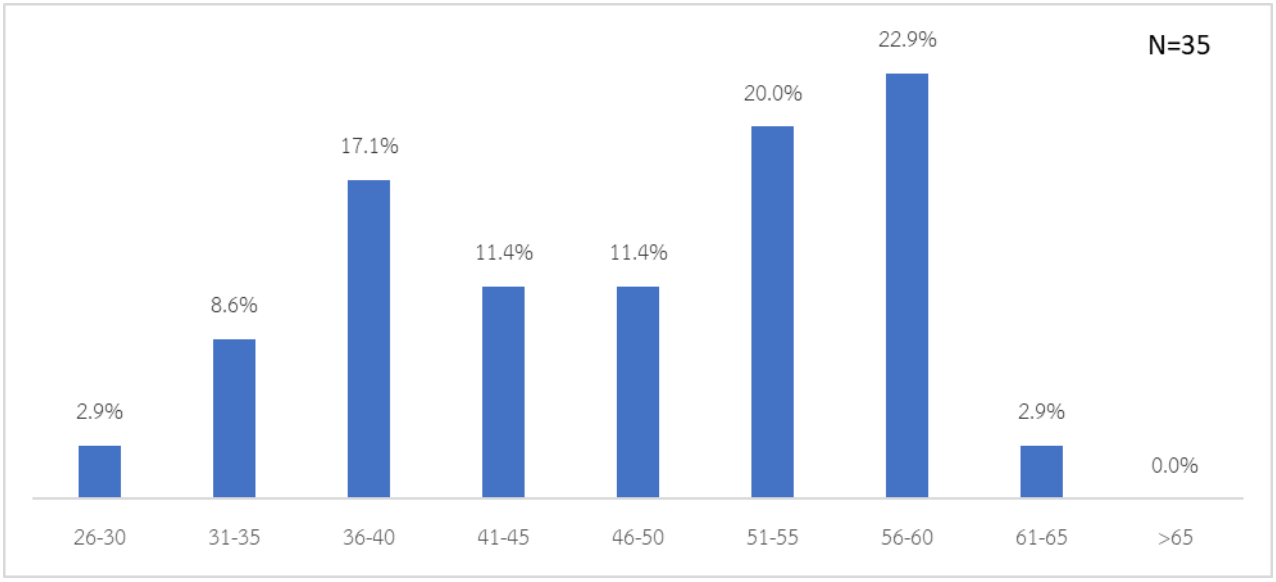
Source: Sal Forest

2.1.3 Chiang Rai business operators

Among the respondents, a total of 35 are business operators in Chiang Rai, aged 21-62. Most of them, 8, are 56-60 years old (22.6%), 7 are 51-55 years old (20.6%), 17.1% are 36-40 years old, 11.4% are 41-45 years old, 11.4% are 46-50 years old, 8.6% are 31-35 years old, 2.9% are 21-25 years old, and 26-30 and 61-65 years old, as shown in Figure 8.

A majority of participants, 21, are male (60%), 13 are female (37.1%), and 1 respondent did not specify gender (2.9%).

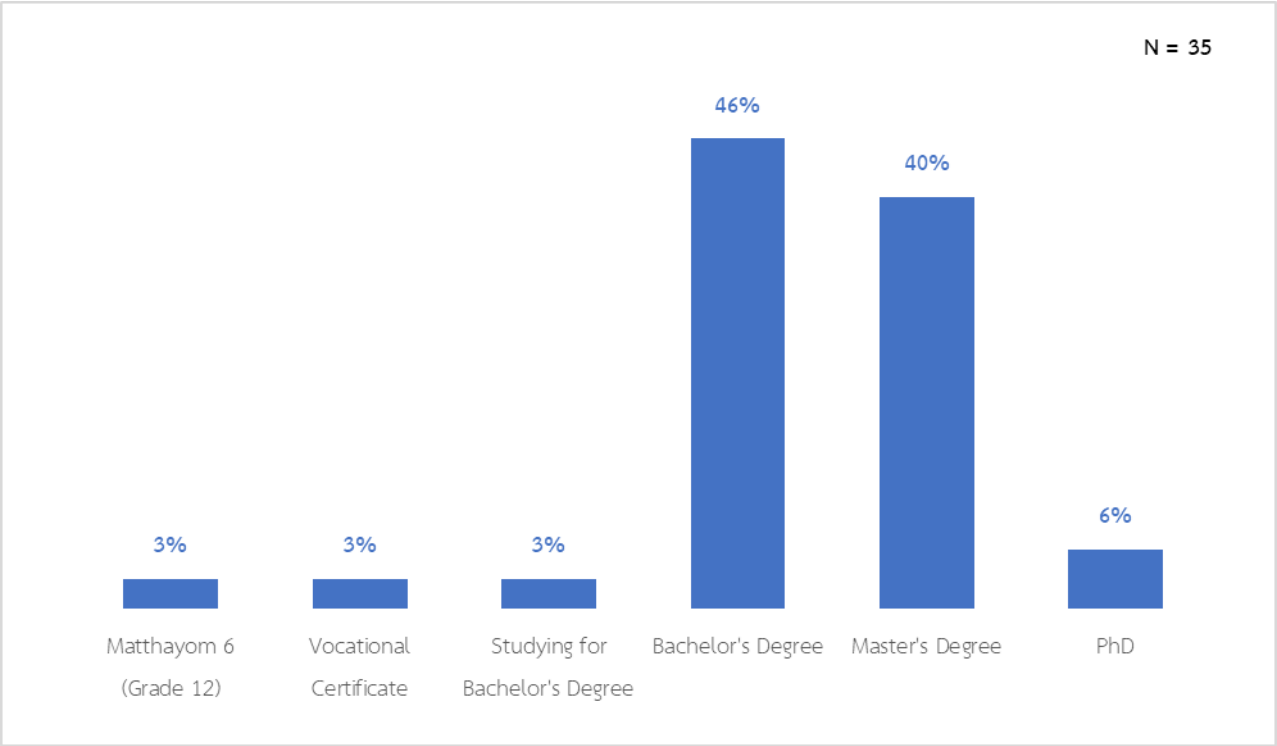
Figure 8: Age of business operators in Chiang Rai (percent)



Source: Sal Forest

Most of the respondents, 16, have a bachelor's degree (46%), 14 have a master's degree (40%), 2 have a doctorate degree (6%), 1 each is at Matthayom 6 (3%), vocational school (3%), and studying towards a bachelor's degree (3%), as shown in Figure 9.

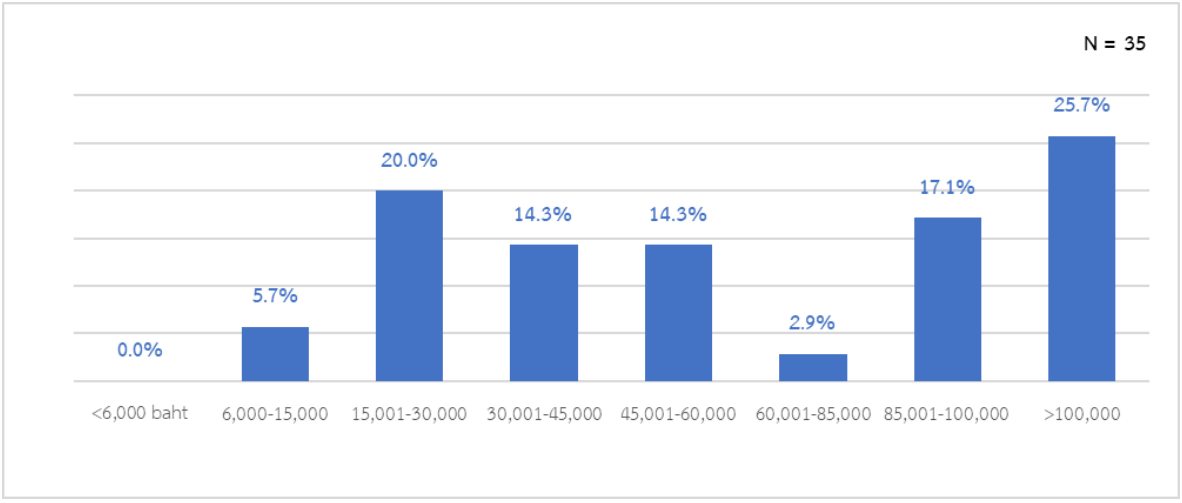
Figure 9: Level of education of business operators in Chiang Rai (percent)



Source: Sal Forest

In terms of income, among the respondents 9 business operators in Chiang Rai have more than 100,000 baht (25.7%), 7 have 15,001-30,000 (20%), 6 have 85,001-100,000 (17.1%), 5 have 30,0001-45,000 (14.3%), 5 have 45,001-60,000 baht (14.3%), 2 have 6,000-15,000 baht (5.7%) and 1 has 60,0001-85,000 baht (2.9%), as shown in Figure 10.

Figure 10: Income of business operators in Chiang Rai (percent)

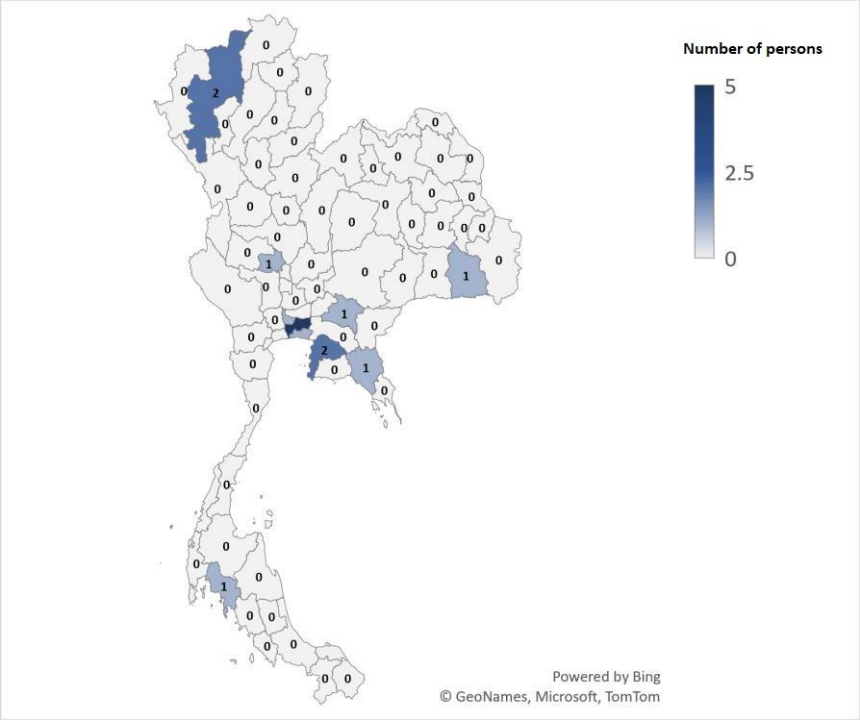


Source: Sal Forest

2.1.4 Medical personnel outside Chiang Rai

Among 16 medical personnel outside Chiang Rai[5] who participated in the survey, most, 5, are based in hospitals in Bangkok (31%). The rest are based in different regions; 2 each in Chiang Mai and Chon Buri, and 1 each in Samut Prakan, Nonthaburi, Chanthaburi, Krabi, Chai Nat, Prachinburi and Si Sa Ket. All as shown in Figure 11.

Figure 11: Hospitals where medical personnel outside Chiang Rai are based (persons)



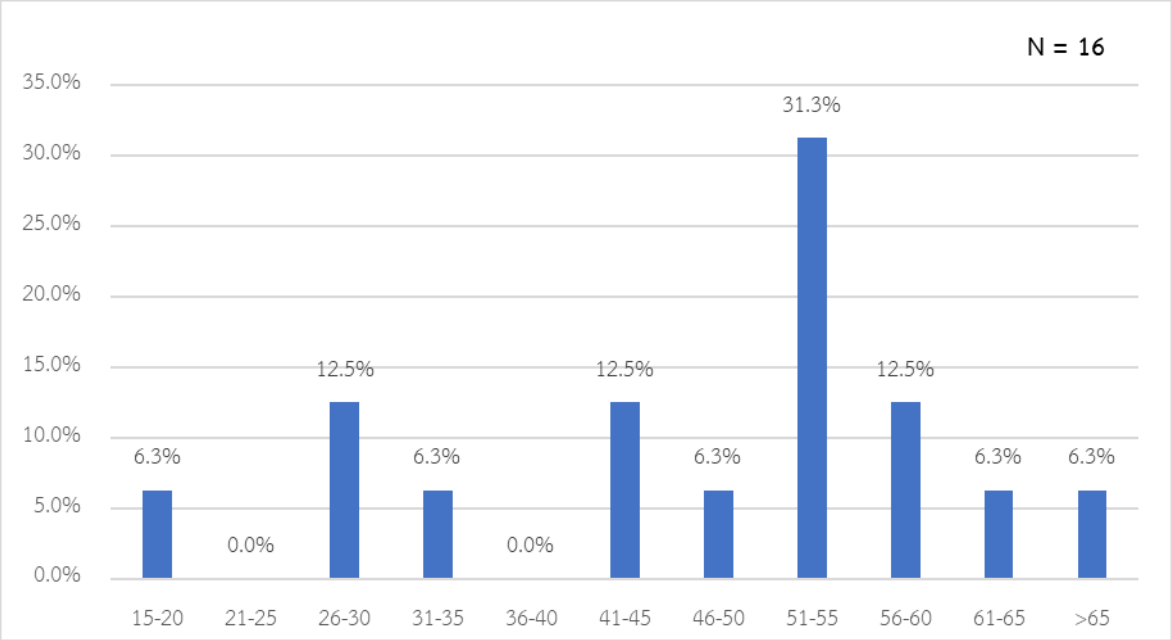
Source: Sal Forest

Overall, respondents in the medical personnel group are aged 20-76, with an average age of 48. Most, 5, are 51-55 (31.3%), 2 are 26-30 (12.5%), 41-45 (12.5%), 56-60 (12.5%) while 1 each is 15-20, 31-35, 46-50, 61-65 or over 65 (6.3%). All as shown in Figure 12.

Half of the respondents in this group, 8, are male (50%), 7 are female (43.8%), and 1 chose 'others' (6.3%).

[5] Since the number of participants is small, the results could deviate from reality.

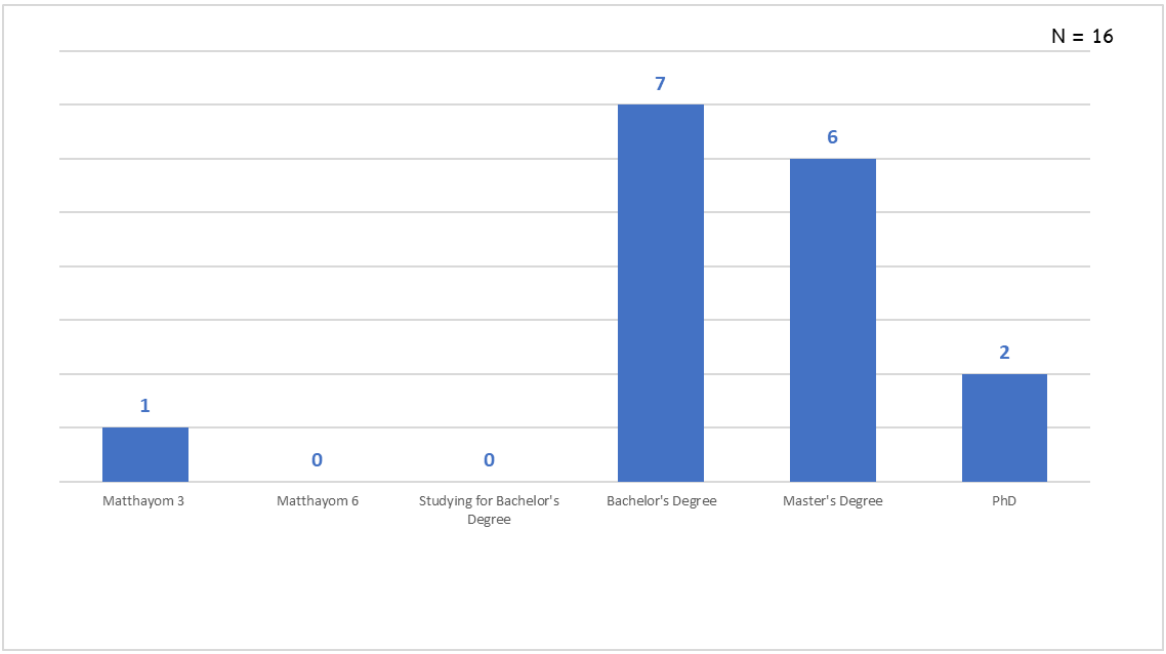
Figure 12: Age of medical personnel outside Chiang Rai (percent)



Source: Sal Forest

Half of the medical personnel, 7, are bachelor's degree holders (50%), 6 are master's degree holders (38%), 2 are PhD holders (13%) while 1 has a Matthayom 3 education, as shown in Figure 13.

Figure 13: Level of education of medical personnel outside Chiang Rai (percent)

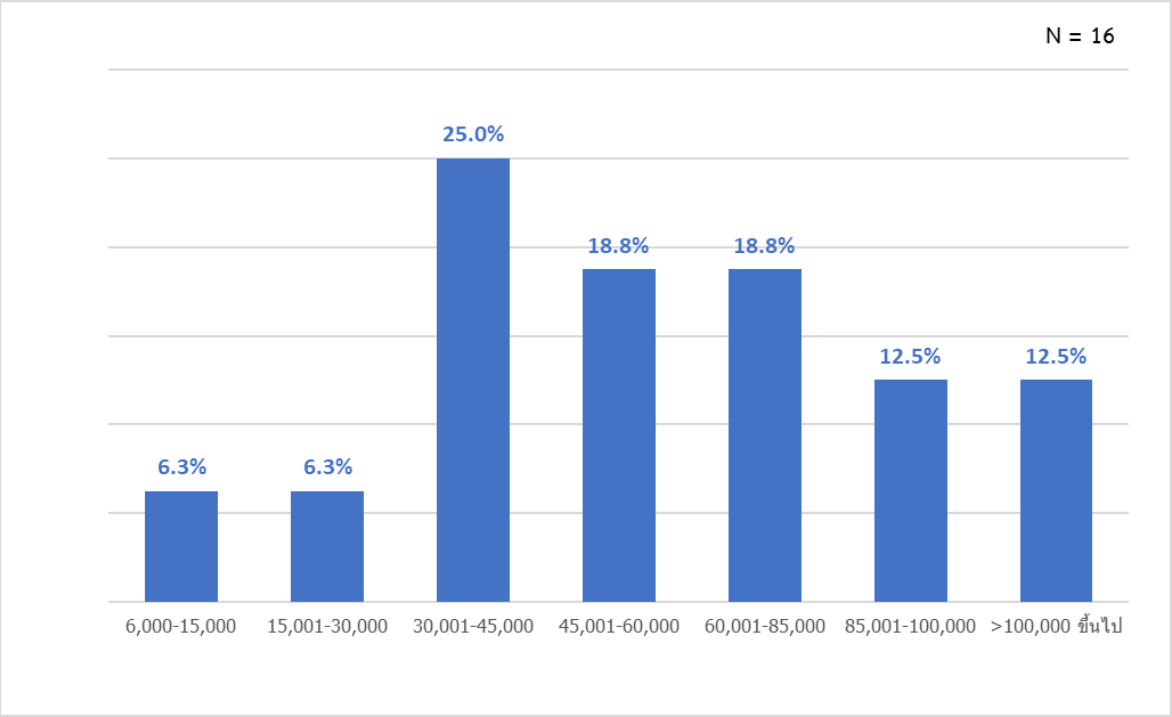


Source: Sal Forest

One fourth of the medical personnel, 4, have an income between 30,001-45,000 baht per month (25%), 3 between 45,001-60,000 (18.8%), 3 between 60,001-85,000 (18.8%), 2 each between

85,001-100,000 and over 100,000 baht each (12.5%), and 1 each between 6,000-15,000 baht and 15,001-30,000 baht (6.3%), as shown in Figure 14.

Figure 14: Income of medical personnel outside Chiang Rai (percent)



Source: Sal Forest

2.1.5 Medical personnel in Chiang Rai

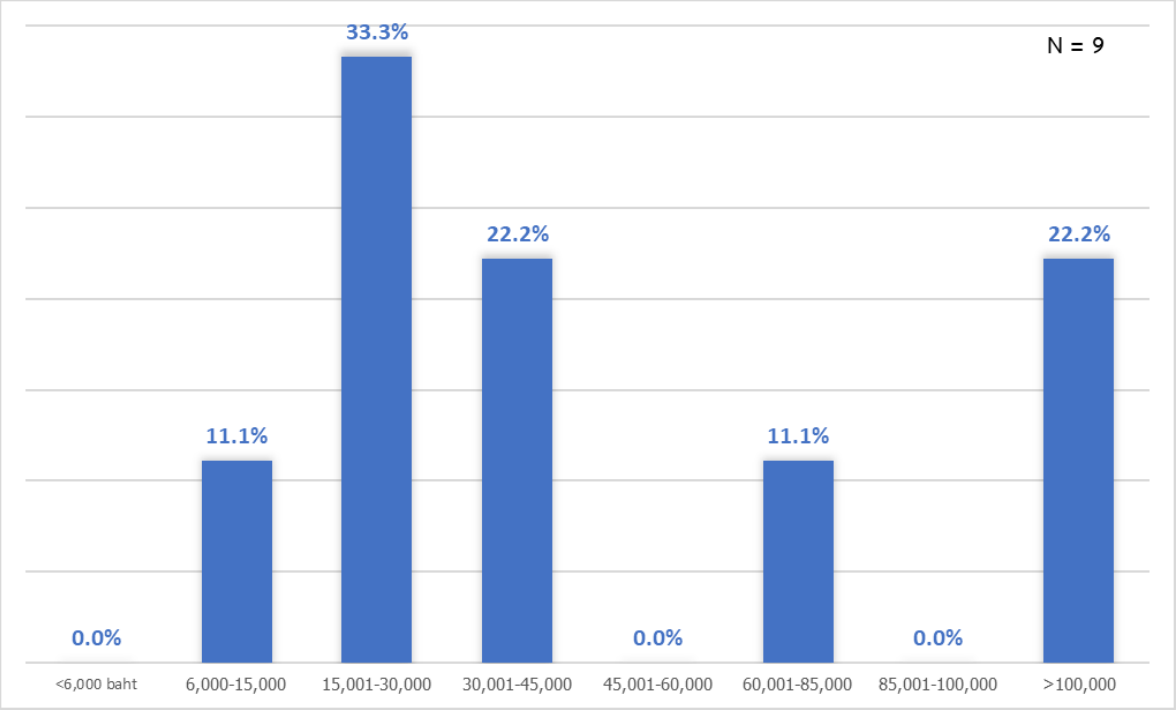
A total of 9 medical personnel in Chiang Rai[6] joined the survey. Among them, 2 are male (22.2%), 6 are female (66.7%) and 1 did not specify gender (11.1%). The respondents are aged 25-59, with an average age of 40. Most, 3, are aged 26-30 (33.3%), and 1 each is 21-25, 36-40, 41-45, 46-50, 51-55, and 56-60 (11.1%).

A majority, 7, of the medical personnel finished a bachelor's degree (78%) while 2 are master's degree holders (22%).

Most, 3, of the medical personnel have an income of 15,001-30,000 baht per month (33.3%), 2 each of 30,001-45,000 or over 100,000 baht (22.2%), 1 each of 6,000-15,000 baht and 60,001-85,000 (11.1%), as shown in Figure 15.

[6] Since the number of participants is small, the results could deviate from reality.

Figure 15: Income of medical personnel in Chiang Rai (percent)



Source: Sal Forest

2.2 Case study concerning potentially misleading news in Samut Sakhon

The survey of opinions on the influence of Covid-19 news on daily behaviours of people in Samut Sakhon was conducted from May 13, 2021 to June 23, 2021. The survey involved a total of 58 stakeholders who came across the news that more than 900 new infections had been found in a tuna canning factory. Among them, 25 are people from other provinces who wished to travel to Samut Sakhon during the period when the news was publicised, 26 are Samut Sakhon residents[7], 11 are business operators, 7 are medical personnel outside Samut Sakhon, and 4 are medical personnel in Samut Sakhon. Details are as follows:

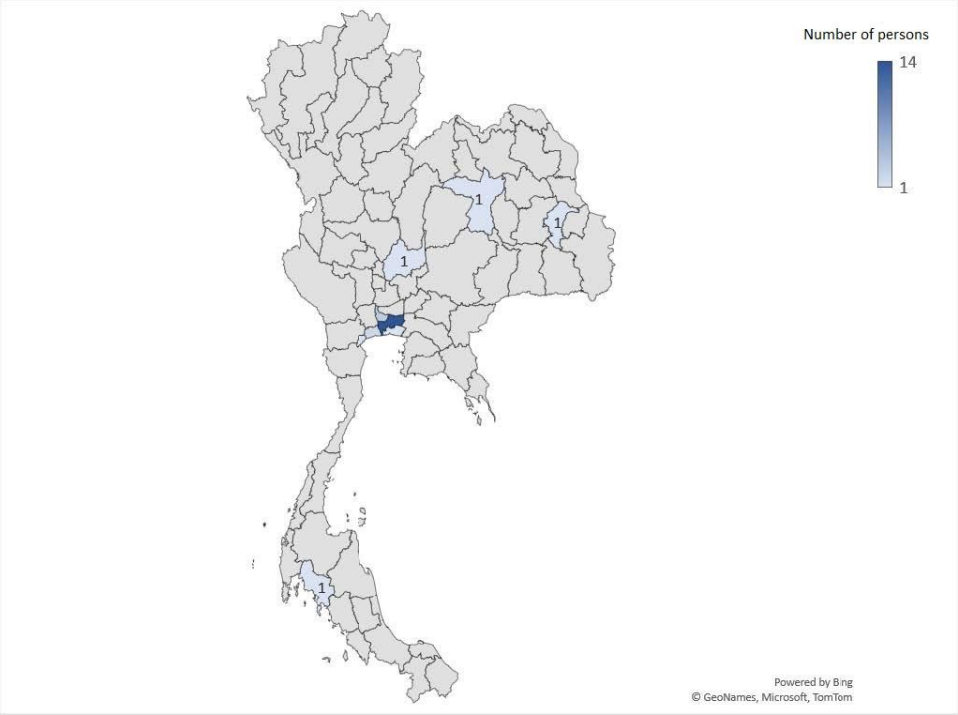
2.2.1 Non-residents of Samut Sakhon

Among 25 non-residents of Samut Sakhon, 14 reside in Bangkok (56), 3 in Nonthaburi (12%), 2 in Samut Sakhon[8] (8%), 1 in Samut Prakan, Khon Kaen, Krabi, Yasothon, Lop Buri and Samut Songkhram, each (4%), as shown in Figure 16.

[7] From the 26 residents, 15 belong to the group of business operators and medical workers in Samut Sakhon as well.

[8] Since the respondents were asked both which province they currently reside in and their current location, the answers could be incongruous. For example, some respondents might pick the wrong province or were staying out of Samut Sakhon at the time the news proliferated. In this case, the research team adhered to the respondents' answers in defining which sample groups they belong to.

Figure 16: Provinces where non-residents of Samut Sakhon live (persons)

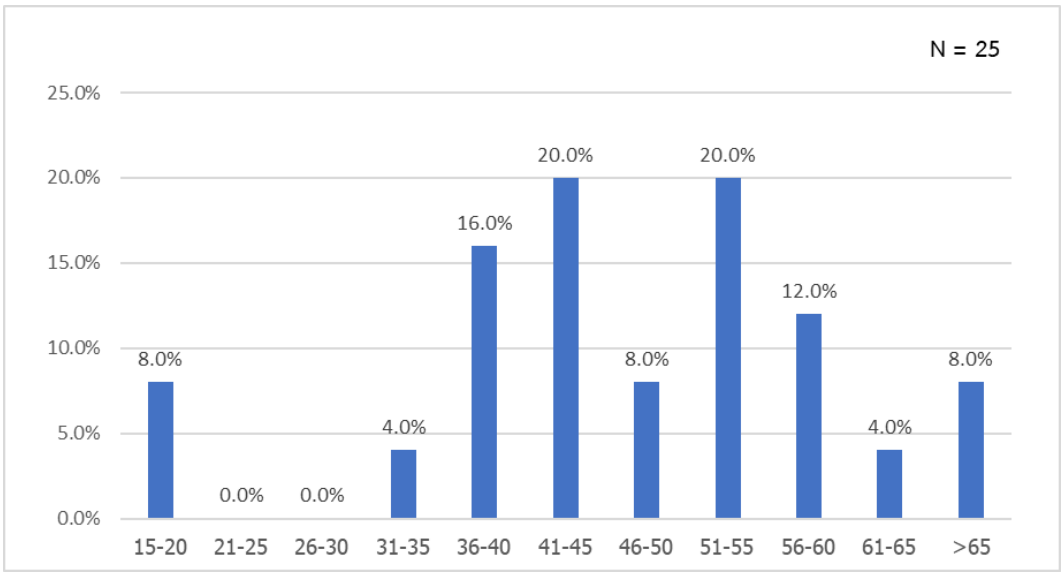


Source: Sal Forest

The respondents are aged 15-81, with an average age of 48. Five respondents are in each of the age groups of 41-45 and 51-55 (20%), 4 are 36-40 (16%), 3 are 56-60 (12%), 2 each are 15-20, 46-50 and over 65 (8%) while 1 each is 31-35 and 61-65 (4%). All as shown in Figure 17.

More than half of the respondents, 15, are male (60%), 8 are female (32%) while 1 did not specify gender (4%).

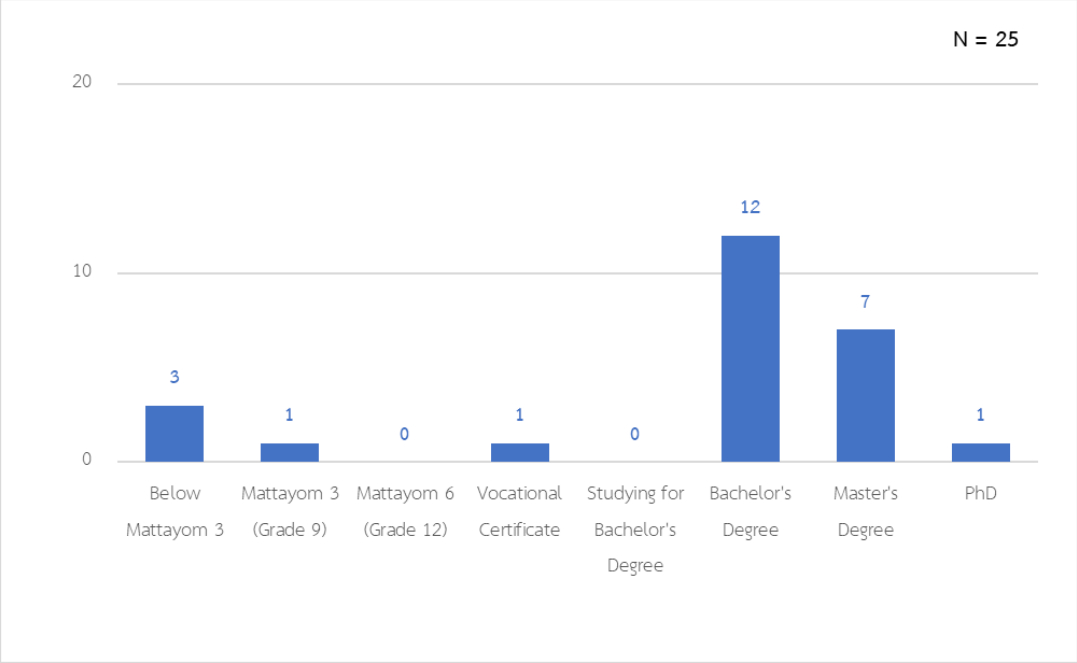
Figure 17: Age of non-residents of Samut Sakhon (persons)



Source: Sal Forest

Almost half of the respondents, 12, are bachelor's degree holders (48%), 7 are master's degree holders (28%), 1 each has Matthayom 3 education, vocational college degree, or PhD (4%), as shown in Figure 18.

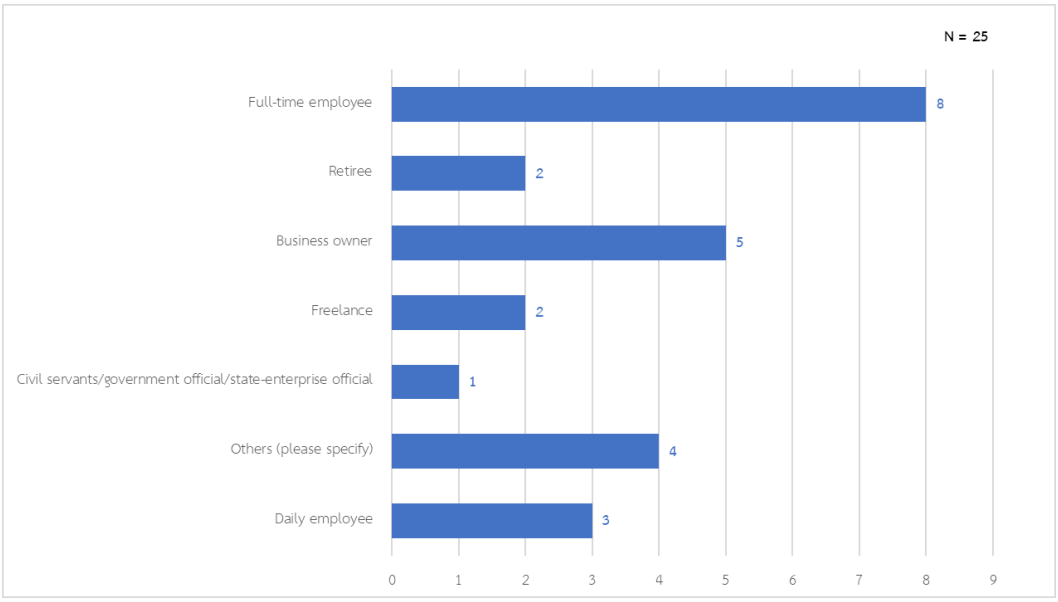
Figure 18: Education level of non-residents of Samut Sakhon (persons)



Source: Sal Forest

About one-third of the respondents, 8, are company employees (32%), 5 are business owners (20%), 3 are daily wage earners (12%), 8 are public officials, state employees or state enterprise employees (11.9%), 2 are retirees, independent workers or freelancers (8%). None of the respondents are medical personnel or students. All as shown in Figure 19.

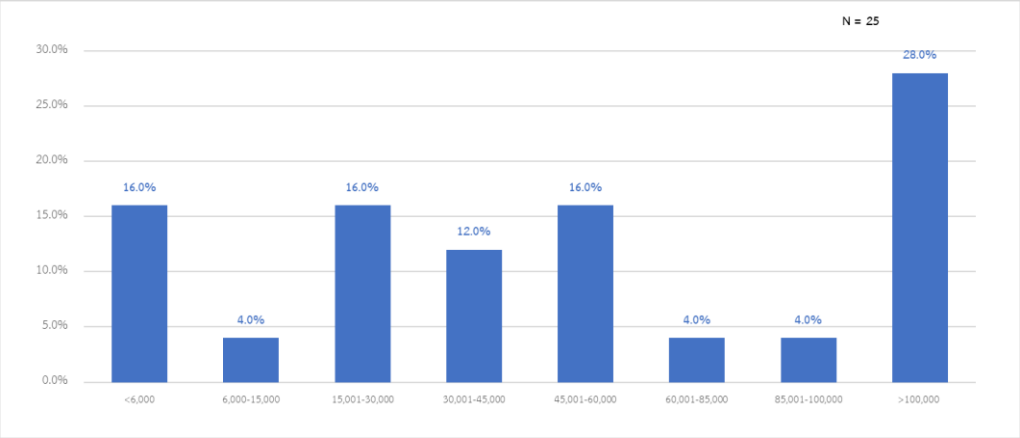
Figure 19: Occupation of non-residents of Samut Sakhon (persons)



Source: Sal Forest

A total of 7 respondents who are non-residents of Samut Sakhon have income over 100,000 baht per month (28%), 4 each have less than 6,000 baht, 45,001-60,000 baht or 15,001-30,000 baht (16%), 3 have 30,001-45,000 baht (12%) while 1 each has 6,000-15,000, 60-000-85,000 baht and 85,001-100,000 baht (4%), as shown in Figure 20.

Figure 20: Income of non-residents of Samut Sakhon (percent)

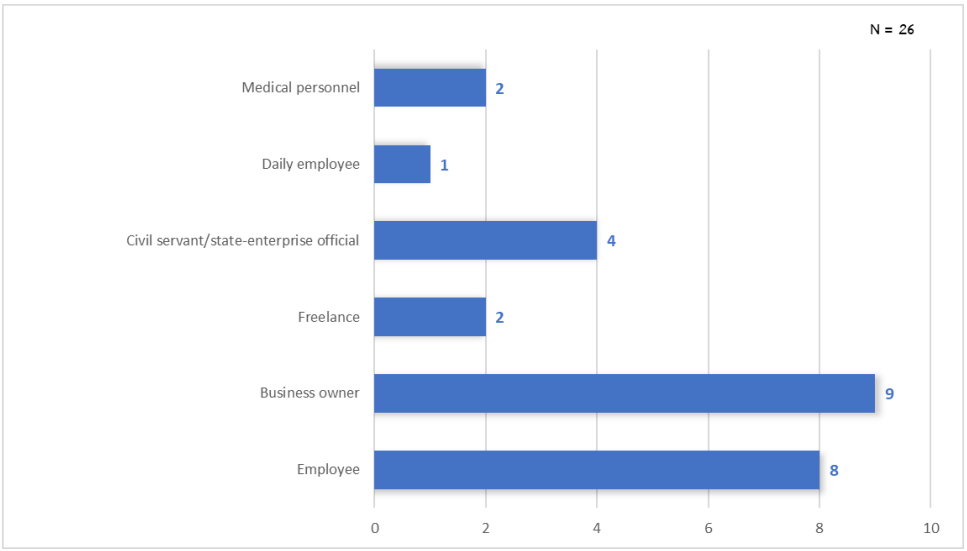


Source: Sal Forest

2.2.2 Residents of Samut Sakhon

A total of 26 respondents[9] are residents of Samut Sakhon, aged 16-63, with an average age of 42. They are split half and half between male and female (50%). Roughly one-third of the respondents who are residents of Samut Sakhon, 9, are business owners (35%), 4 are public officials, state employees or state enterprise employees (15%), 8 are private company employees (31%), 2 each are medical personnel and independent workers or freelancers (8%) while 1 is a daily wage earner. There were no students or retirees among the respondents. All as shown in Figure 21.

Figure 21: Occupation of residents of Samut Sakhon (persons)

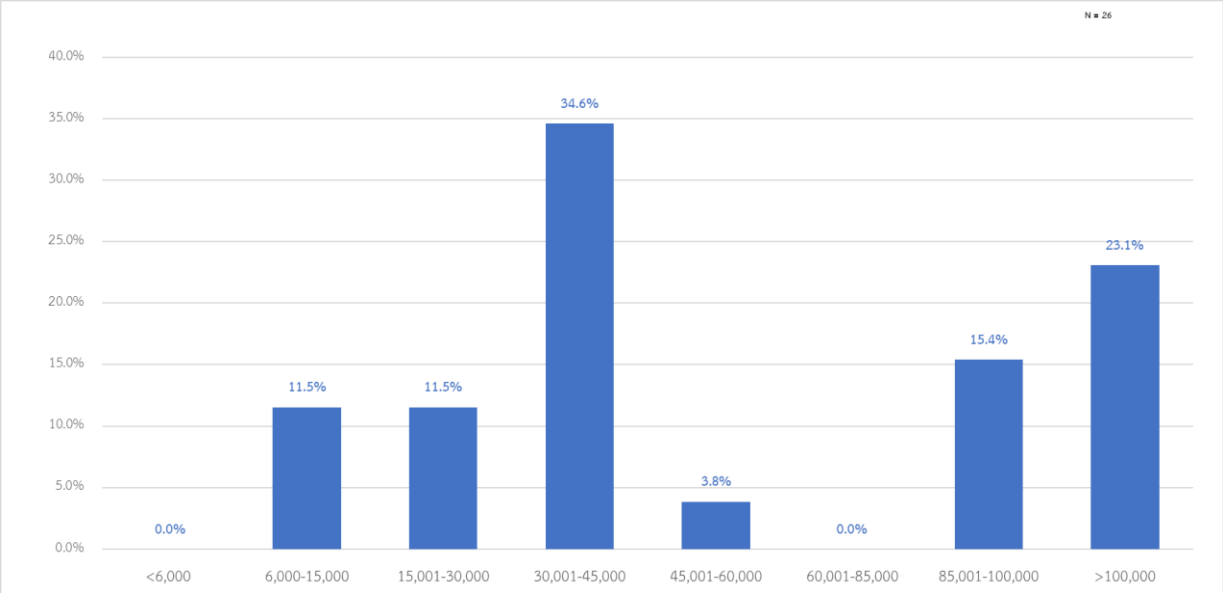


Source: Sal Forest

[9] From the 26 respondents, 15 are also business operators and medical personnel based in Samut Sakhon.

In terms of income, 9 respondents who are Samut Sakhon residents have an income of 30,001-45,000 baht per month (34%), 6 have over 100,000 baht per month (23.1%), 4 have 85,001-100,000 baht per month (15.4%), 3 each are in the 6,000-15,000 and 15,001-30,000 brackets (11.5%) while 1 has 45,001-60,000 baht per month (3.8%), as shown in Figure 22.

Figure 22: Income of residents of Samut Sakhon (percent)

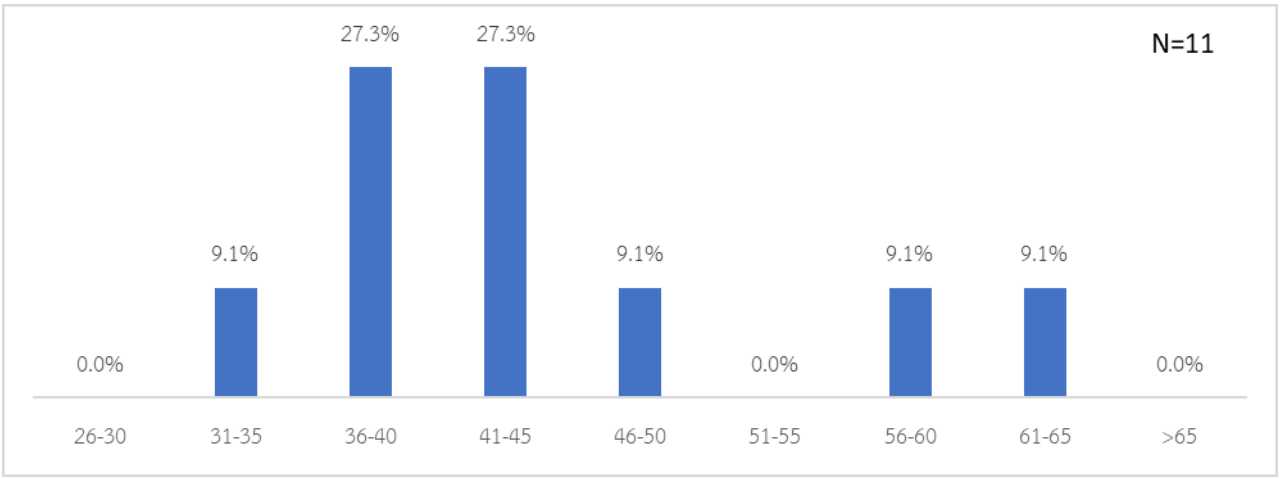


Source: Sal Forest

2.2.3 Business operators in Samut Sakhon

A total of 11 respondents[10] are business operators aged 16-61. Slightly more than half, 6, are 36-45 years old (54.5%), 9.1% each are 31-35, 46-50, 56-60 and 61-65. A majority, 8, are male (72.7%) while 3 are female (27.3%). All as shown in Figure 23.

Figure 23: Age of business operators in Samut Sakhon (percent)

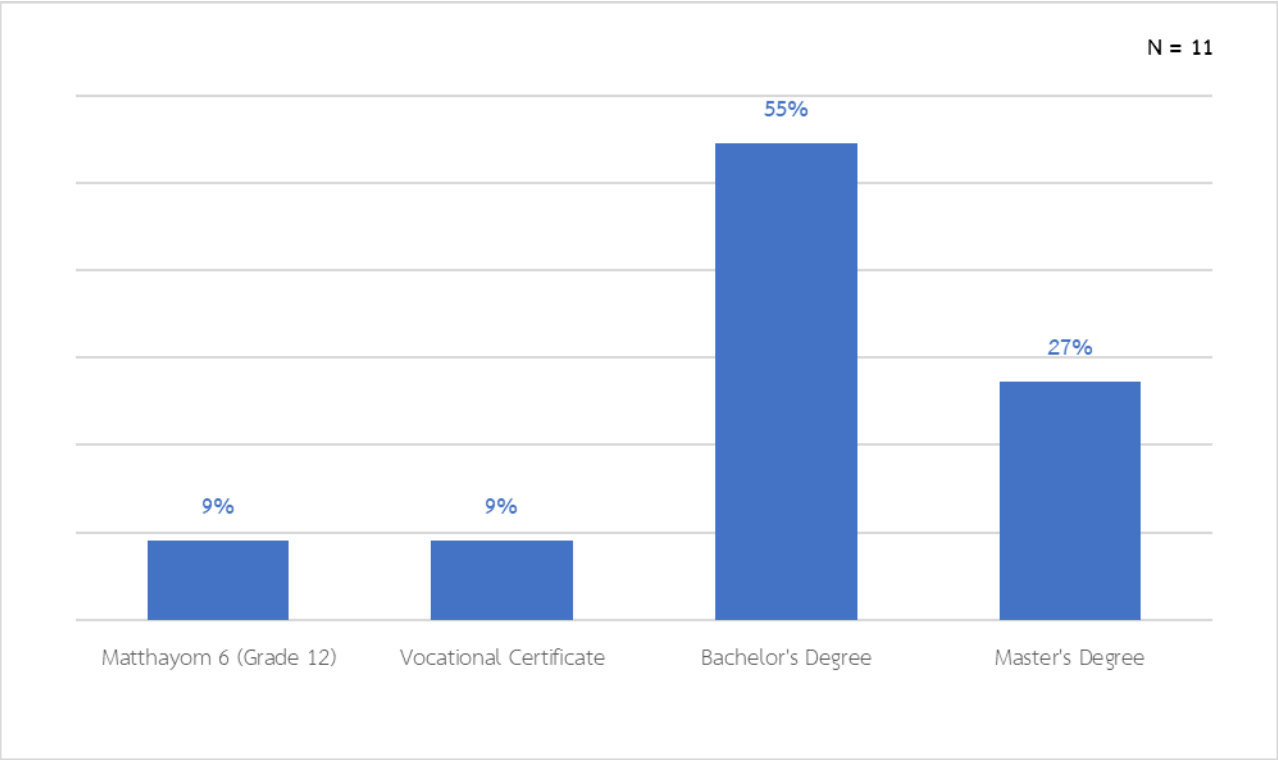


Source: Sal Forest

[10] Since the number of participants is small, the results could deviate from reality.

Slightly more than half of the respondents, 6, have a bachelor's degree (55%), 3 have master's degrees (27%), 1 has a Matthayom 6 level education, and 1 went to a vocational college (9% each), as shown in Figure 24.

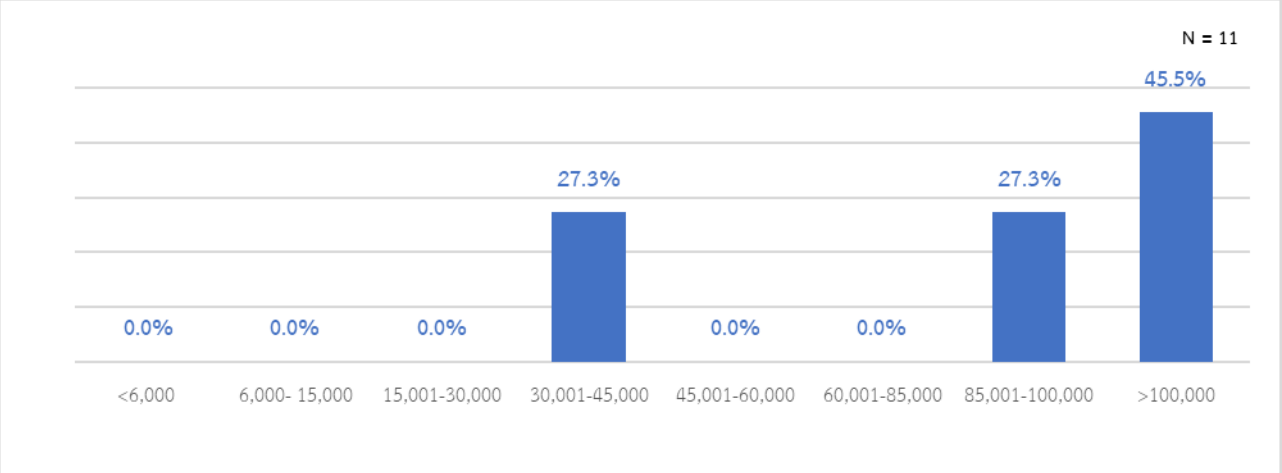
Figure 24: Level of education of business operators in Samut Sakhon (percent)



Source: Sal Forest

Almost half of the respondents who are business operators in Samut Sakhon, 5, have income over 100,000 baht (45.5%), and 3 each have 85,001-100,000 baht and 30,001-45,000 (27.3%), as shown in Figure 25.

Figure 25: Income of business operators in Samut Sakhon (percent)



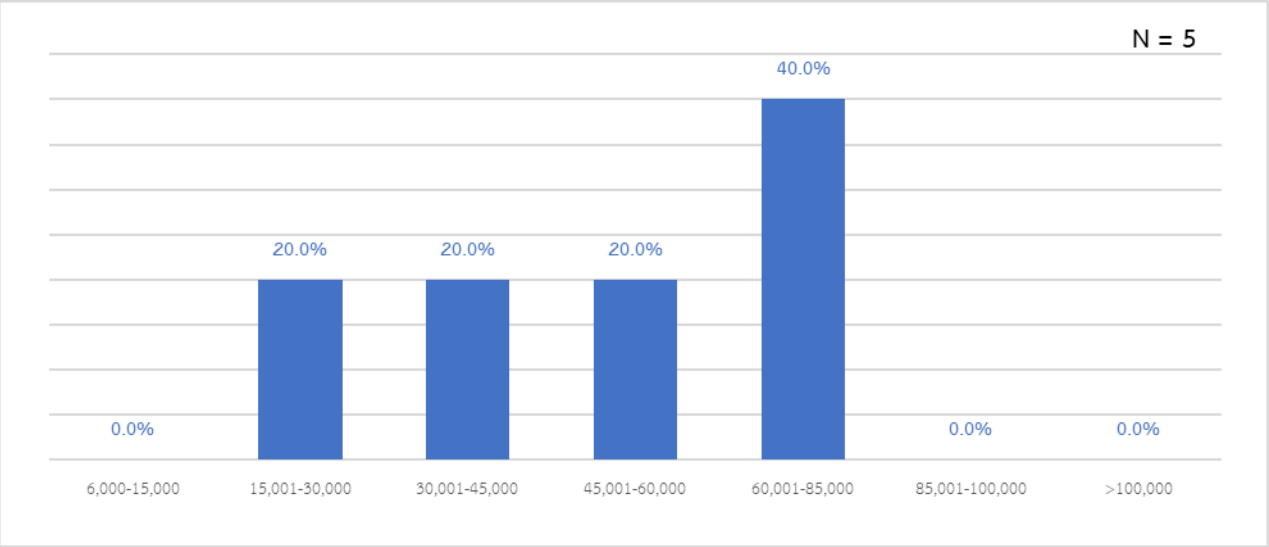
Source: Sal Forest

2.2.4 Medical personnel outside Samut Sakhon

Out of 5 respondents[11] who are medical personnel outside Samut Sakhon, 4 are based in Bangkok (57%) and 1 in Prachinburi (20%). All are female, aged 28-60. 4 are 51-60 (80%) while 1 is 28 years old (20%).

Among the five respondents, 3 are bachelor's degree holders (60%) and 2 are master's degree holders (40%). Two have a monthly income of 60,001-85,000 baht (40%), and the others each have an income of 15,001-30,000, 30,001-45,000 or 45,001-60,000, as shown in Figure 26.

Figure 26: Income of medical personnel outside Samut Sakhon (percent)



Source: Sal Forest

2.2.5 Medical personnel based in Samut Sakhon

4 medical personnel[12] in Samut Sakhon took part in the survey. 3 are male (75%) and 1 is female (25%). The participants are aged 29-63 with an average age of 44. Half of them, 2, have bachelor's degrees, 1 has a master's degree and 1 has a doctoral degree each (25%).

Two-thirds of the medical personnel in Samut Sakhon, 3 respondents, have an income of 30,001-45,000 baht per month (75%). The remaining respondent has an income between 45,001-60,000 baht per month (25%).

[11] Since the number of participants is small, the results could deviate from reality.
[12] Since the number of participants is small, the results could deviate from reality.

Chapter 3: Social impacts from the perception of Covid-19 misinformation

3.1 The Chiang Rai case study

The research team chose misinformation on “Chiang Rai going into a lockdown before New Year” as their case study. They chose it because the piece was widely circulated and its impacts were broadly felt among the public.

The misinformation began to circulate in early December 2020, after news emerged that a few people infected with Covid-19 had sneaked into the country illegally via the Thai-Myanmar border in Mae Sai district, Chiang Rai, since late November 2020. Misinformation about a Chiang Rai lockdown proliferated among social media users for about a week before corrections coming from traditional media, online influencers and relevant authorities essentially put an end to it (Wisesight analysis).

3.1.1 Logic model on social impacts of the misinformation

It is assumed that once people received the misinformation, they could forward it to others by retelling the story or sharing the misinformation on social media. A possible effect of the spreading of the misinformation is that people who received it would start feeling panic and become fearful that the outbreak could be more serious than it actually was. The response could provoke behavioural changes in 6 categories (Details in Figure 27). Other findings:

1. An increase in the number of people seeking Covid-19 tests after receiving the misinformation (including going outside Chiang Rai to get tested). The increase in Covid-19 test seekers could put more stress on the public health system which could result in the public’s overall poorer health.

2. People who received the misinformation cut down on visits to doctors, especially affecting those suffering from chronic diseases that require continuous treatment. The change could result in delays in the patients receiving treatment which could prompt the cost of care to be hiked up while compromising the overall health of people in Chiang Rai.

3. Entrepreneurs in Chiang Rai could see an increase in exporting activity across the Mae Sai border (since the alleged lockdown could cause demand for Thai products to increase among Myanmar nationals who wouldn’t be able to cross the border and buy them). The change could see an increase in revenue from exporting activity in the short term and a boost to Chiang Rai’s overall economic performance in the long run.

4. People from other provinces refrain from traveling to Chiang Rai for business or recreational purposes. The change could cause the number of visitors to go down and consequently also their spending in the province. More businesses could shut down, prompting the Chiang Rai employment rate rise and the overall economy suffer.

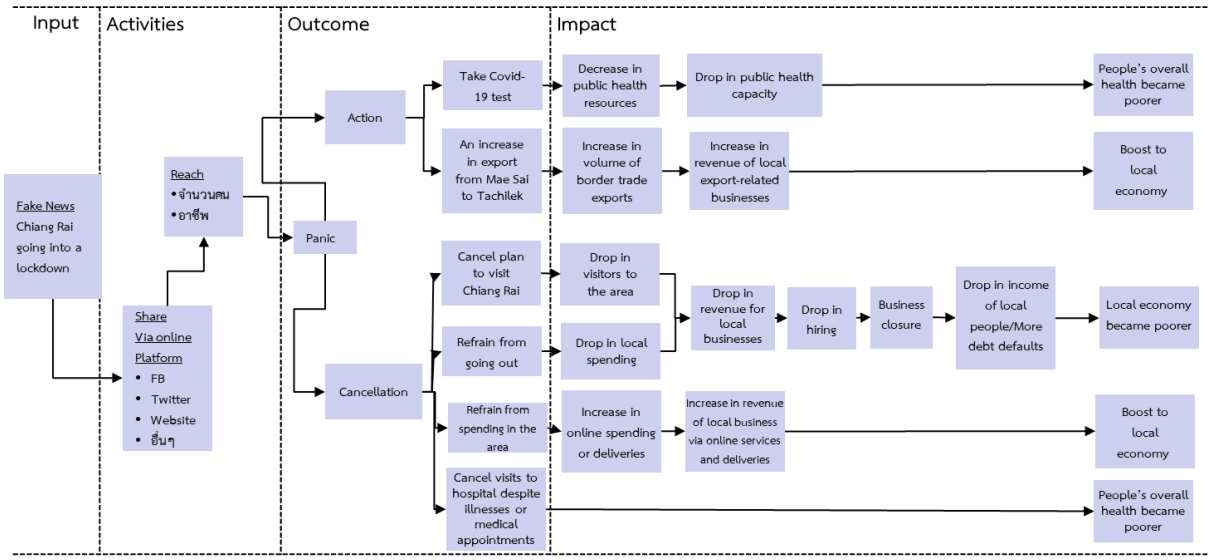
5. Less spending by Chiang Rai residents. This could cause a drop in public spending in the area and reduce income of businesses. More businesses could go under as employment falls and the overall economy of Chiang Rai would suffer as a result.

6. Less spending by Chiang Rai residents who switched to online services. The change could result in more income for businesses with online services or delivery channels which could contribute to an improvement in Chiang Rai’s overall economy.

According to the logic model, stakeholders who could change their behaviour upon receiving the misinformation can be divided into 5 groups: Chiang Rai residents, Chiang Rai business operators,

Chiang Rai medical personnel, medical personnel outside Chiang Rai, and non-residents who wish to travel to Chiang Rai during the period when the misinformation spread. The research team collected information from the stakeholders using an online survey of opinions, as explained in Chapter 2.

Figure 27: A logic model of the impact on the false claims about Chiang Rai lockdown



Source: Sal Forest

3.1.2 Social impacts from the perception of Covid-19 misinformation

This part seeks to explain findings about social impacts caused by the perception of the misinformation among the 5 groups of stakeholders, namely, Chiang Rai residents, Chiang Rai non-residents, Chiang Rai business operators, Chiang Rai medical personnel, and medical personnel outside Chiang Rai. The data is gleaned from the results of the survey which the research team designed based on the logic model.

(1) Non-residents of Chiang Rai

i Economic impacts

Based on the assumption that people outside Chiang Rai may cut down on their trips to the province which would result in less spending and a drop in the province's overall economic performance, the survey of 67 non-residents who planned to go to Chiang Rai found 52 respondents (77.6%) cancelled or postponed their trip while 15 (22.4%) went ahead with their plan.

Domestic travel statistics (Ministry of Tourism and Sports, 2021ก) indicated that there were 266,424 visitors to Chiang Rai in December 2020, an average of 66,606 per week. The visitors generated revenue of 2.053 billion baht, an average of 513.3 million baht per week. This translates into an average spending of 7,707.7 baht per visitor.

During the prior month, in November 2020, there were 285,656 domestic travellers to Chiang Rai, an average of 71,414 per week. The visits generated revenue of 2.178 billion baht, an average of 544.6 million baht per week. This translated into average spending of 7,626 baht per person, similar to that in December.

The statistics show that the number of domestic visitors to Chiang Rai dropped by an average of 4,808 people from November to December, 2020. Based on the drop in the number of visitors and missing revenue during the first week of December when the misinformation spread, the research team concluded that if 77.6% of people cancelled or postponed their trips to Chiang Rai, the province could lose 3,732 visitors from the misinformation. Since each visitor is estimated to spend 7,707.7 baht on average, the cancellations are estimated to cause damage of about 28.7 million baht during the week when the misinformation spread.

Table 1: Estimates of lost revenue from tourism during the period when the misinformation spread: Chiang Rai case study

	Survey samples (persons)	Sample proportion (percent)
Number of persons who plan to go to Chiang Rai	67	100
Number of persons who cancelled their trips due to fake news	52	77.6
Number of visitors dropped during Nov-Dec 2020 (persons per week)	4,808	
Estimate number of visitors dropped due to fake news (persons per week)	4,808 persons x 77.6% = 3,732*	
Estimate revenue loss due to fake news (baht)	3,732 persons x 7,077 baht = 27,758,186**	

Source: Sal Forest, Ministry of Tourism and Sports, *calculated based on percentages from the sample groups, **calculated based on average spending per person by the visitors in December of 7,707.7 baht.

There are three limitations to the inferences.

1. The research team had no access to the actual drop in the number of visitors per week. Thus they had to calculate based on the monthly statistics with the assumption that the drop was equal every week, which may not correspond to the actual conditions. A hotel operator who was interviewed suggested that since bookings at their hotel during the early part of the month were less than towards the end, it could mean the real drop in the number of visitors during the first week of the month was more than the estimated 4,808, which would mean greater damage from the misinformation.

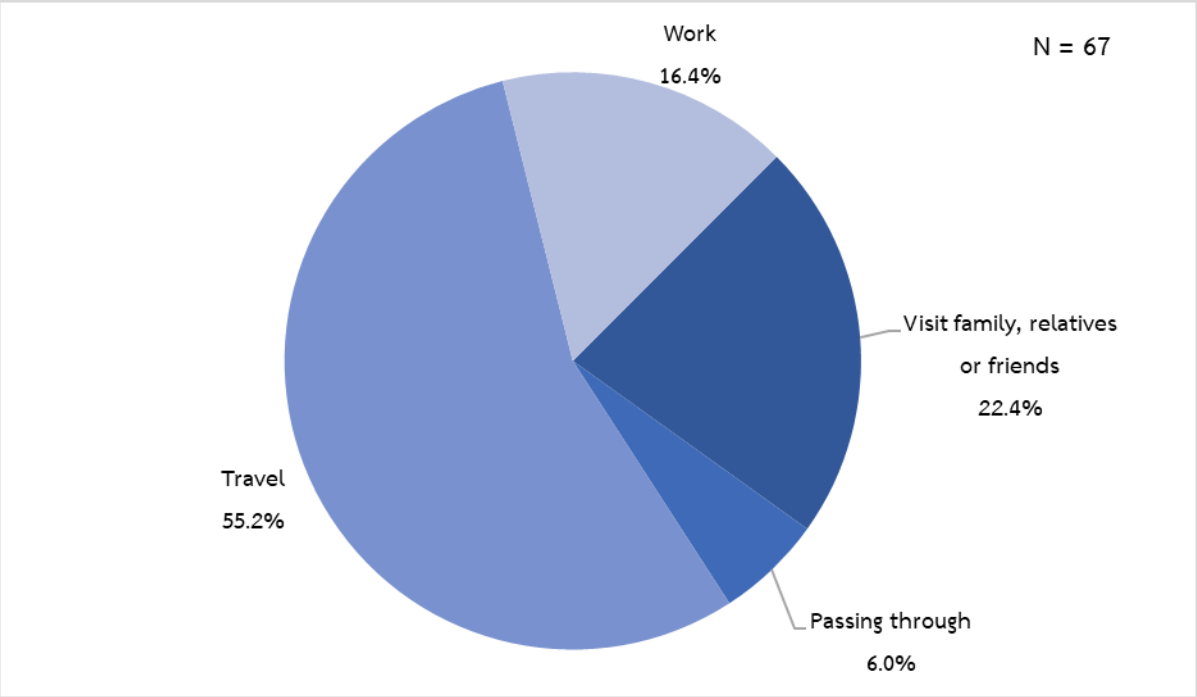
2. The cancellations could result from multiple factors which cannot be clearly distinguished. For example, the same hotel operator stated that some visitors started to panic after news emerged about illegal migrants who were Covid-19 positive who had sneaked into the country from Myanmar. The misinformation about the lockdown, which would presumably forbid people from entering or leaving Chiang Rai for 7 to 14 days, could serve as a secondary factor pushing tourists to cancel their hotel reservations. Since tourists generally could not weigh which factors contributed to their cancellations or indicate which of them primarily led to their final decision, the research team could not categorically distinguish between damage caused by the misinformation and other factors. Besides, it was very possible that the damage was caused by factors other than the misinformation.

3. The inference about the number of people who cancelled their trips to Chiang Rai could deviate from reality. This is because the number of cancellations was not based on genuine statistics but calculated from random samples. Since the sample size is small (67) the number and ratio of the cancellations could deviate from what really happened which could result in an increase or decrease in the amount of damage.

ii Social impacts

The social impacts analysis relied on qualitative indicators derived from the purpose of travel. The survey found slightly more than half of the people surveyed, 37 (55.2%), planned to visit Chiang Rai for tourism or recreational purposes, 15 (22.4%) to visit their family, relatives or friends, 4 (6%) were just passing through the province while 11 (16.4%) were there to work, as shown in Figure 28.

Figure 28: Purposes of visits to Chiang Rai by non-residents (percent)

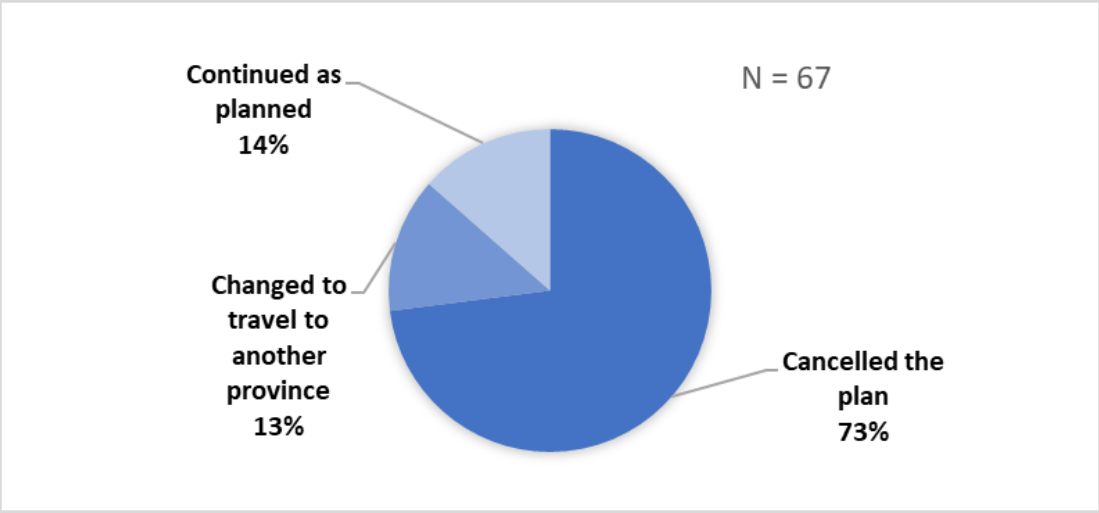


Source: Sal Forest

Tourists

In response to the misinformation, a majority (73%) of respondents decided to cancel or delay their visits, 13.5% went to other provinces while 13.5% went ahead to Chiang Rai as planned (Figure 29).

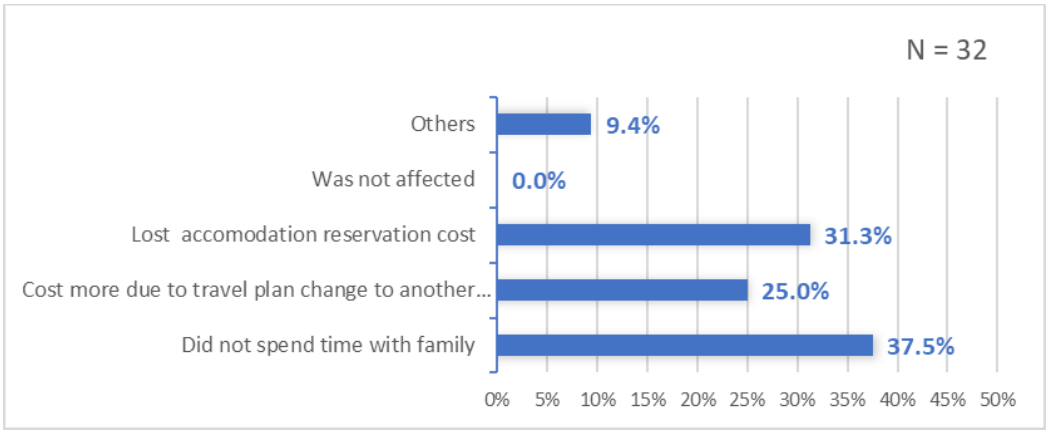
Figure 29: Responses of non-residents who planned to visit Chiang Rai (percent)



Source: Sal Forest

Other social effects found in the sample group include lost opportunity to spend time with family (37.5%), loss of bookings or advance payments to hotels (31.3%), additional expenses in case of switching to other destinations (25%), and other impacts such as the need to re-plan the trips (9.4%), as shown in Figure 30.

Figure 30: Impacts on non-residents who planned to visit Chiang Rai (percent)



Source: Sal Forest

In summary, after learning about the misinformation, most people who planned to visit Chiang Rai cancelled or postponed their trips. This group has the highest number and makes up the highest ratio of all stakeholder groups. As a result, the behaviour changes by this group had considerable impacts on Chiang Rai's economy.

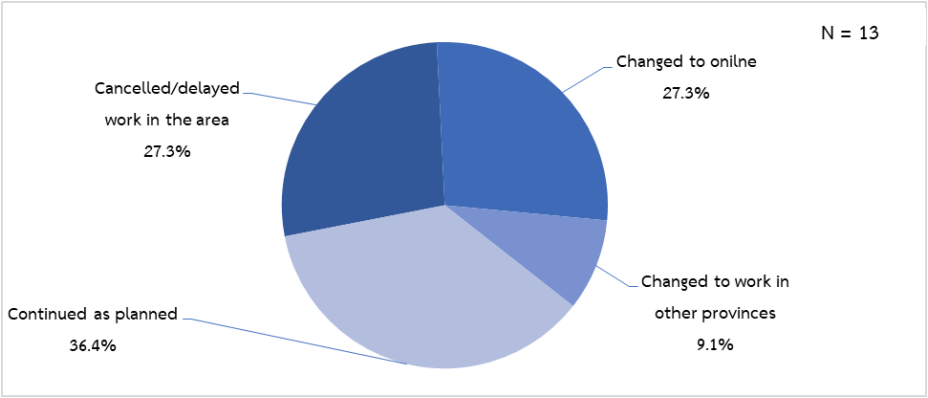
The finding corresponds to the result of an economic impact analysis primarily targeting revenue from the tourism sector.

In terms of social impact, the travellers were affected by failure to spend time with their family during the planned vacations while wasting the money already paid for hotel reservations and transportation.

Workers

A total of 11 respondents[13] who are non-residents of Chiang Rai planned to go to work in the province. Upon receiving the misinformation, 27.3% cancelled or postponed their plans. An equal percentage (27.3%) switched to working online. 9.1% went to work in other provinces. 36.4% went ahead with their plan to go to work in Chiang Rai (Figure 31).

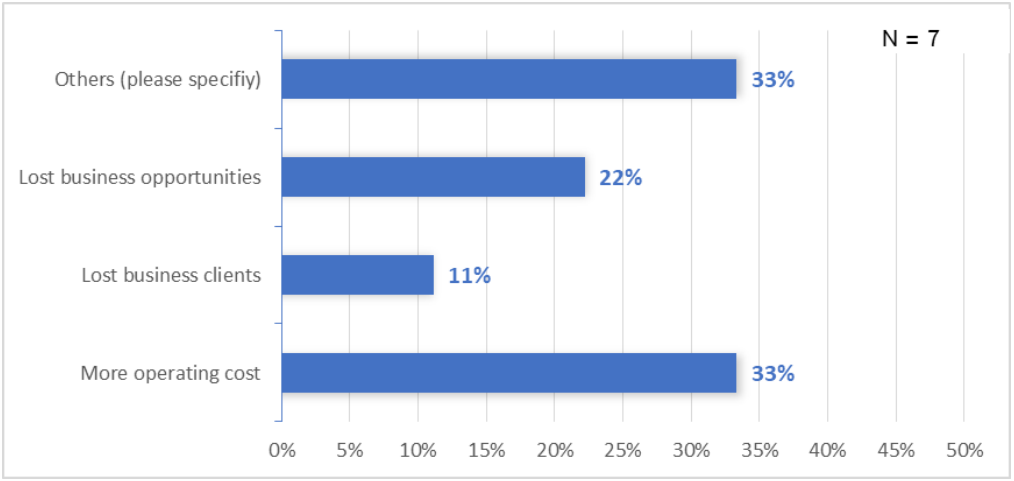
Figure 31: Responses of non-residents of Chiang Rai who planned to go to work in the province (percent)



Source: Sal Forest

From the 7 respondents who cancelled or postponed their trips into the area, or switched to working online, or went to other provinces instead, 33% said they were affected by an increase in operating costs, 22% said they suffered from opportunity loss while 11% said they lost customers as a result, as shown in Figure 32.

Figure 32: Impacts on non-residents of Chiang Rai who planned to work in the province (percent)



Source: Sal Forest

Since most of the respondents went ahead with their plan to go to work in Chiang Rai, the impact on Chiang Rai's economy from this group was less than from the others. Although the decision to switch to working online could result in an increase in operating costs, opportunity losses and losses

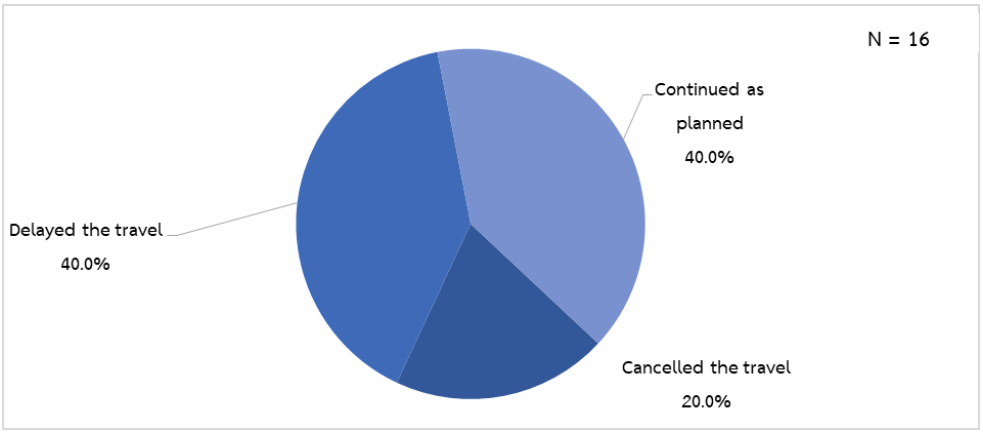
[13] Since the number of participants is small, the results could deviate from reality.

of customers, the respondents did not specify details of the operating costs or quantify the increase.

People who planned to visit relatives/family members/friends

A total of 15 people took part in the survey who are non-residents of Chiang Rai who planned to go to the province to visit relatives, family members or friends at the time the misinformation spread. Among the participants, 60% cancelled or postponed their trips while 40% went ahead with their plans, as shown in Figure 33.

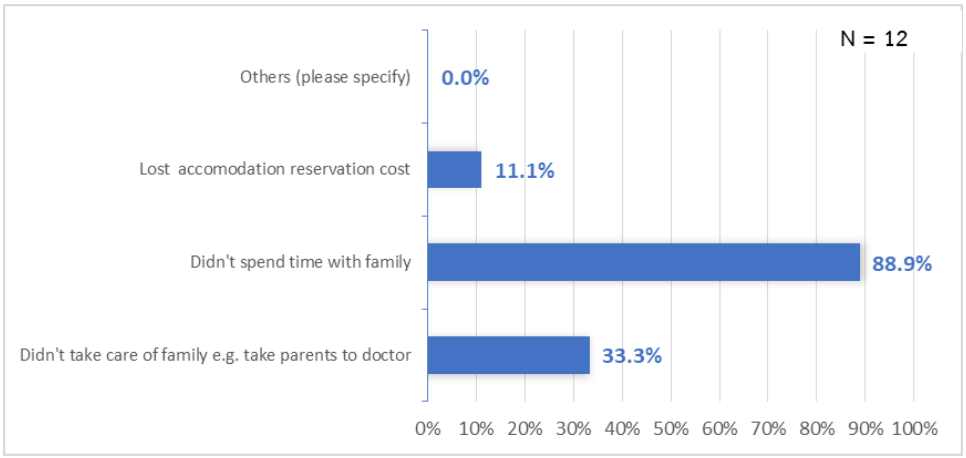
Figure 33: Responses of non-residents of Chiang Rai who planned to visit relatives, family members or friends (percent)



Source: Sal Forest

Among those who decided to cancel or postpone the trips, 88.9% said they were affected by failure to spend time with family, 33.3% said they could not take care of their relatives such as to take them to see a doctor, while 11.1% said they lost the money paid upfront to book their accommodations or transport, as shown in Figure 34.

Figure 34: Impacts on non-residents of Chiang Rai who planned to visit relatives, family members or friends in the province (percent)



Source: Sal Forest

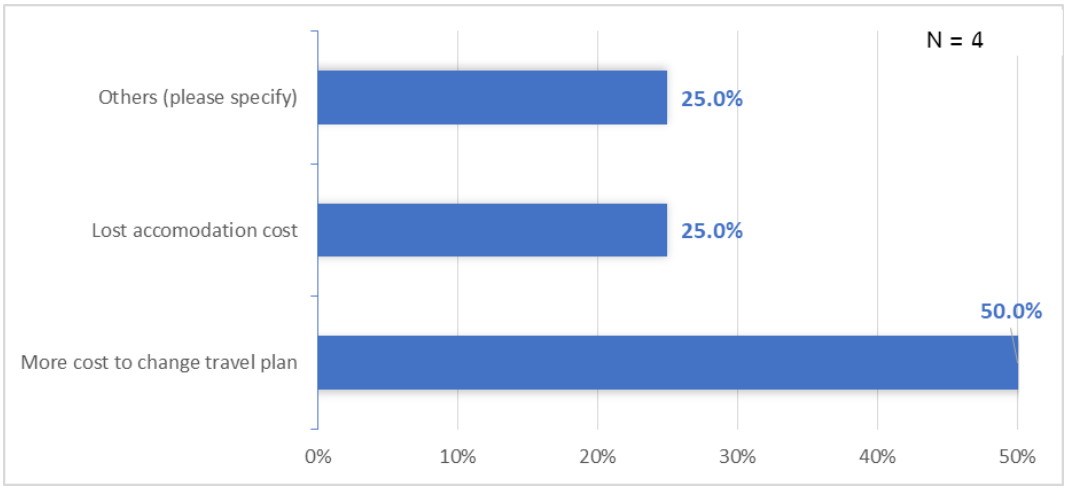
Although a majority of people in this group decided to cancel or delay their trips, it accounts for a smaller ratio in comparison to others, so that its impact on the overall economy of Chiang Rai could

be less. As for the social impact, people in this group mostly felt that they lost an opportunity to go on vacation or take care of their family, relatives or friends.

Travellers passing through Chiang Rai

A total of 4 of the respondents planned to pass through Chiang Rai during the period when the misinformation spread. All of them cancelled their trip upon receiving the misinformation. Half of them (50%) said they had to spend more for their travel, 25% said they wasted their advance payments for accommodation and transport while the remaining 25% said they could not go on their trips at all, as shown in Figure 35.

Figure 35: Impacts on non-residents of Chiang Rai who planned to pass through the province (percent)

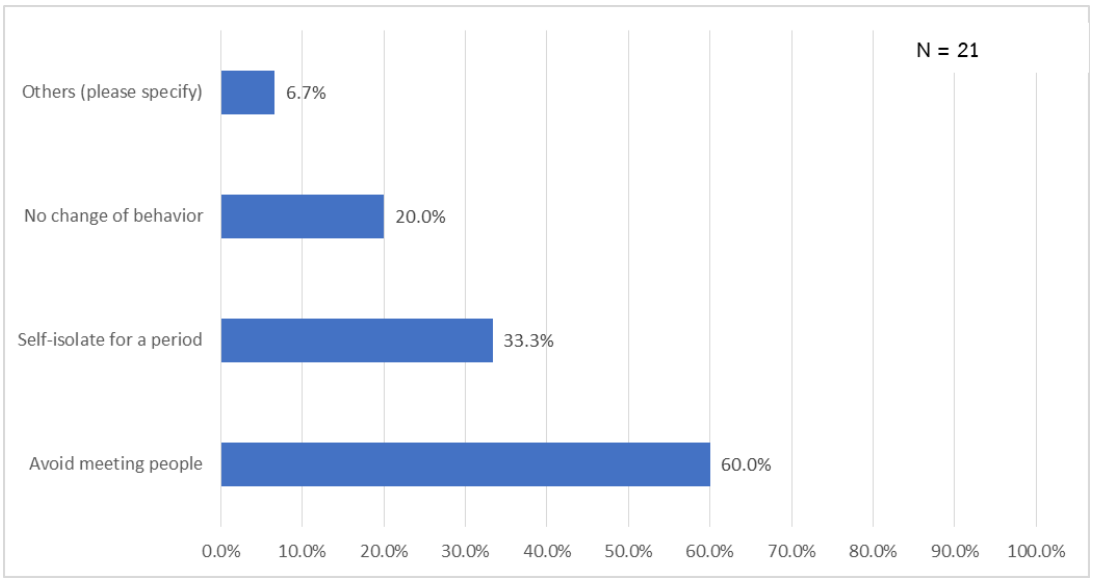


Source: Sal Forest

Visitors who maintained travel plans to Chiang Rai

A total of 15 respondents kept to their travel plans. In terms of behaviours, where respondents could choose more than one option, 66.7% said they avoided meeting people after returning from the province, 33.3% said they isolated themselves for a period of time while the remaining 20% said they did not change their behaviour. None of the respondents said they went to have Covid-19 tests, as shown in Figure 36.

Figure 36: Behavioural change after travelling to Chiang Rai (percent)



Source: Sal Forest

(2) Chiang Rai residents

i Economic impacts

Based on 73 respondents[14] who are residents of Chiang Rai, the survey found that the misinformation caused a moderate, 34-67%, drop in people's spending[15] from their normal level.

Data on domestic households in 2020 (National Bureau of Statistics, 2021ก) shows that a household in Chiang Rai spends an average of 11,532 baht per month and that there are altogether 374,934 households in the province. Based on the data, the research team inferred that the drop of 34-67% in spending by people in Chiang Rai would amount to 3,920.9-7,726.5 baht per household per month or 980.2-1,931.6 baht per week. The damage during the week when the misinformation proliferated is thus estimated to be between 367.5 and 724.2 million baht, as shown in Table 2.

Table 2: Estimates of the drop in spending by people in Chiang Rai during the spread of misinformation: Chiang Rai case study

Monthly household spending in Chiang Rai (baht)	Number of households in Chiang Rai	Proportion of average spending drop of the sample group (percent)	Spending drop per month per household (baht)	Spending drop per week per household (baht)	Total spending drop (million baht)
11,532	374,934	34	3,920.90	980.2	367.5*
		67	7,726.5	1,931.6	724.2*

Sources: Sal Forest, National Bureau of Statistics, * The estimates are calculated from an average drop in spending per week by all households in Chiang Rai.

[14] 43 out of 73 respondents were counted as business operators and medical personnel in Chiang Rai as well.
[15] The research team defined a slight drop/increase in spending as a drop from 0-33% of normal spending, moderate drop/increase as that from 34-67% and significant drop/increase as more than 67%.

The drop in spending by people in Chiang Rai varied according to different products. Details are as follows:

Products on which spending slightly increased or stayed unchanged[16]

1. Medicine/medical supplies
2. Consumer goods such as cleaning agents, soap, shampoo and cooking gas

Products on which spending slightly dropped

1. Fresh food/cooked food and drinks

Products on which spending dropped moderately

1. Semi-durable goods such as clothes, home appliances, etc.
2. Durable goods such as electrical appliances, furniture, cars, etc.

Products on which spending dropped significantly

1. Luxury goods such as cosmetics, brand name goods, etc.
2. Alcohol, beer and cigarettes
3. Services such as restaurants and travel

As for the manner of spending, the survey found that most Chiang Rai residents significantly increased their spending online and on deliveries (an average score of 6.21 out of 7[17]).

In summary, based on the changes in spending by Chiang Rai residents, most of the impacts fell on businesses that could not offer online services or deliveries, operators of night-time businesses and shopping malls. The findings are in line with changes in travelling behaviours by Chiang Rai residents addressed in the next part.

ii Social impacts

The research team analysed the social impacts of changes in people's daily activities caused by the misinformation. These activities cover three areas: modes of transportation within the province, visits to public places, and what did people do to protect their health.

Modes of transportation in the province

Almost all respondents (93.3%) normally travel by personal car or motorcycle, 4.1% ride along with relatives or friends while 1.3% use other means such as flying.

The misinformation did not affect people's daily commuting that much as most of them continued to get around by personal car or motorcycle or on foot. However, the residents tended to avoid certain means of transport (including cases where they did not use these means in their daily lives). Among

[16] The research team defined a slight drop/increase as a change between 0-33% of normal spending, moderate as a change between 34-67% and significant change as a change of more than 67%.

[17] The score is from 1 to 7 with 4 indicating no change to the manner of spending, 1 more spending by cash and 7 more spending by online payment or on deliveries.

them, public buses were a mode of transportation that respondent residents refrained from using or avoided the most, followed by vehicles of acquaintances, relatives and friends, respectively.

However, the changes in behaviours conformed to the way people in Chiang Rai already travelled around, namely, by car or motorcycle. The misinformation about the province's lockdown therefore had no impact among the residents on how they travelled inside the province.

Visits to public places

The survey found that, overall, upon receiving the misinformation, people refrained from travelling anywhere and did not visit any area unless necessary. The reasons given were fear about personal safety and trepidation that the outbreak would expand.

The choices varied, however. Facilities that people in Chiang Rai refrained from doing the most involved entertainment venues such as pubs, bars, massage parlours, followed by shopping malls and recreational facilities such as cinemas, public parks, stadiums, gyms and game centres.

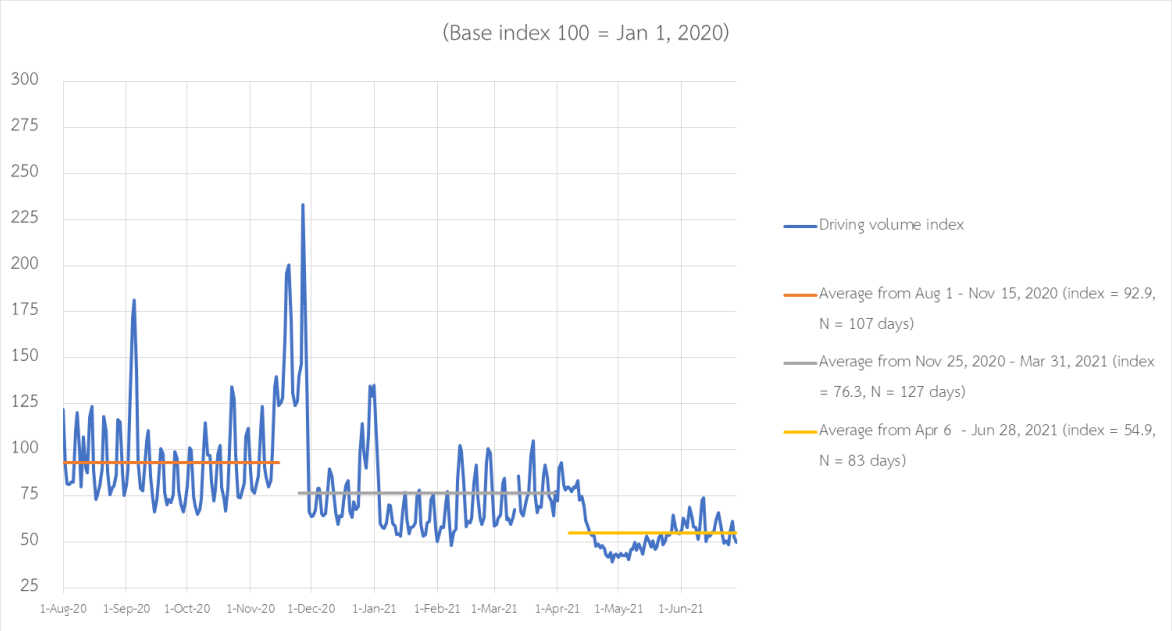
Places people avoided somewhat included restaurants outdoor shopping malls, street food stalls, markets, fresh markets, shops and medical facilities. The place people avoided the least was their workplace.

As such, impacts from the change in visitation behaviour are not equally spread among different business operators. Night-time business operators and large-scale entrepreneurs bear the brunt primarily, followed by medium-and small-scale operators. Business operators located in office areas received the least impact regardless of their size, because most people still have to travel to and from work.

Apple's Mobility Trend Report which shows daily human mobility at the provincial level only recorded information about driving, with no data on walking or public transit. According to the report, the mobility index went down from an average of 92.9 during August to November 2020, to 76.3 during late November to March 31, 2021, a drop of 17.9%. The misinformation spread during late November to early December 2021. After the above period, the mobility index gradually rose, before dropping again when the third wave of virus outbreak struck.

Compared between the misinformation period and the third wave from April 2021 onwards, the mobility index shows a steeper plunge during the third wave, falling from 76.3 to 54.9, or an average of 28%, as shown in Figure 37.

Figure 37: Driving index of people in Chiang Rai from Apple's Mobility Trends



Source: Sal Forest

Behavioural change regarding health prevention

Respondents were allowed to choose more than one option regarding what they did to protect themselves from Covid-19. The survey found that people in Chiang Rai mainly chose wearing a surgical mask and cleaning their hands with alcohol sanitiser (95.5% and 87.7% respectively). Only 52.1% and 63% of respondents chose wearing cloth masks and washing their hands with soap.

Following the spread of the misinformation, people in Chiang Rai did more of everything to protect themselves, but to varying degrees. The respondents indicated that they did more in terms of cleaning their hands with alcohol sanitiser and wearing a surgical mask. Although people said they did more in terms of washing their hands with soap and wearing a cloth mask as well, the increase was less compared to other activities. The findings indicated that people became more fearful and did more to protect themselves against the virus.

The change in healthcare behaviour resulted in higher spending on Covid-19 prevention as people upgraded from the use of cheaper soap and cloth masks to more expensive and disposable surgical masks and alcohol sanitiser. However, since most people in Chiang Rai already adopted the use of surgical masks and alcohol sanitiser to curb Covid-19 spread even before the misinformation, the change was not expected to provoke any significant impact.

As for possible impacts on people who might avoid meeting their doctor for appointments during the spread of the misinformation, the survey found that 45.2% of respondents did not have appointments during the period. Of those who did have appointments, 60% avoided attending the appointment while the remaining 40% went ahead as scheduled. Most of the respondents (76.7%) did not have underlying diseases which required regular check-ups. As for the assumption that people would rush to have themselves tested for Covid-19 after learning about the misinformation, the survey found that most of the respondents (87.7%) did not do so. For these reasons, the impact of the misinformation on Chiang Rai's overall public health system is considered insignificant.

(3) Chiang Rai business operators

Business operators in Chiang Rai province could be affected by changes in spending behaviours of both visitors to the province and residents. The research team set the following assumptions as the basis for using the logic model:

1. People from other provinces decided to cancel their plans to travel to Chiang Rai, whether for recreation or business. The cancellations would result in a reduction in the number of tourists and tourist spending and thereby income of businesses in the province, resulting in more business closures and a further drop in employment, adding to the pressure on Chiang Rai's economy as a whole.

2. Chiang Rai residents would opt to spend less time outside their homes, resulting in less spending and therefore less revenue for businesses, more closures, less employment and a weaker economy overall.

3. In opting to spend less time outside their homes, Chiang Rai residents could switch to online shopping channels, raising the incomes of businesses with online services and delivery services, in turn boosting the province's economy.

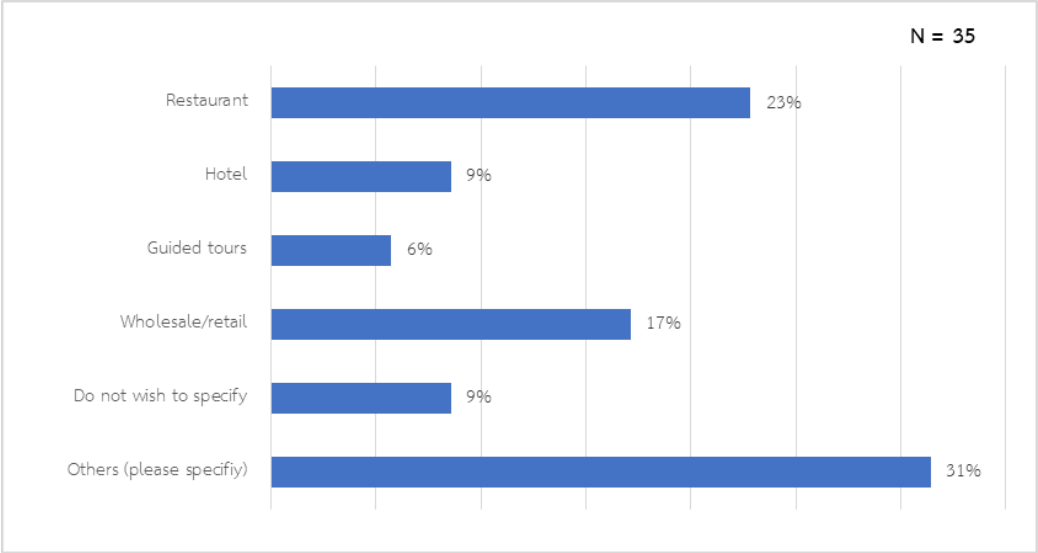
An analysis of the economic impacts of changes in the behaviours of both residents and non-residents of Chiang Rai based on the survey results are as follows:

i Impacts on business revenues as a whole

A total of 35 business operators participated in the survey. Among them, 8 or 23% are in the restaurant business, 6 or 17% in wholesale and retail, 3 or 9% in hotels, 2 or 6% in tourism or tour guides and 11 or 31% in other businesses, including advertising, vehicle rental, jewellery, manufacturing, and private education. Also, 3 respondents or 9%, indicated they did not want to reveal their businesses. All as shown in Figure 38.

Among the operators, 29 or 83% were still in business while 4 or 11% had closed down and 2 or 6% did not wish to reveal the information. Five business operators had monthly sales/income ranging from 30,000 baht to 4,000,000 baht, averaging 888,000 baht. 12 businesses hired 1-50 staff, averaging 17 staff.

Figure 38: Types of business operators in Chiang Rai (percent)

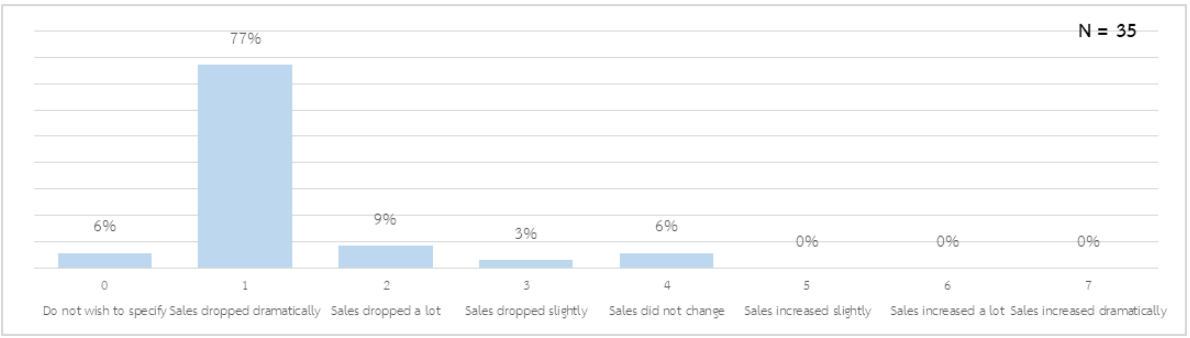


Source: Sal Forest

The research team asked the business operators to rate changes in their sales and numbers of customers or users during the spread of the misinformation. A score of 1 indicated a significant drop, 4 indicated no change and 7 indicated a significant increase in sales/customers/users.

On changes to sales and customers, the respondents indicated average scores of 1.33 and 1.44, respectively. In other words, sales and numbers of customers fell sharply during the misinformation period. A majority or 77% of the operators said their sales/customers dropped tremendously, 9% said they went down considerably, 3% said they went down slightly, 6 said they stayed the same, and 6% did not provide information, as shown in Figure 39.

Figure 39: Scores for changes to sales of businesses in Chiang Rai (percent)



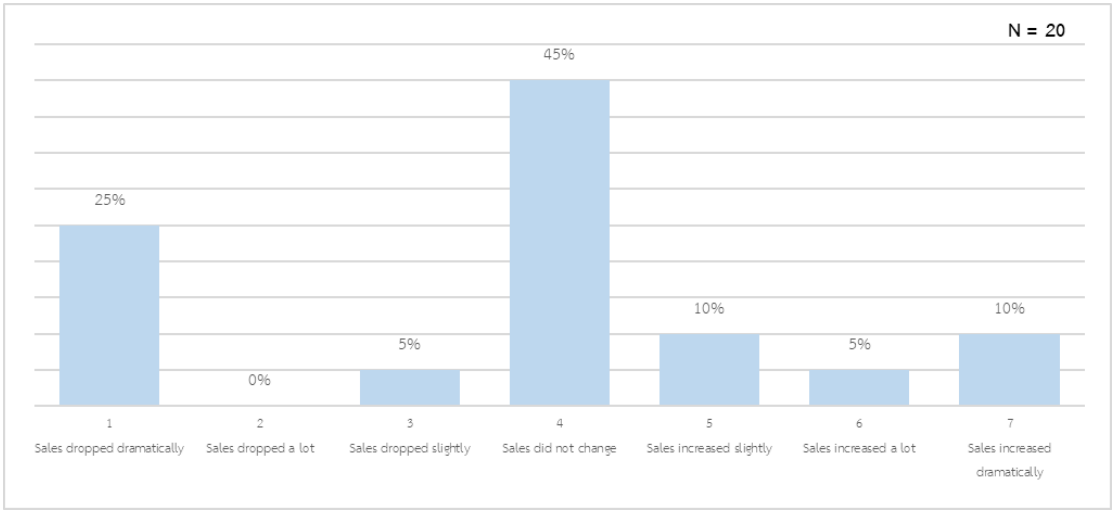
Source: Sal Forest

Slightly more than half of the business operators, 19 or 56%, have online services or deliveries while 15 or 44% do not. Regarding delivery mode, most or 52% have their own channels, 36% rely on delivery platforms such as Grab and Lineman, and the remaining 12% use other delivery channels.

Among the 11 business operators or 58% with delivery channels, most said deliveries account for less than 20% of their total sales volume. Most indicated that delivery sales saw either a slight decrease or no change. Half the operators or 50% said their delivery sales either went down slightly

or did not change, 25% said they went down significantly, 15% said they went up slightly-to-considerably while 10% said they went up tremendously, as shown in Figure 40.

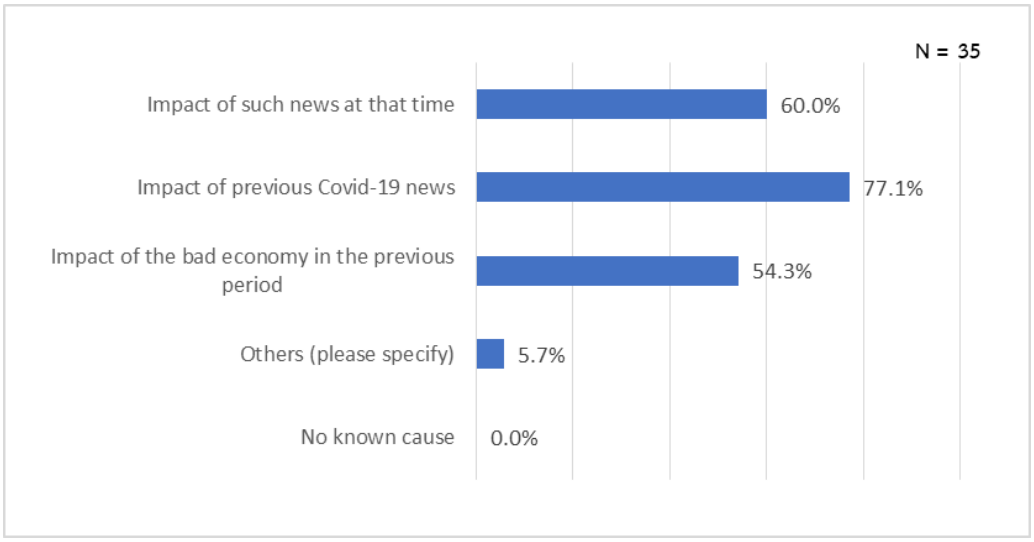
Figure 40: Scores for changes to online/delivery sales of businesses in Chiang Rai (percent)



Source: Sal Forest

As for what caused sales/customers/users to drop (respondents could choose more than one answer), 77.1% said it was a result of the impact of the Covid-19 outbreak from before the misinformation, 60% attributed it to the misinformation, 54.3% said it was a result of the pre-existing economic downturn, and 5.7% said it was a result of other factors such as the government's order for businesses to close and the government's performance in general, as shown in Figure 41.

Figure 41: Causes of drop in sales/customers/users during the misinformation (percent)



Source: Sal Forest

In terms of changes in sales channels usage during the misinformation period, only 1% of the operators reported that delivery sales increased to 31-40% of total sales. However, most operators did not reveal their ratio of delivery sales during the period when the misinformation spread.

As for **impact on hiring staff**, 20 operators or 59% said they changed their hiring policy, 14 or 41% said they maintained it. Five business operators or 25% provided details of how they adjusted their hiring. Among them, 60% reduced their hiring by an average of 3 staff and 20% increased their hiring by an average of 2 staff. In addition, 20% increased compensation for their staff.

ii Impacts on business revenues according to business type

Restaurants

A total of 8 restaurant operators in Chiang Rai participated in the survey. They are all still in business. The restaurants employed 0-50 staff and enjoyed monthly income ranging from 30,000 to 4 million baht during the period when the misinformation spread. Among them, 88% indicated that sales and numbers of customers dropped significantly. As for what caused the plunge, 88% said it was the pre-existing impact of the Covid-19 outbreak, 63% attributed it to the misinformation, and 50% believed it was a result of the pre-existed economic downturn. [figures don't add up]

While all the restaurant operators have delivery channels, 75% rely on delivery platforms while 63% have their own channels. During the spread of the misinformation, 1 operator or 25% reported a highly significant increase in sales while 2 or 13% reported a significant increase. Overall, 38% of restaurant operators reported an increase in sales, 3 or 38% said delivery sales remained unchanged while 2 reported a significant drop in delivery sales. As for hiring, 88% of the restaurant operators adjusted their hiring policy. The highest number for staff terminations was 5 while staff working hours were cut by having staff work every other day.

Wholesale and retail

Among the 6 wholesale and retail business operators that participated in the survey, one has closed down. The respondents reported that they had 4-20 staff during the time of the misinformation. All respondents stated that their sales and customers fell sharply and indicated that they believe that it was the result of the Covid-19 outbreak. A majority or 83% believed that the pre-existing economic conditions contributed to the downturn while only half or 50% selected the misinformation as the cause.

Among the wholesale and retail business operators, 67% have delivery channels. Most deploy their own delivery services which contribute either 21-30 percent or 41-50 percent of their entire income. Over half or 67% of them reported no change in delivery sales. However, half of the wholesale and retail business operators said they had to adjust their hiring practices.

Hotels

A total of 3 hotel operators participated in the survey, all of which are still in business. The respondents employed 4-40 staff. All reported a sharp drop in income and numbers of customers and at least in part attributed it to impacts of the misinformation. 67% said it was a result of the pre-existing impacts of the Covid-19 outbreak. 67% of hotel operators adjusted their terms of employment, with one operator indicating that staff were asked to take 8 unpaid working days off a month.

Tourism and guided tourism

Two tourism and guided tourism operators participated in the survey, one of which has since gone out of business. Both operators reported a sharp drop in sales which they attributed to the pre-existing impacts of the Covid-19 outbreak, economic downturn or the misinformation. The operators

reported only slight change or no change in their online sales. One operator indicated changes in their hiring policy.

In summary, business operators saw a significant drop in sales. Hotel operators indicated that the drop was more attributable to the misinformation than the overall Covid-19 outbreak. Restauranteurs, wholesale and retail operators, and tourism and guided tourism operators picked the pre-existing impacts of the Covid-19 outbreak as the primary reason rather than the misinformation. Most of the operators, especially restaurant owners, adapted by reducing staff working hours.

iii Economic impacts based on in-depth interviews

Chiang Rai Chamber of Commerce

The research team interviewed the chairman of the Chiang Rai Chamber of Commerce (CRCC), as a representative of business operators in the province, to gain insights into any social impacts that may not have been reflected in the survey.

The CRCC chairman was of the view that Chiang Rai's overall economy was only marginally impacted by the misinformation as it only spread for a few days. Besides, he pointed out, local authorities worked together to correct the misinformation by publicising true information so that the fake news didn't have time to cause too much damage.

Ironically, true information about Covid-19, including news about people illegally crossing the border into the country, inflicted much greater damage on the economy. Broadly speaking, hotel operators were the hardest hit. Other business operators did not seem that affected because most had already adapted to the Covid-19 situation.

Chiang Rai Hotels Association

An interview with head of the Chiang Rai Hotels Association (CRHA), representing more than 80 hotel operators in the province, revealed that hoteliers had started adapting to the outbreaks since the first wave of the virus in early 2020, long before the misinformation about Chiang Rai Lockdown spread later the same year. The measures they adopted included staff layoffs, working hour reductions, partial pay cuts and leave without pay days.

The CRHA chairman said that income in the industry fell over 90% as operators were caught in a double bind: not only were there fewer tourists but hotels were forced to cut their rates to appeal to the few remaining customers as occupancy rates fell to around 20%.

The province's tourism sector began to bounce back in early October 2020, as the start of the high season (October-February) coincided with the first wave of the virus dying down. Most visitors were families who preferred mountain destinations such as Phu Chee Fah and Doi Mae Salong to city-based attractions such as Wat Ring Khun or Baan Dam.

When the misinformation about a Chiang Rai lockdown broke on the heels of the true information about illegal crossings into the country of Covid-19 patients, almost all travellers cancelled their bookings, especially those scheduled for December 2020 to January 2021. However, it was almost impossible to differentiate which events caused the cancellations since they occurred almost simultaneously and were directly related.

The association estimated that the news about the illegal border crossings knocked the reservations back 80% while the ensuing misinformation pushed them down further to 95%. The CRHA chairman

expressed the view that the misinformation had a psychological impact and added extra costs to operators as well as generally generating fear and panic. For example, travellers for work such as salespeople might skip Chiang Rai to avoid having to do a 14-day quarantine. That left teenagers with no work obligations as the only group that could stick with their travel plans.

The CRHA did not detect further adjustments following the misinformation. This was because operators had already done all they could to adapt to the Covid-19 situation. All the Association and the Government could do was clarify and correct the misinformation as quickly as possible.

Chiang Rai Hotel Operators

The research team interviewed a hotel operator in Chiang Rai who also said that the impact of the misinformation was less than that of the genuine news about Covid-19 positive people crossing into the country from Mae Sai district. Before the news, which coincided with the province's high tourism season, hotels were doing well with bookings reaching up to 70% throughout December 2020. However, when the news broke about the illegal crossings, bookings from December 1-10 were mostly cancelled. Once the misinformation broke, cancellations hit 100%.

The hotel operator believed that the biggest impact of the misinformation was on people coming to Chiang Rai to work who feared they would have to quarantine which would stop them from continuing to work. In addition, some travellers might have been barred from entering the province due to national Covid-19 travel restrictions. In terms of costs and operational adaptations, the operator said their hotel did not have to do anything extra as it had already reduced staff working hours in response to the existing outbreak conditions.

(4) Medical personnel outside Chiang Rai

A total of 16 medical personnel outside Chiang Rai participated in the survey. Among them, 7 or 44% do not work in the Covid-19 cohort, 5 or 31% are directly involved in Covid-19 control units, and 4 or 25% are in Covid-19 support units.

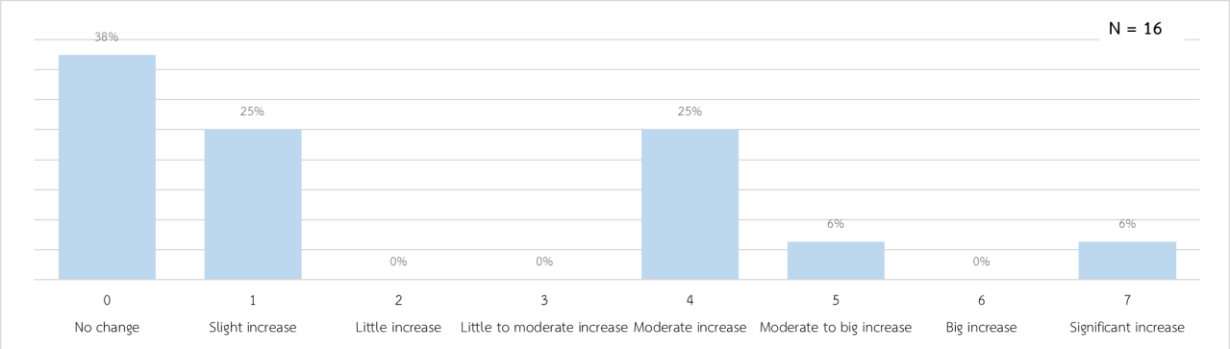
Based on the survey results, the research team classified impacts on the public health system as follows:

i Impacts on Covid-19 screening services

Medical personnel were asked to assess whether the number of people seeking Covid-19 tests travelling to Chiang Rai increased significantly during the period of the misinformation (the first week of December 2020). A score of 0 means no change in the number of people seeking Covid-19 tests travelling to Chiang Rai before and after the misinformation. A score of 7 means the number of test seekers rose significantly. This could affect the hospitals' Covid-19 services as the increase would put a strain on personnel and medical equipment.

The survey found that the number of people travelling to Chiang Rai seeking Covid-19 tests increased only slightly (averaging a score of 2.00). One-fourth or 25% of the medical personnel indicated that the number of people seeking Covid-19 tests travelling to Chiang Rai increased moderately after the misinformation while an equal percentage of respondents saw only a slight increase. A small percentage or 6% said the number of people visiting Chiang Rai and seeking Covid-19 tests there increased significantly while about one-third or 38% said they found no change. All as shown in Figure 42.

Figure 42: Scores for changes in the number of people travelling to Chiang Rai and seeking Covid-19 tests in hospitals outside Chiang Rai (percent)



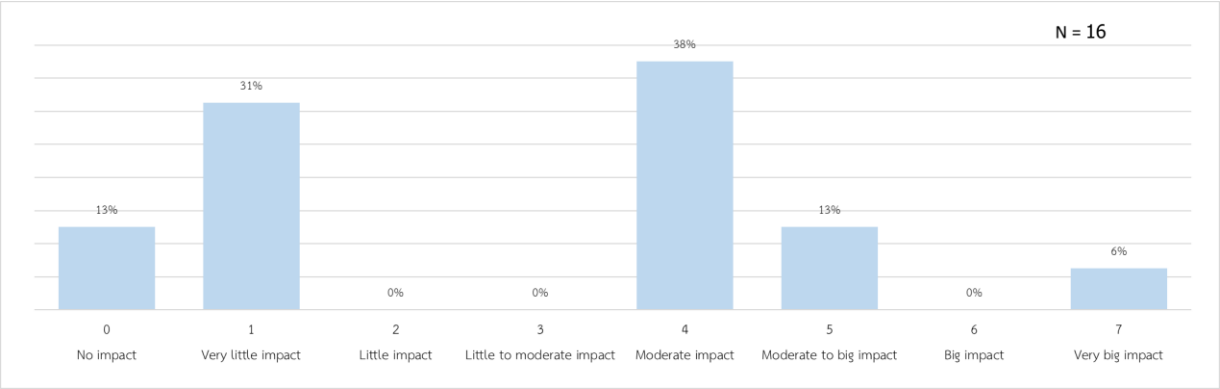
Source: Sal Forest

ii Impacts on medical personnel

The medical personnel were asked to assess the impacts of the misinformation in their work area on a scale of 0-7, with 0 indicating no impact and 7 indicating significant impact.

The survey results indicated that the impacts of the misinformation on the medical personnel's work was small (an average score of 2.88), with 13% saying they were not affected, 31% saying they were slightly affected, 38 saying they were moderately affected, 13% saying they were significantly affected, and 6% saying they were extremely affected. When it came to hindrances to their work, 56% of the respondents pointed to constraints in servicing patients due to their hospital's management system, 44% cited inadequate medical equipment while 31% said there were not enough medical personnel. Around one-third or 31% of the medical personnel said the misinformation did not pose any obstacle to their work. All as shown in Figure 43.

Figure 43: Scores given to the impact of misinformation on medical personnel outside Chiang Rai (percent)



Source: Sal Forest

iii Impacts on the public health system concerning care for general patients

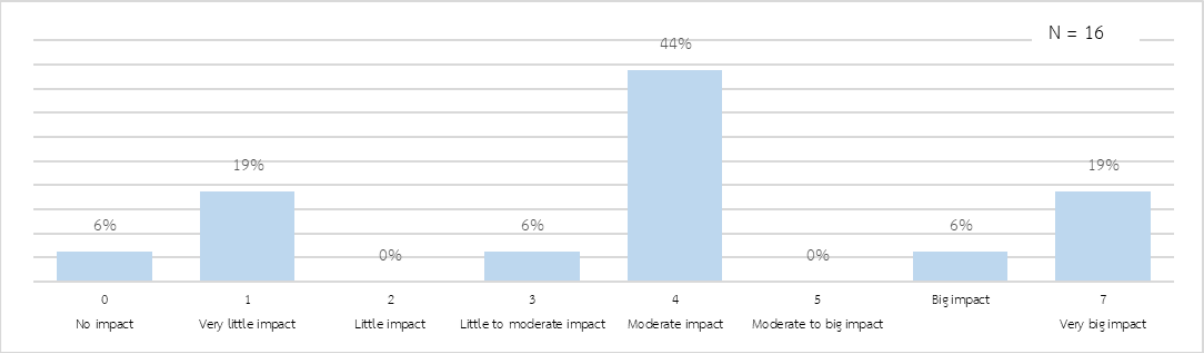
The impact on the public health system in regards to care for non-Covid-19 patients was measured by respondents (medical personnel). The respondents were asked to assess the impact on non-Covid-19 patients on a scale of 0-7, with zero connoting no impact from the false claims and 7 connoting a significant impact.

The survey results show that during times when the false claims proliferated, general patients who sought hospital services were moderately affected (with an average score of 3.81%).

Almost half (44%) of respondents indicated that general patients were moderately affected while 19% rated the impact as small. Only 6% of the respondents rated the impact as minute but 19% said the impact was significant. The remaining 6% said false information did not produce any impact.

A majority (81.3%) of respondents said the impact on general patients was due to hospitals postponing the appointments of patients who did not need urgent treatment. Another 37.5% said it was because there were not enough resources for general patients, as displayed in Figure 44.

Figure 44: Scores given to the impact of false claims on the care of general patients in hospitals outside Chiang Rai (percent)



Source: Sal Forest

The survey found that the impact of false information on the capacity of the public health system outside Chiang Rai was small to moderate.

From the point of view of medical personnel, those who were affected were non-Covid-19 patients who needed non-urgent treatment thus saw their appointments delayed. The misinformation carried a small impact on medical resources, equipment and personnel numbers.

(5) Medical personnel in Chiang Rai

A total of nine medical personnel[18] who worked in Chiang Rai took the survey. Of these, 44% (four respondents) do no work in areas related to Covid-19 control units. The same percentage and number (44% and four respondents) were employed in units that supported the control of Covid-19 while 11% (one respondent) was directly deployed in a Covid-19 control unit.

Based on the respondents' answers, the research team classified the impact as followed:

i Impacts on Covid-19 screening service

The impact on the Covid-19 screening service was measured by an assessment of whether the number of people seeking Covid-19 tests had increased after the emergence of misinformation.

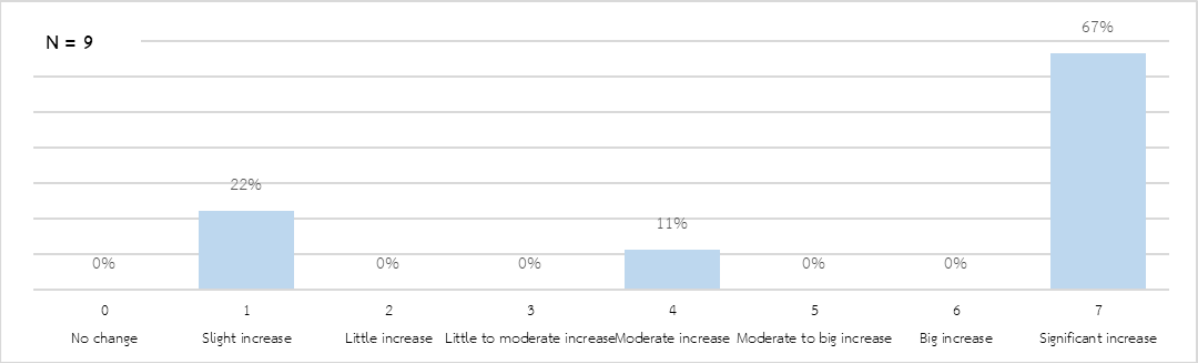
[18] Since the number of participants is small, the result could deviate from reality.

The medical personnel who took the survey were asked to rate the impact on a scale of 0-7, with zero meaning the number of people seeking Covid-19 tests was unchanged before and after the misinformation and seven meaning the number of people seeking the test increased significantly.

An increase of people seeking Covid-19 tests could affect hospitals Covid-19 screening services as it could put a strain on medical personnel and equipment.

The survey results indicated that the number of people seeking Covid-19 tests increased significantly during the emergence of the false claims. More than half (67%) of medical personnel said that the number of people seeking Covid-19 tests increased significantly compared to before the misinformation. Almost a quarter (22%) said the increase was small while 11% said there was a moderate rise in the number of people seeking Covid-19 tests compared to before the false claims, as shown in Figure 45.

Figure 45: Scores given to the change in the number of people seeking Covid-19 tests at hospitals in Chiang Rai (percent)



Source: Sal Forest

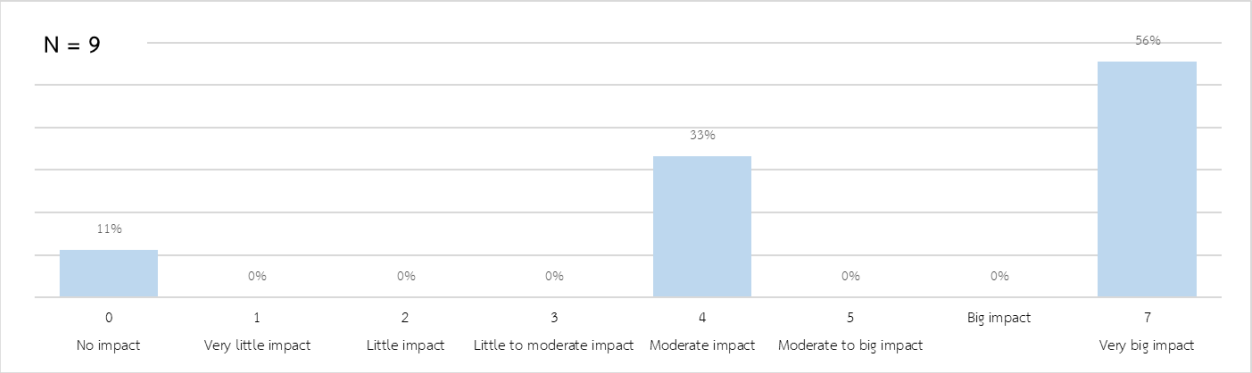
ii Impacts on medical personnel's performance

The impact on medical personnel's performance was based on assessments made by medical personnel in Chiang Rai, using a score of 0 -7 with 0 meaning no impact and 7 meaning a significant impact.

The survey found that the work of medical personnel was significantly affected during the proliferation of false information, with 56% saying they had been significantly affected, 33% saying they experienced moderate impact, and 11% saying they had not been affected at all, as shown in Figure 46.

Slightly over half of the respondents (56%) cited inadequate medical equipment as a hindrance, followed by 33% who said the hospitals could not manage to serve patients efficiently. Another 33% said there was not enough medical staff while 11% said the misinformation did not pose an obstacle to their work.

Figure 46: Scores given to the impact of misinformation on medical personnel in Chiang Rai (percent)



Source: Sal Forest

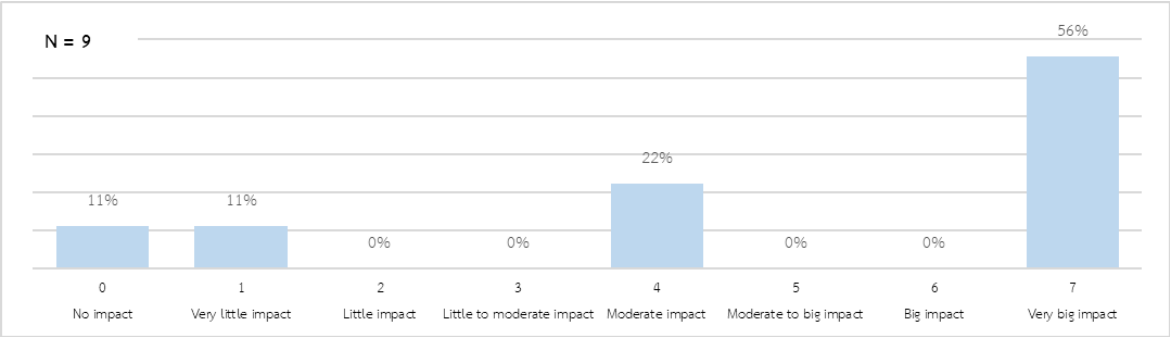
iii Impacts on public health service provision to non-Covid-19 patients

Impacts on general patients were measured by having the medical personnel assign scores of 0 to 7, with 0 indicating no impact and 7 indicating significant impact.

The survey found that during the period of the misinformation, non-Covid-19 patients received moderate to heavy impacts, with 56% indicating they were heavily affected, 22% moderately affected, and 11% indicating no impact, as shown in Figure 47.

Most of the impacts were attributed to hospitals having to postpone appointments for non-emergency patients (89%) followed by inadequate resources (11%).

Figure 47: Score given to the impact of misinformation on non-Covid-19 patients in hospitals in Chiang Rai (percent)



Source: Sal Forest

Overall, the survey found that the capacity of the public health system in Chiang Rai in regards to Covid-19 screening and performance of medical workers was significantly impacted when the misinformation was spreading. The causes included increased numbers of people seeking Covid-19 tests and inadequate medical personnel and equipment.

Non-Covid-19 patients not requiring urgent treatment were inconvenienced because medical resources became inadequate and their appointments were postponed.

However, it should be noted that most of the medical personnel taking part in the survey were not directly involved in Covid-19 aspects, so there may be some inconsistencies in the results.

iv Impacts on Chiang Rai public health system based on in-depth interview

To gain insight into social impacts that may not be reflected in the survey results, the research team conducted an interview with Dr Somsak Uthaipiboon, deputy medical director of Chiang Rai Prachanukroh Hospital as a representative of medical personnel in Chiang Rai.

Dr Somsak indicated that the lockdown misinformation did not impact either his hospital's capacity or the province's public health system in general.

Services to both Covid-19 and non-Covid-19 patients proceeded efficiently during the period when the misinformation spread, he said. This was partly due to the fact that the hospitals had made adaptations since the first wave of the virus, including reorganising space to separate general patients from those in risk groups, drawing up plans for reallocation of medical personnel and resources according to scenarios of different levels of outbreak, and taking measures to ensure sufficient medical resources for at least three months.

Dr Somsak did not think that either the misinformation about the lockdown or the true news about illegal migration of Covid-19 positive people had caused much additional alarm among Chiang Rai residents. People still sought treatment at hospitals relatively normally. The average number of visitors remained at about 2,800 per day compared to 3,000 per day previously whereas the first wave of the virus saw hospital visits fall as low as 2,000 per day. Nor did Dr Somsak detect any out of the ordinary rise in the number of people seeking Covid-19 testing during the misinformation.

When the news about the cluster of immigrants arose, the hospitals worked with government units on active case findings among risk groups. This helped the hospitals contain the impacts of the news without having to deploy contingency plans. As for the patients, the hospitals reached out to them, asking them not to visit hospital unless really necessary. This prevented congestion and avoided putting the public health system at risk if the outbreak was to worsen.

3.1.3 Summary of social impacts of misinformation in the case of Chiang Rai

Using the logic model to assess impacts of the lockdown misinformation, combined with analysis of the survey results and in-depth interviews with stakeholders, the research team tested the findings against the assumptions and identified six chains of impact, as follows:

1. Assumption: The capacity and resources of Chiang Rai public health provision could be compromised because more people could seek Covid-19 tests. The findings from the sample group comprising residents of Chiang Rai indicated that most people did not seek Covid-19 tests during the specified period.

Finding: From the perspective of medical personnel in Chiang Rai, the number of people seeking Covid-19 tests increased at a rate that could impact the performance of medical workers. This in turn put stress on public health resources in the province, whether in terms of medical equipment availability, medical personnel, or hospital capacity to service all patients, especially Covid-19 services.

A representative of medical personnel in Chiang Rai who was interviewed indicated that the number of people seeking Covid-19 tests did not change from normal levels. They also said that medical resources were not impacted by the misinformation. These assessments correspond with views of medical personnel outside Chiang Rai who pointed out that the number of people coming from

Chiang Rai seeking Covid-19 tests was unchanged, and there was hardly any impact on the capacity of the public health system outside the province.

2. Assumption: Impacts on the health of Chiang Rai residents. Since people could avoid visiting hospital, they could fail to receive timely treatment or have to pay more for care.

Finding: The results of the survey of Chiang Rai residents found that, overall, they drastically cut down on trips to hospital (although the drop was less than visits to malls, pubs or bars). The results corresponded with the ratio of patients avoiding doctor's appointments during the period (almost half the sample group did not have an appointment during the period). However, since most Chiang Rai residents in the sample group did not have underlying diseases requiring continuous treatment, the cost of care or delayed treatment was not expected to have much effect on the health of people in Chiang Rai overall.

Medical personnel were of the general view that non-Covid-19 patients not requiring urgent treatment were adversely affected by having their appointments postponed.

3. Assumption: Impacts on business operators in Chiang Rai. Exports via Mae Sai border crossing could increase to avoid consequences of a lockdown which would block border trade.

Finding: Since there were no exporters among the sample group of business operators in Chiang Rai, the research team could not make any impact assessment.

4. Assumption: Impacts on Chiang Rai business operators. If people outside Chiang Rai couldn't visit the province for business or tourism, the overall economy, especially the hospitality sector, could suffer.

Finding: The findings of the survey indicated that most non-Chiang Rai residents intending to travel to the province were tourists. Based on survey data and tourism statistics, the research team estimated the damage caused by trip cancellations during the week when the misinformation about the lockdown spread at about 28 million baht.

The stakeholder groups, including tourists, workers, visitors to relatives, and those passing through to another province, listed social impacts such as failure to spend time with family members, waste of money spent reserving accommodation, and lost business opportunities and customers. However, the stakeholders did not clearly quantify of specify the nature of the damage.

Hotel operators in Chiang Rai said that their sales to people outside Chiang Rai who either cancelled or postponed their trips to Chiang Rai plunged drastically during the period, with cancellations or postponements of accommodation bookings at around 80%. However, since in this case the impacts on business operators were caused by the true news about illegal immigrants who were Covid-19 positive, the research team could not single out any impact caused exclusively by the misinformation.

5. Assumption: Impacts on business operators and Chiang Rai residents caused by behavioural changes, including travelling and spending less.

Finding: The sample group of Chiang Rai residents reported a reduction in spending by 34-67%. Calculated against usual spendings by households in Chiang Rai, the research team estimated that the lockdown misinformation prompted Chiang Rai residents to spend 367.5-724.2 million baht less during the week of its spread. The businesses most affected were those in the service sector, night-time entertainment and department stores. This also corresponded to the behavioural changes of Chiang Rai residents which included visiting these places less.

Businesses involving consumer goods, fresh food, and cooked food from out-of-mall shops, fresh markets, street vendors and shops located near work places, were less affected because people in Chiang Rai still bought these products and visited these places.

All business operator respondents in Chiang Rai said their sales dropped drastically during the misinformation. Most operators responded by cutting staff. The majority of operators believed that the impacts were mainly caused by news that occurred before the misinformation, followed by the misinformation itself. However, too few operators gave sufficient information to make a quantitative analysis.

6. Impacts on business operators and residents in Chiang Rai from behavioural changes prompting more spending online and deliveries.

Finding: The survey found that the majority of respondents turned to online payments rather than continuing to use a card or cash. The result corresponds with responses from business operators who said they only saw a slight drop in deliveries after the misinformation. Deliveries only accounted for 20-30% of total sales, the total volumes of which did not increase significantly during the misinformation spread. This indicates a limited impact. However, again, too few operators gave sufficient information from which to make a quantitative analysis.

3.2 The Samut Sakhon case study

For the case study of misleading news in Samut Sakhon, and to compare the impact with that of the fake news case in Chiang Rai, the research team used the news article "Canned fish factory in Samut Sakhon: Public Health Ministry confirms over 900 workers with Covid-19" as the original source for study. This news was widely disseminated starting in the first week of January 2021 and circulated across social media for one week, according to an analysis by Wisesight.

3.2.1 Social impact model

The research team set an assumption that once receiving the news, individuals would recirculate the story across various channels, including Facebook, Line, Twitter or by word-of-mouth, resulting in public fears that the pandemic was escalating and resulting in an impact in seven different aspects (see Exhibit 48)

1. Those hearing the news may be encouraged to go for screening for Covid-19 (both within and outside the province) potentially negatively impacting public health resources.

2. Residents in Samut Sakhon may delay regular health care appointments, particularly those with chronic illnesses, potentially delaying treatments, increasing costs and negatively affecting their health.

3. Residents may reduce spending on products related to the news, in this case canned seafood and other processed foods, negatively affecting business revenues, employment, income levels and the provincial economy.

4. Residents in other provinces may cancel travel to Samut Sakhon, negatively affecting economic activity and business revenues and leading to higher business closures and unemployment.

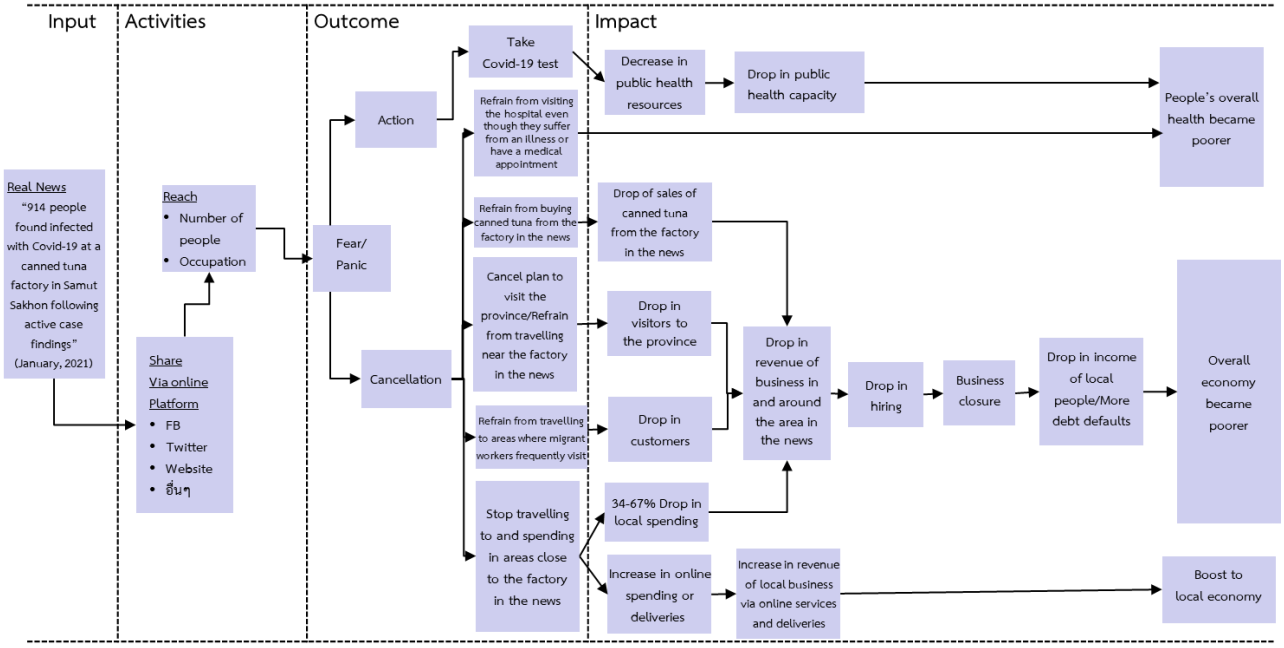
5. Residents in Samut Sakhon may reduce their travel outside of their homes, affecting the local economy and business revenues and leading to higher business closures and unemployment.

6. Residents in Samut Sakhon may reduce their travel outside of their homes and shift spending online instead, potentially helping businesses with online channels and delivery services.

7. Residents in Samut Sakhon and those travelling to the province will avoid the area near the factory mentioned in the news reports and foreign worker communities, affecting business activity, employment and the economy.

Based on this model, there are five groups potentially affected by the misleading news report: residents of Samut Sakhon; businesses in Samut Sakhon; medical professionals in Samut Sakhon; medical professionals outside of the province; and residents of other provinces who need to travel to the province in the time period in question.

Figure 48: A logic model of the impact on the misleading news about 914 covid-19 cases in Nautilus factory in Samut Sakhon



Source: Sal Forest

3.2.2 Social impact of Covid-19 related news

This section will review the findings of a survey related to the impact of Covid-19 related news and Samut Sakhon on five groups: residents outside of Samut Sakhon; residents in Samut Sakhon; businesses in Samut Sakhon; and medical professionals both outside and inside of Samut Sakhon.

(1) Non-residents of Samut Sakhon

i Economic impacts

The impact model presumes that residents outside of Samut Sakhon would reduce travel to the province, affecting economic activity. Based on a survey of outside residents who had planned to travel to Samut Sakhon, eight out of 25 respondents (32%) cancelled or postponed travel while the remainder maintained their travel plans unchanged.

Travel statistics (Ministry of Tourism and Sport, 2021) show that Samut Sakhon recorded zero tourists and no tourism revenues for January 2021. In contrast, in December 2020, the province had 5,071 visitors or an average of 1,267.75 per week, contributing revenues of 8.8 million baht or 2.2 million baht per week to the province or 1,751.13 baht per visitor.

Based on these statistics, tourism to Samut Sakhon fell by 1,268 visitors in January compared with the previous month. Based on these figures, and assuming that 32% would cancel travel plans as a result of the Covid-19 news, the number of lost tourists for the month as a result of the news is estimated at 406. Using average spending per tourist of 1,751.13 baht, the overall economic impact is equal to 710,538.5 baht over the course of the first week of January (see Table 3).

Table 3: Estimates of lost revenue from tourism during the period when the misinformation spread: Samut Sakhon case study

	Survey samples (persons)	Sample proportion (percent)
Number of persons who plan to go to Samut Sakhon	25	100
Number of persons who cancelled their trips due to fake news	8	32
Number of visitors dropped during Nov-Dec 2020 (person per week)	1,268	
Estimate number of visitors dropped due to fake news (person per week)	1,268 persons x 32% = 406*	
Estimate revenue loss due to fake news (baht)	406 persons x 1,751.13 baht = 710,538.5**	

Source: Sal Forest, Ministry of Tourism and Sports, *calculated based on percentages from the sample groups, **calculated based on average spending per person by the visitors in December of 1,751.13 baht (because there was no visitor in January 2021).

This extrapolation has four caveats.

1. The research team does not know the actual data on the reduction in visitors for the first week of January, but rather estimated the number based on monthly data, which ignores possible variance in weekly visitor numbers over the course of the month. If the number of lost visitors for the first week of January is higher than 406, then the

economic impact would be also higher. As well, according to data from the Ministry of Tourism and Sport, Samut Sakhon recorded no visitors in January 2021, likely due to state restrictions on travel into the province. The research team is unable to assess to what extent the decline in travel was the result of cancellations due to news reports or state travel restrictions.

2. Travel cancellations may be attributed to various factors. For instance, news reports in Samut Sakhon occurred at the same time as news of new outbreaks in several places in the area as well as a tightening of control measures by authorities. As a result, travellers may not be able to stipulate the weighting assigned to any one factor behind their decision to cancel their trip, resulting in an inability for the research team to precisely calculate the damage from the news report in question.

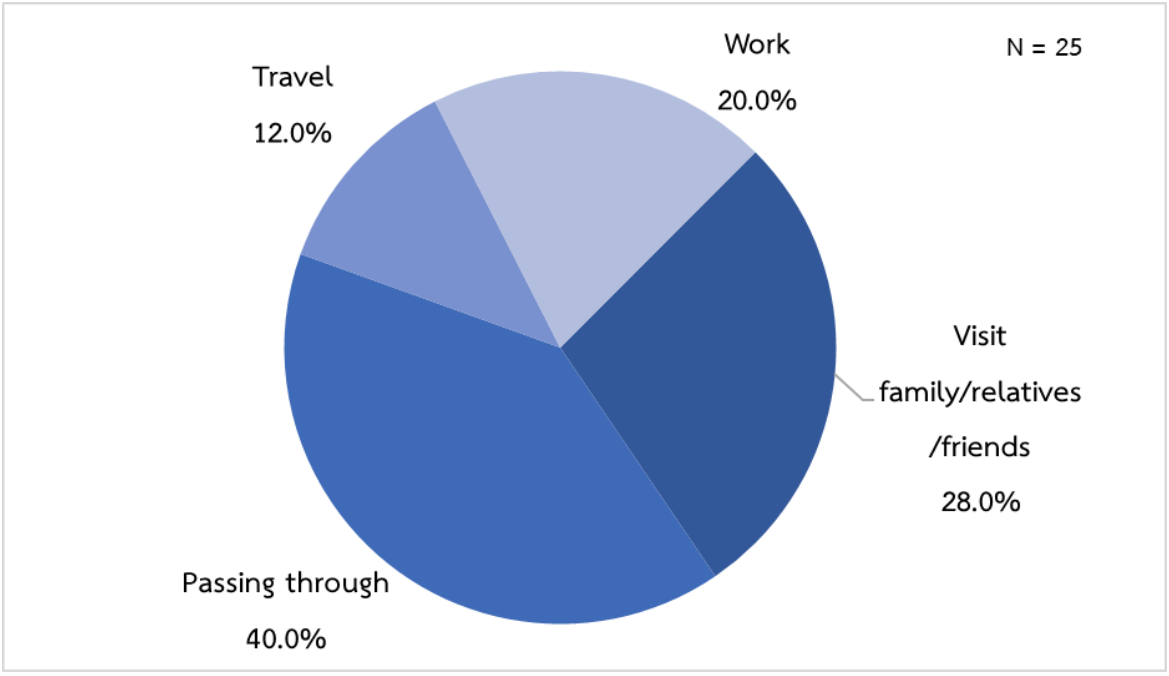
3. The small sample size of the study may result in distortions in the number and proportion of cancellations calculated, potentially resulting in a higher or lower damage value.

4. The assessment of economic losses to Samut Sakhon from travellers and visitors may be higher than reality as most visitors are not visiting for tourism, but rather passing through the province.

ii Social impacts

Based on a qualitative analysis of travel objectives, of those residing outside of Samut Sakhon, three people or 12% planned to visit the province for tourism or leisure; seven people or 28% to visit family or relatives; 10 people or 40% to travel through the province; and five people or 20% for work reasons. (see Figure 49)

Figure 49: Purposes of visits to Samut Sakhon by non-residents (percent)

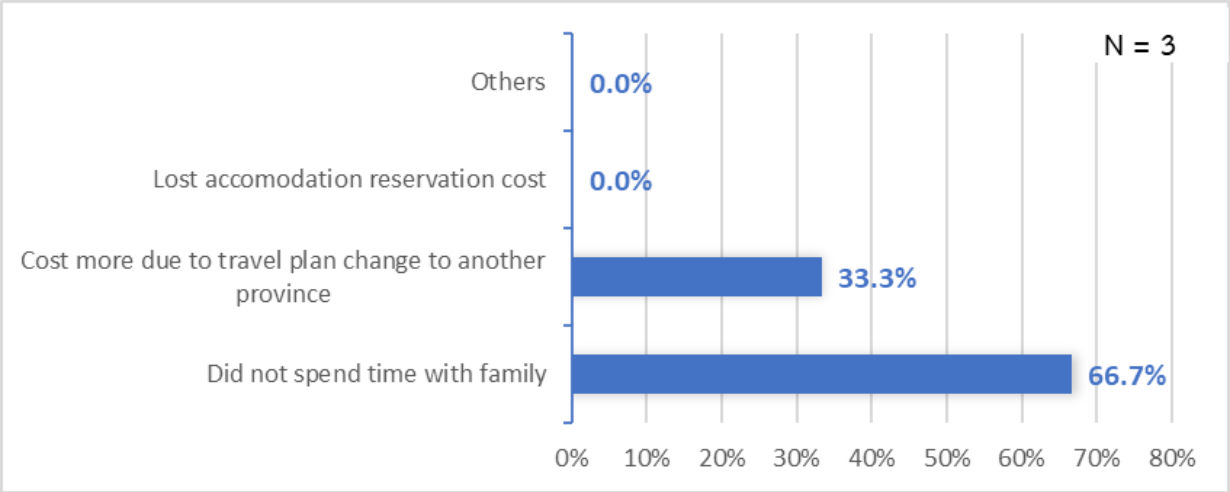


Source: Sal Forest

Tourists

The response of the tourist group of three people[19] found that all decided to cancel or postpone travel, resulting in multiple effects. For instance, 66.7% of the tourists reported a lost opportunity to spend time on leisure or with family and 33.3% reported losses of hotel deposits (see Figure 50)

Figure 50: Impacts of non-residents who planned to visit Samut Sakhon (percent)



Source: Sal Forest

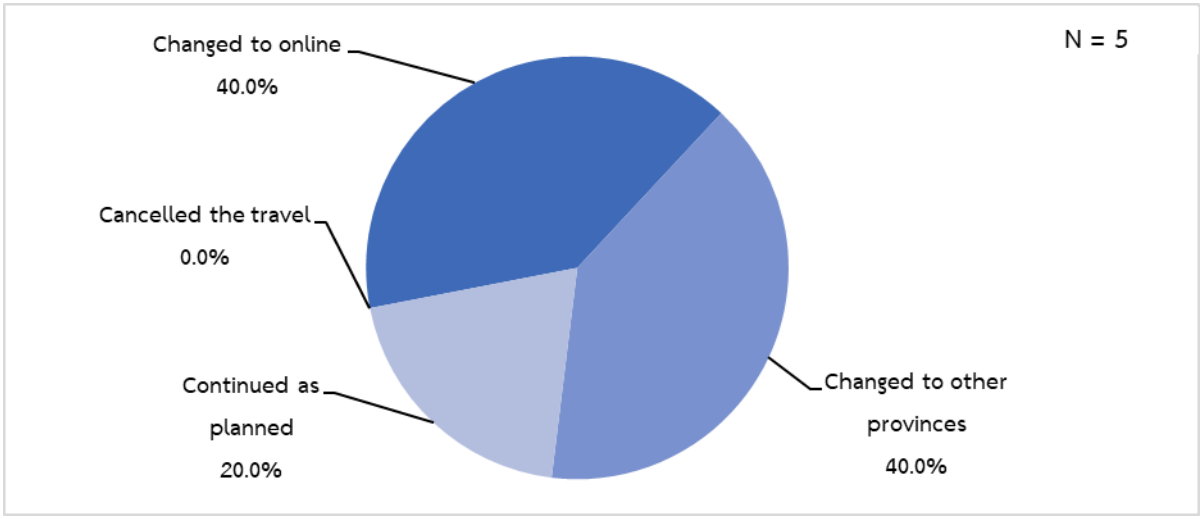
In summary, travellers cancelled or postponed travel to Samut Sakhon after hearing the news. The social impact on tourists was seen in lost opportunities for leisure and time with family as well as financial losses in the form of lodging deposits.

Workers

There were five people who resided outside Samut Sakhon with plans to travel to the province for work reasons.[20] After learning of the news, all five cancelled or postponed their trips. Of the group, 40% changed to remote work, another 40% changed to travel to other provinces while 20% maintained their travel plans. (see figure 51)

[19] Due to a small sample size, the analysis may be inaccurate.
[20] Due to a small sample size, the analysis may be inaccurate.

Figure 51: Responses of non-residents who planned to go to work in Samut Sakhon (percent)



Source: Sal Forest

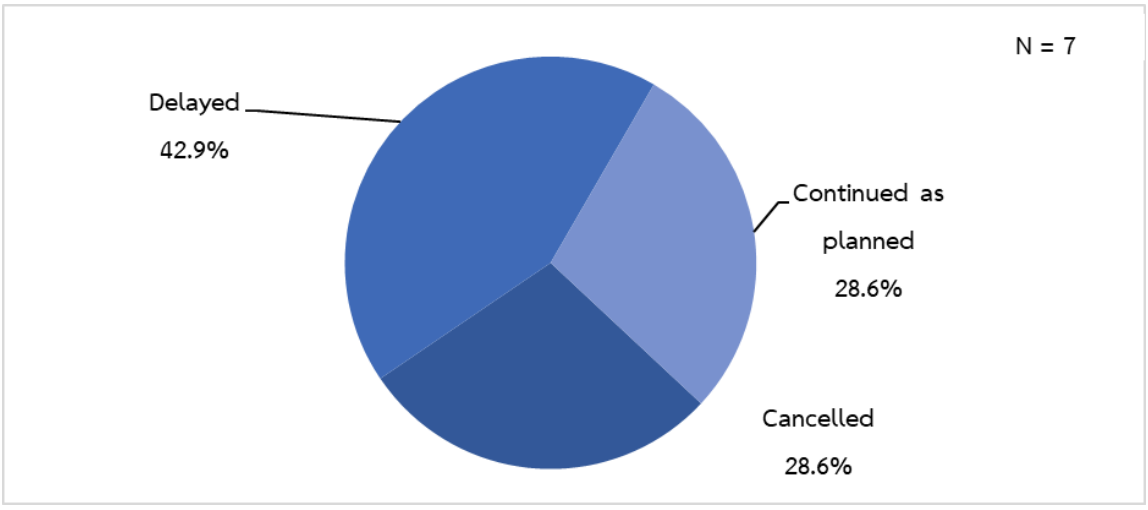
Of the four people who cancelled travel plans to Samut Sakhon or changed to travel to other provinces, no information was given regarding the impact on their work.

Overall, the economic impact on Samut Sakhon from those with plans to travel to Samut Sakhon for work and who shifted to other provinces or remote work was limited. No information was given by those affected of the business cost or value involved.

People who planned to visit relatives/family members/friends

There were seven respondents who stated that they planned to travel to Samut Sakhon to visit relatives, family or friends during the time period. Of this, 28.6% continued their trips, 28.6% cancelled their trips and 42.9% postponed their trips. (see figure 52)

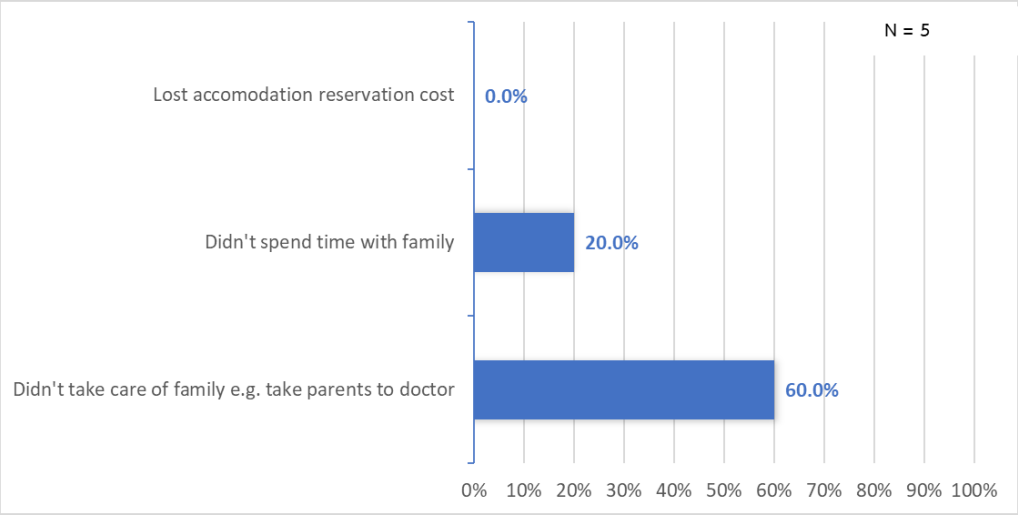
Figure 52: Responses of non-residents who planned to visit relatives/family members/friends in Samut Sakhon (percent)



Source: Sal Forest

Of those who cancelled or postponed their travel, 20% reported an impact from not being able to spend time with their family while 60% reported an impact from being unable to take care of their relatives. (see figure 53)

Figure 53: Impacts on non-residents who planned to visit relatives/family members/friends in Samut Sakhon (percent)



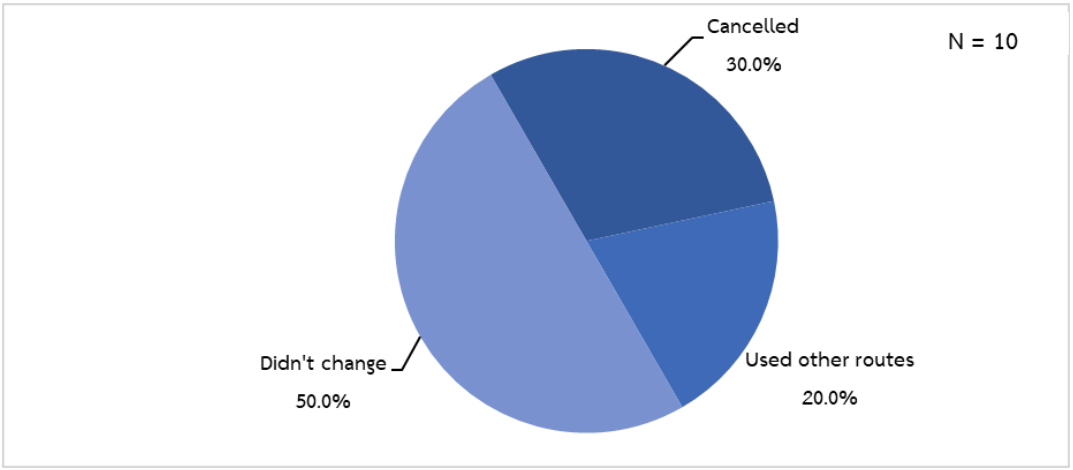
Source: Sal Forest

Overall, of those travelling to visit relatives, family or friends, most decided to cancel or postpone their travel, with a limited economic impact on the province. The social impact was seen in terms of lost opportunities to visit with family or relatives.

Travellers passing through Samut Sakhon

Ten respondents reported plans to travel through Samut Sakhon, with 30% deciding to cancel their trips outright, 20% adjusting their travel to bypass Samut Sakhon and 50% maintaining their travel plans unchanged. (see Figure 54)

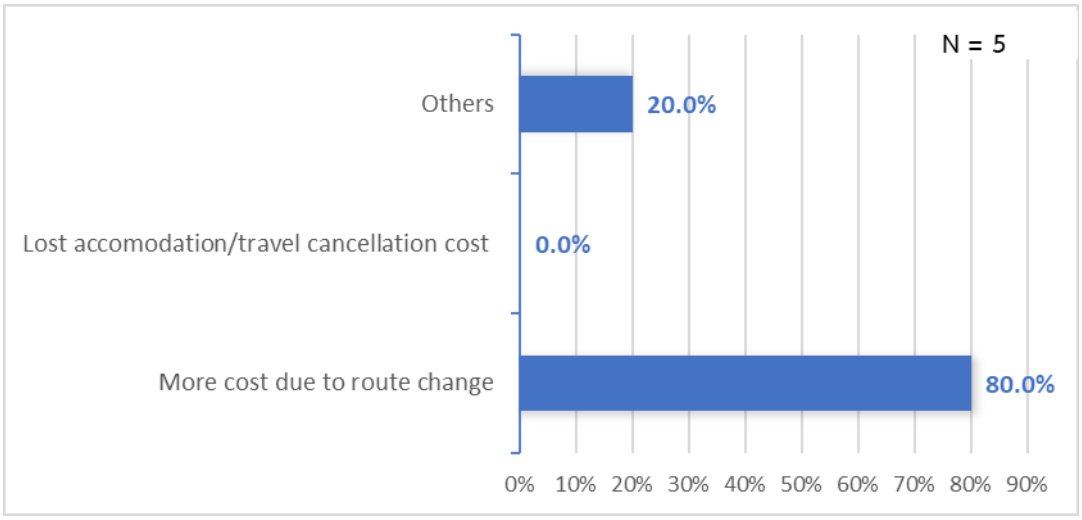
Figure 54: Responses of non-residents of Samut Sakhon who planned to pass through the province (percent)



Source: Sal Forest

In terms of impact, 80% of travellers passing through Samut Sakhon reported incurring higher travel expenses while 20% reported other lost opportunities. (see Figure 55)

Figure 55: Impacts of non-residents of Samut Sakhon who planned to pass through the province (percent)

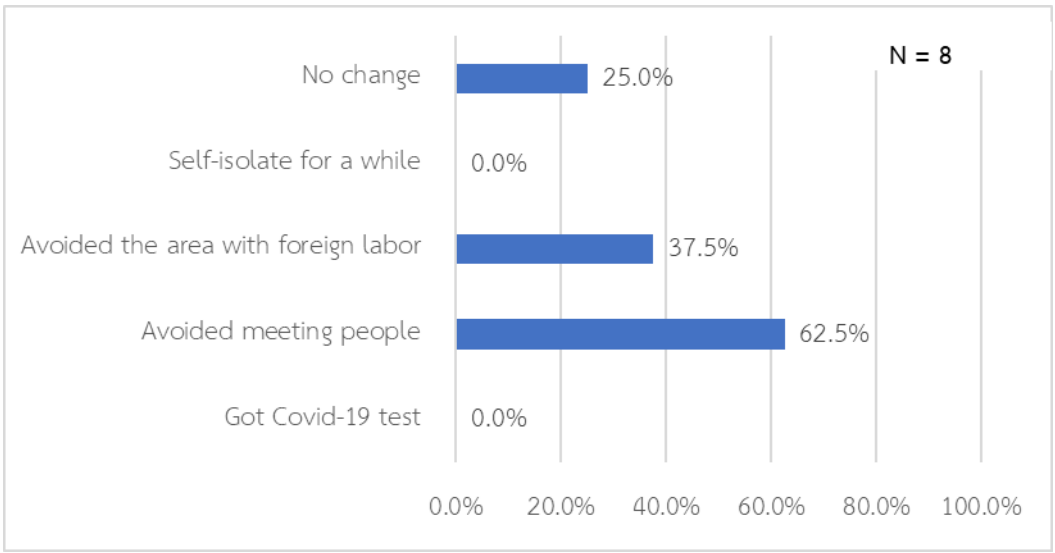


Source: Sal Forest

Visitors who maintained travel plans to Samut Sakhon

Eight respondents maintained travel plans to Samut Sakhon. Of this group, 62.5% avoided outbreak areas within the province while 37.5% also avoided areas frequented by foreign workers. Only 25% of the group reported not changing their behaviour. None in the group reported seeking a Covid-19 test or undergoing self-quarantine following their visit. (see Figure 56)

Figure 56: Behavioural change after travelling to Samut Sakhon (percent)



Source: Sal Forest

(2) Samut Sakhon residents

i Economic impacts

Of the sample group of 26 Samut Sakhon residents[21], spending was found to be moderately impacted,[22] with a decline of 34% to 67% from normal levels.

According to the National Statistical Office, household expenditures in Samut Sakhon in 2020 was estimated at 23,993 baht per month with 370,048 households within the province.

The research team calculated the reduction in spending at 8,157.7 baht to 16,075.4 baht per month based on an estimated decline of 34% to 67% from normal, or a decline of 2,039.4 to 4,018.9 baht per week. As a result, overall economic losses on the province are projected at 754.7 million baht to 1.487 billion baht. [see Table 4]

Table 4: Estimates of the drop in spending by people in Samut Sakhon during the spread of misinformation: Samut Sakhon case study

Monthly household spending in Samut Sakhon (baht)	Number of households in Samut Sakhon	Proportion of average spending drop of the sample group (percent)	Spending drop per month per household (baht)	Spending drop per week per household (baht)	Total spending drop (million baht)
23,993	370,048	34	8,157.7	2,039.4	754.7*
		67	16,075.4	4,018.9	1,487.2*

Source: Sal Forest

The decline in consumption could be seen across various categories.

Goods with no change or a minor increase[23] in sales

1. Medicines

Goods with a minor decline in sales

1. Fresh/processed food and beverages

2. Fresh/processed seafood from outside of the province

Goods with a moderate decline in sales

1. Alcohol, beer and cigarettes

[21] 15 out of the 26 Samut Sakhon residents reported being business owners or medical professionals

[22] The research team defined changes of zero to 33% as minimal; 34% to 67% as moderate; and over 67% as significant.

[23] The research team defined changes of zero to 33% as minimal; 34% to 67% as moderate; and over 67% as significant.

2. Fresh/processed seafood sourced from the factory mentioned in the news

3. Household products such as soap, shampoo or cooking gas

4. Durable goods such as electrical appliances, furniture or automobiles

Goods with a significant impact in sales

1. Service industries such as restaurants, spas or tourist venues

2. Luxury goods such as cosmetics

In terms of spending patterns, Samut Sakhon residents significantly increased spending to online and delivery services (5.73 out of 7 points[24])

Overall, the shift in spending patterns indicates that the reduction in consumption most affected service industries that has no online or delivery component. Shopping malls also saw an impact from the decline in luxury goods spending. For night entertainment businesses, even though people reduced travel significantly (details in the next section), the impact may be mitigated if they have a good sales channel as spending on this group of products did not decline as much as in the case of Chiang Rai. With regards to sales of seafood products, fresh and processed seafood from sources outside of the province was not affected, although sales of fresh and processed seafood from the factory mentioned in the Covid-19 news reports did see a moderate decline.

ii. Social impacts

In terms of social impact, the research team studied changes in everyday behaviour based on four dimensions of the news; the proximity of one's residence to the factory in question; travel patterns within the province; travel to public areas; and health preventative measures taken by residents.

Location of residence facilities 92.3% of respondents said they did not live within 5 kilometres of the factory while 7.7% did.

Travel patterns within the province Most respondents (85.2%) travelled within the province using their own passenger car or motorcycle. Others travelled using public transportation or in cars of their work colleagues or supervisors (7.4%).

In general, residents reduced travel using their own vehicles only slightly. Those dependent on relatives, friends or colleagues reduced travel slightly higher, while those using public transportation avoided travel the most.

Those using public transportation (7.4%) did have an impact, including higher expenses, from having to shift to other modes of transport such as personal vehicles.

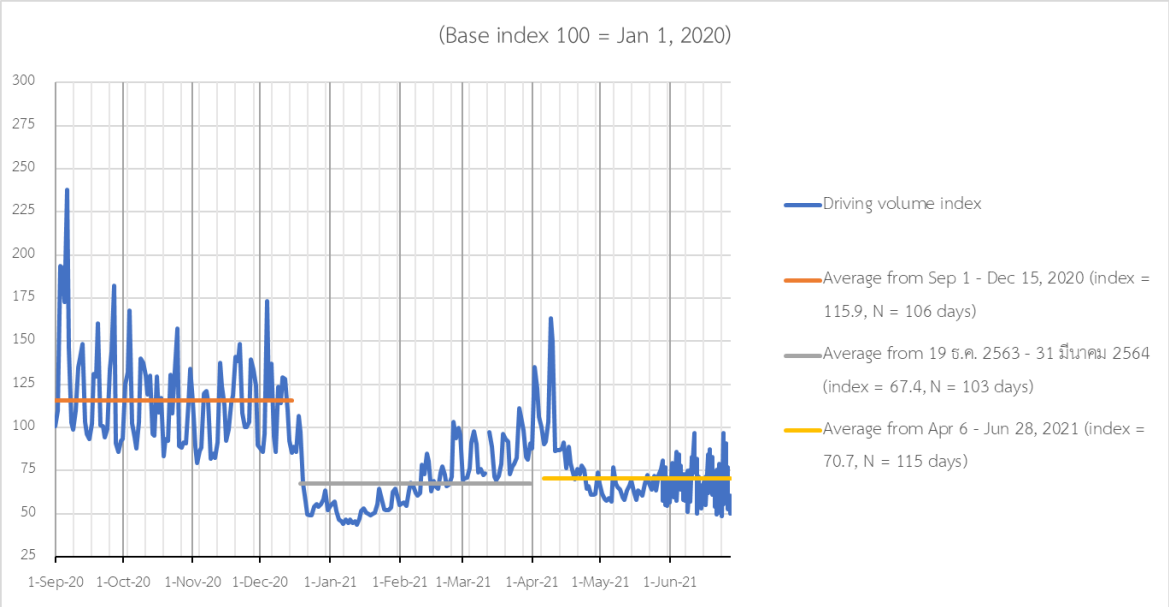
Apple's Mobility Trend Report tracks movement only for drivers, rather than those walking or in transit. Nevertheless, the news reports regarding the pandemic during the period of late December 2020 to early January 2021, potentially did have an impact on travel. The

[24] On a scale of 1-7, a score of 4 represents no change in spending patterns; 1 a higher increase in cash spending; and 7 a higher increase in online/delivery spending.

Mobility Report declined to 67.4 for the period end-December 2020 to 31 March 2021, compared with 115.9 from September 2020 to December 2020, or a decline of 41.8%. The index showed a clear rebound up until the emergence of the third wave of the pandemic.

If comparing the index average during the period the news was disseminated with the third wave from April 2021, the index increased during the third wave by 4.9% to 70.7 from 67.4, a relatively insignificant increase. (see Figure 57)

Figure 57: Driving index of people in Samut Sakhon from Apple's Mobility Trends



Source: Sal Forest

Travel to public areas: Respondents reduced travel to public areas overall due to increased fears and safety concerns during the period news of the outbreak circulated. Travel to recreational areas such as cinemas, public parks, sporting facilities, gyms, game rooms, entertainment venues, bars and locations near the factory mentioned in the news was most affected.

Affected to a lesser extent was travel to flea and fresh markets, restaurants outside of shopping complexes and retail stores. Only moderately affected in terms of travel were medical facilities, while travel to work was only slightly affected.

The impact from behavioural changes on business operators varied, with owners of night entertainment venues and recreational facilities most affected, followed by small- and medium-sized business owners such as street stalls, flea and fresh market vendors and restaurants outside of shopping malls. Large businesses, such as shopping malls, in general were less impacted than smaller businesses. In any case, businesses nearby the factory mentioned in the news, regardless of size, were most heavily affected by changes in travel behaviour, while businesses in office districts were less so as most residents continued to maintain their normal travel behaviour for work.

Health preventative measures: In terms of measures taken to guard against Covid-19, the majority of respondents from Samut Sakhon used surgical masks (88.5%) and hand washing using alcohol gel (92.3%). In terms of cloth face coverings and hand washing

using soap ranked lower in popularity as a preventive measure, at 69.2% of all respondents.

Following the news reports, use of all preventive measures increased, with use of surgical masks being the highest, followed equally by hand washing using soap or alcohol gel and last by use of cloth masks. The increased use of preventative measures reflects public concern about the outbreak and more stringent compliance with safety measures such as wearing face masks.

The changes in behaviour to guard against infection also resulted in higher spending, such as in the increased use of surgical masks, which are usable only once compared with less-expensive and multi-use cloth masks. Regardless, while the news reports did lead to behavioural changes in terms of preventive measures, the research team assesses the overall impact as relatively limited.

With regards to the possible impact of delayed medical visits by Samut Sakhon residents, half of respondents said they did not have appointments scheduled during the time period of the news in question. Of those who did, 62% postponed their appointments, 15.4% maintained their scheduled appointments and 8% shifted to medical facilities in other areas. Of the respondents, 76.9% reported no chronic illnesses. Overall, there is deemed to be little long-term impact on health.

A majority at 69.2% of respondents said they did not seek Covid-19 tests following the circulation of the news, a much lower response then in the case of Chiang Rai. The research team judges that the news has had only a slight to medium impact on public health.

(3) Samut Sakhon business operators

Businesses were affected from changes in consumption behaviour of both visitors to and residents of Samut Sakhon. Under the logic model, four assumptions were made:

1. Residents in Samut Sakhon reduced consumption of goods directly related to the news outbreak, namely fresh and processed seafood, affecting revenues, employment, household income and the provincial economy.

2. Residents from other provinces would cancel travel to the area, whether for leisure or other purposes, resulting in lower consumption, business revenues and employment and negatively affecting the provincial economy.

3. Residents of Samut Sakhon would reduce travel outside of their homes, affecting consumption, business revenues employment and the provincial economy.

4. Residents of Samut Sakhon would shift spending to online retailers, helping boost revenues for online vendors and delivery services, positively affecting the local economy.

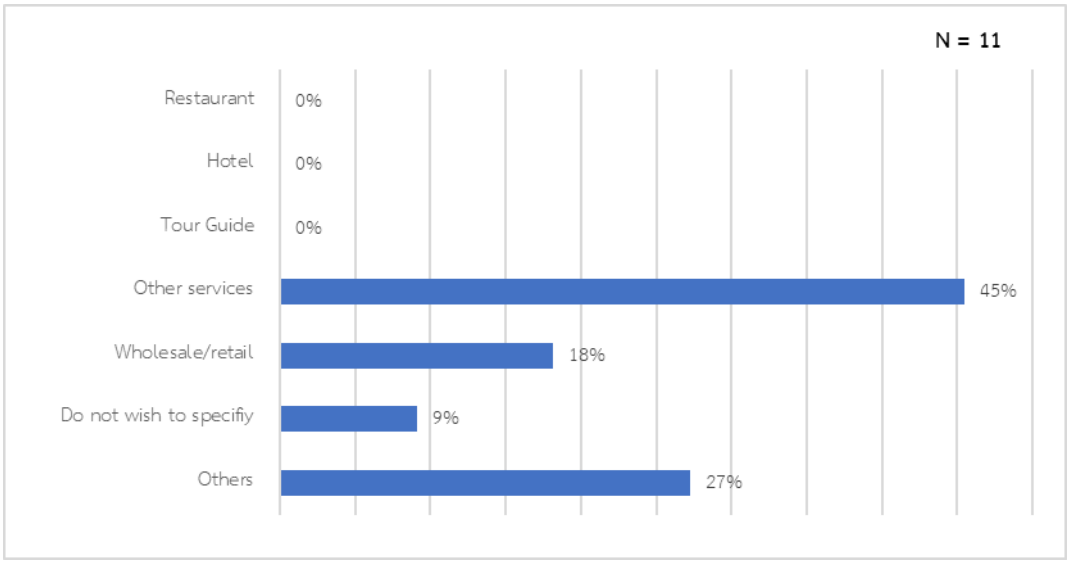
i. Impacts on business revenues as a whole

Of the eleven business owners participating in the study[25], five (45%) were service businesses, two (18%) were retailers and three in other industries such as chemicals or manufacturing. One participant declined to be identified. (See Figure 58)

Of the participants, 91% (10 responses) said they were not located near the seafood factory mentioned in the news story under study. Similarly, 91% (10 responses) said they remained in operation, with one respondent declining to answer.

In terms of revenues, two said their monthly revenues ranged from two to three million baht. Three out of the 11 businesses said they employed on average 48 Thais, with responses ranging from 10 to 120 people. Two businesses said they employed foreign workers, averaging 22 per business with responses ranging from four to 40 people.

Figure 58: Types of business operators in Samut Sakhon (percent)



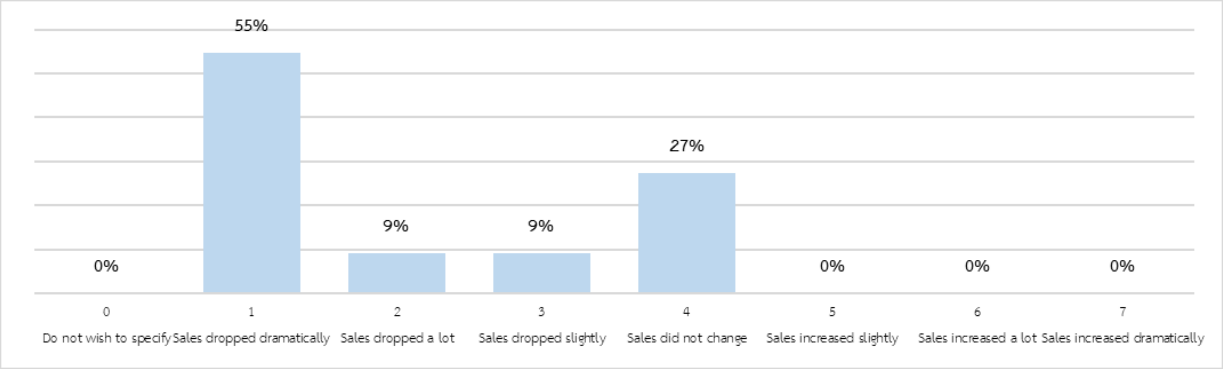
Source: Sal Forest

Respondents were asked to answer on a scale of one to seven the impact of the news on business revenues, with an answer of one meaning a significant decline in revenues or customers; four meaning little to no change; and seven indicating a significant increase in revenues or customers.

Of the 11 respondents, the average answer was 2.09, indicating a significant negative impact on revenues or customers with the range of answers from one to four. A total of 55% (six respondents) indicated a significant impact with a score of one; 27% (three respondents) answered a score of four, indicating little to no change; 9% (one respondent) answered a score of two; and 9% (one respondent) answered a score of three. (see Figure 59)

[25] Due to a small sample size, the analysis may be inaccurate.

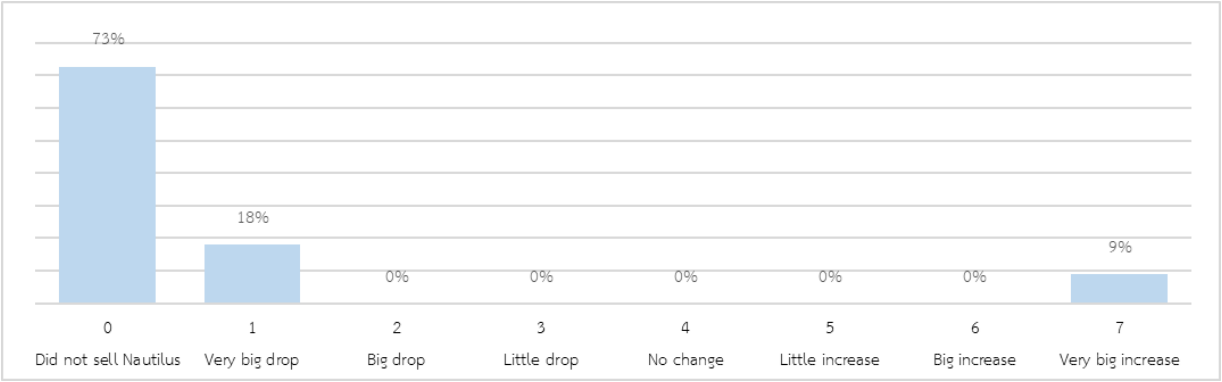
Figure 59: Scores for changes to sales/customers during the misinformation (percent)



Source: Sal Forest

The news story also had an impact on retailers selling products from the factory mentioned in the news: 73% (eight respondents) saying they did not sell these products; 18% (two respondents) said sales were heavily affected; 9% (one respondent) said sales increased significantly. [see Figure 60]

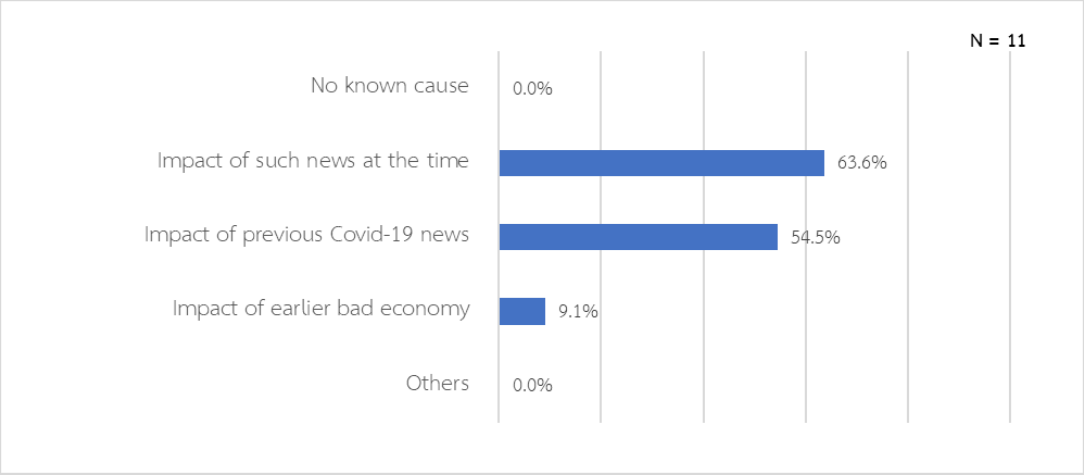
Figure 60: Scores for changes to sales of Nautilus products (percent)



Source: Sal Forest

On the reasons why sales were negatively affected, 63.6% of respondents said it was a result of the news; 54.5% said due to the Covid-19 pandemic in general; 9.1% said due to the overall economy. [See Figure 61]

Figure 61: Causes of drop in sales and customers during the misinformation (percent)



Source: Sal Forest

Of the group, four respondents or 36% did sell goods online. Of this sub-group, half offered their own delivery service, one sold through an online marketplace and one through offline resellers. Two of the group said online sales accounted for 21% to 40% of total revenues. The group overall assigned an average score of 3.25 in terms of business impact, with only a little impact on online sales during the time the news circulated. Of the four respondents, three (75%) answered a score of four, indicating no change in sales, while one respondent answered a score of one, indicating a significant decline in revenues.

In terms of responses to the decline in revenues, 55% of the respondents changed work conditions, including furloughing staff, reducing work hours and reducing salaries. Two companies said they ceased employing foreign workers.

(4) Medical personnel outside of Samut Sakhon

Out of five respondents[26], two (40%) said they dealt directly with Covid-19 patients. Based on the responses, the research team assessed the impact on the health system as follows;

i Impacts on Covid-19 screening service

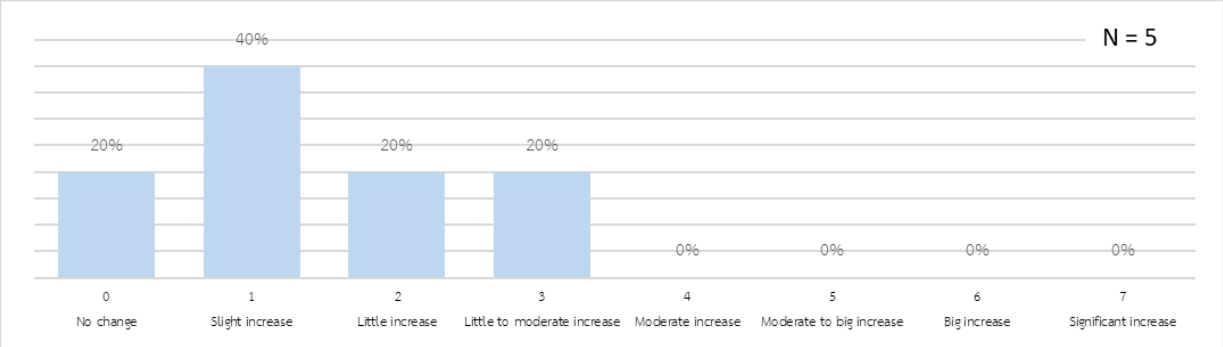
The impact on Covid-19 testing can be assessed by measuring whether there was a significant increase test requests from those travelling to Samut Sakhon. Respondents were asked to offer an assessment ranging from a score of zero, indicating no change in test requests to a score of seven, indicating a significant increase in test requests. The impact of higher test requests on the health system is based on the assumption that higher demand could affect the capacity of medical professionals and equipment.

Responses averaged a score of 1.4, with answers ranging from a score of zero to three, indicating that the number of test requests from those who had travelled to Samut Sakhon

[26] Due to a small sample size, the analysis may be inaccurate.

had only a minor to moderate increase overall. Of the responses, 40% (two answers) gave a score of one, indicating only a little increase in patients, with the remaining responses offering scores of zero, two and three. (see Figure 62)

Figure 62: Scores for changes in the number of people travelling to Samut Sakhon and seeking Covid-19 tests in hospitals outside Chiang Rai (percent)



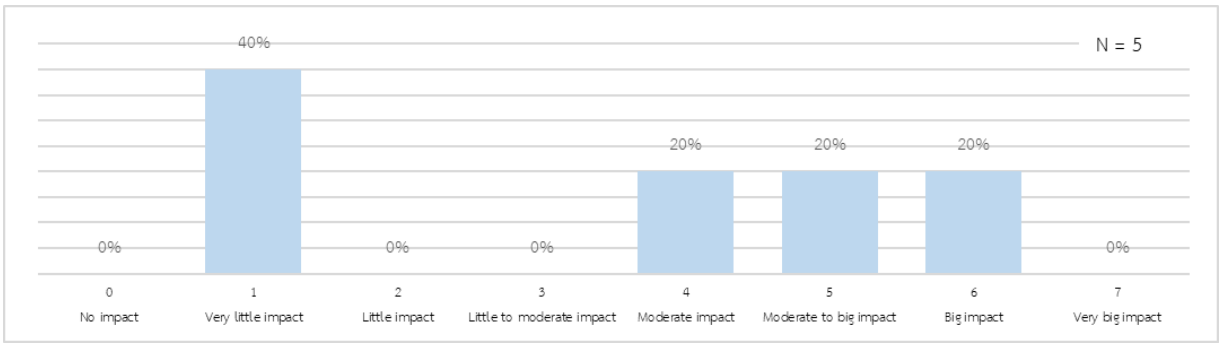
Source: Sal Forest

ii Impacts on the work of medical personnel

Respondents were asked to assess the impact of the news on their work, with a score of zero indicating no impact and seven indicating a significant impact.

The average score was 3.4, indicating only a slight to moderate impact on work, with 40% giving a score of one, indicating only a slight impact and the remaining responses ranging from a moderate to significant impact. (see Figure 63). In terms of obstacles encountered, 60% said hospital management systems did not comprehensively support patient needs; 20% indicated insufficient medical personnel; and 20% said there was no significant impact on work.

Figure 63: Score given to the impact of misinformation on medical personnel outside Samut Sakhon (percent)



Source: Sal Forest

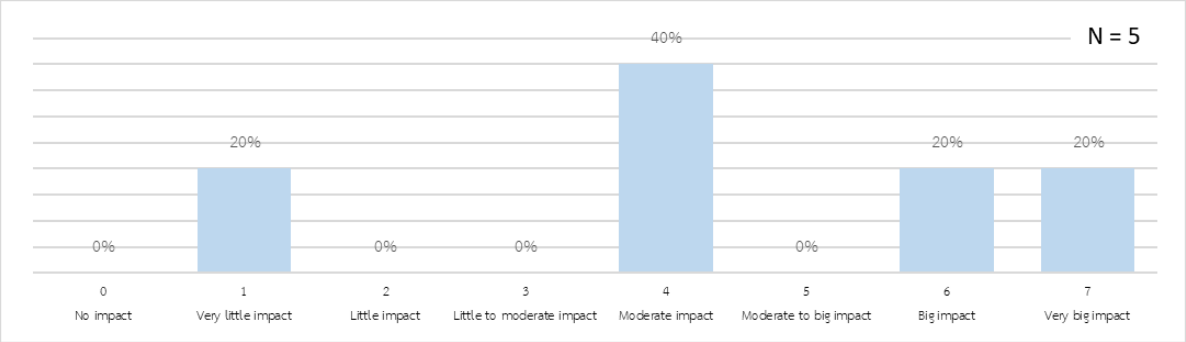
iii Impacts on general patient care services

Respondents were asked to assess the impact on general patient care services, with an answer of zero indicating no impact from the news and a score of seven indicating that the news had a significant impact on general patients.

The average score was 4.4, indicating that the respondents saw that the news had a moderate impact on general patients. Of the group, 40% viewed a moderate impact on patients, 40% indicated a high to very high impact and 20% only a slight impact. (see Figure 64)

The impact on patients was primarily seen in delayed appointments and visits (60%) and resource constraints (40%).

Figure 64: Scores given to the impact of false claims on the care of general patients during the misinformation (percent)



Source: Sal Forest

The perspective of medical personnel on the impact of the news on the health system was that as the number of patients seeking Covid-19 tests did not significantly increase, the overall impact of the news was slight. In terms of resources, there may be insufficient staff to provide services. As a result, when considering three systems – Covid-19 testing, medical personnel and general patient care – the impact is highest on non-emergency general patient care, as medical appointments were delayed or rescheduled.

(5) Medical personnel in Samut Sakhon

Of four respondents, 75% (three respondents) worked in functions directly related to Covid-19.[27] The research team assessed the impact on the health system as follows:

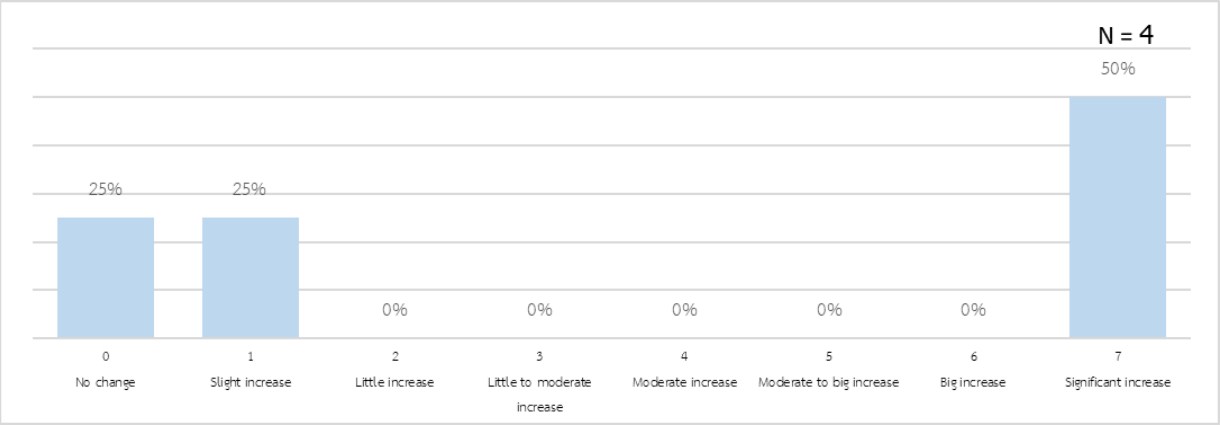
i Impacts on Covid-19 screening service

The impact on Covid-19 testing can be assessed by measuring whether there was a significant increase test requests at hospitals in Samut Sakhon. Respondents were asked to offer an assessment ranging from a score of zero, indicating no change in the number of test requests and a score of seven indicating a significant increase in the number of test requests. The impact of higher test requests on the health system is based on the assumption that higher demand could affect the capacity of medical professionals and equipment.

[27] Due to a small sample size, the analysis may be inaccurate.

The average score from the respondents was 3.75, indicating a slight to moderate increase in test requests for Covid-19 from the news. Half of the group (two responses) indicated a significant increase in the number of test requests, while the other two responses indicated no to slight increase. (see Figure 65)

Figure 65: Scores given to the change in the number of people seeking Covid-19 tests at hospitals in Samut Sakhon (percent)



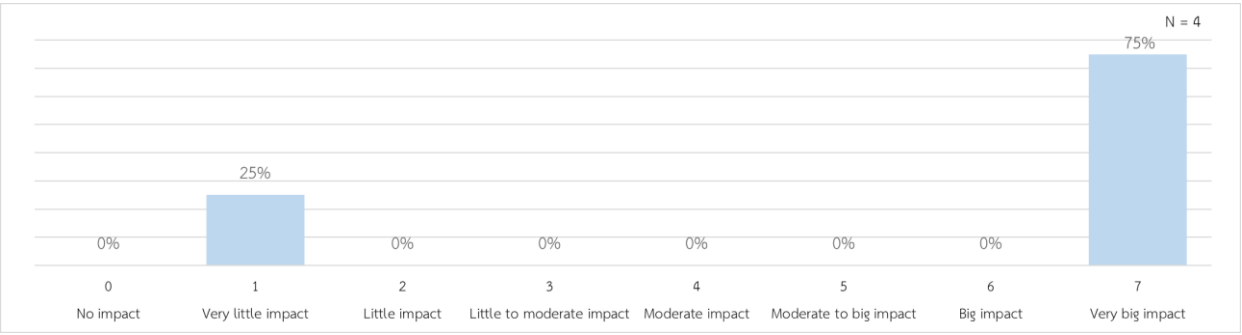
Source: Sal Forest

ii Impacts on the work of medical personnel

Respondents were asked to assess the impact of the news on their work, with a score of zero indicating no impact and seven indicating a significant impact.

Respondents indicated that the impact on the work of medical personnel from the news was moderate to high, with an average score of 5.5. Three-quarters responded a very high impact on work overall, while 25% responded that the impact was only slight. (see Figure 66). All respondents in the group said that lack of medical supplies and equipment was the main obstacle, 50% indicated that hospital management systems did not comprehensively supporting patient needs and 25% said medical personnel were insufficient.

Figure 66: Scores given to the impact of misinformation on medical personnel in Samut Sakhon (percent)



Source: Sal Forest

iii Impacts on general patient care services

Respondents were asked to assess the impact on general patient care services, with an answer of zero indicating no impact from the news and a score of seven indicating that the news had a significant impact on general patients.

Respondents within the group said the news had a significant impact on general patients, with all answering a score of seven. In terms of impact, 75% of the group said non-critical appointments were delayed while 50% responded that medical personnel were insufficient.

The capacity of the health system in providing Covid-19 testing services and the work of healthcare professionals overall was affected moderately to high by the news as the number of test requests increased at a time equipment, supplies and staff was shorthanded. General patients were also highly affected as non-emergency appointments were postponed.

However, as the number of medical personnel in the area who participated in the study was small and not all respondents were directly involved in dealing with the COVID-19 pandemic, the results of this analysis may be inaccurate.

3.2.3 Summary of the social impact of the Covid-19-related news in Samut Sakhon

Based on the logic model, the research team could draw seven impact routes. Details are as followed.

1. Assumption: Impact on the capacity and resources of the public health system in Samut Sakhon

The public health resources and capacity could be compromised because more people could seek Covid-19 tests. The survey on sample groups in Samut Sakhon indicated that a majority of them did not seek Covid-19 tests when the news was publicised, with the ratio of those who sought the test and those who did not do so at 30/70. (In the case of Chiang Rai, the ratio was 10/90).

Finding: From the point of view of medical personnel in Samut Sakhon, there was an increase of people seeing Covid-19 tests while the impact on medical workers in the province was estimated to be moderate to significant. The causes are inadequate medical resources including equipment and personnel. As for the public health system in other provinces, the impact was estimated to be small both in areas concerning Covid-19 directly and other medical resources.

2. Assumption: Impact on the health of Samut Sakhon residents

Behavioural changes including a tendency to avoid visiting the hospital could result in patients not receiving medical treatment in time or the cost of treatment become higher.

Finding: Responses by people who resided in Samut Sakhon showed a moderate drop in visits to hospitals. However, most people still avoid seeing doctors according to appointment (60%) while another 15% chose to see doctors in areas further away from the factory in the news.

Since most respondents from the sample group who resided in Samut Sakhon did not have underlying diseases that required regular treatment, the delay in seeing doctors or receiving treatment should not produce a lot of effect on the health of people in the province.

However, medical personnel in Samut Sakhon gave a conflicting opinion indicating that non-Covid-19 patients who did not need urgent treatment received significant impact from the fact that hospitals had to postpone their appointments and inadequate services because the resources had been stretched. Still, since the sample group who are medical personnel was small, the result remains inconclusive.

3. Assumption: Impact on business operators in Samut Sakhon

This could result from people refrain from buying products related to the outbreak including products from the factory in the news, fresh as well as processed seafood from other sources.

Finding: The survey found a slight drop in people's spending on fresh or processed seafood from other sources while that on processed seafood produced by the factory in the news dropped moderately. The impact on fresh and processed seafood operators was thus estimated as small.

The finding corresponds to information from sellers of the product made by the factory in the news as two out of three said sales of the product dropped down significantly while the other one said the sales actually increased. However, since the sample size of this group was small, the result could be inconclusive.

4. Assumption: Impact on business operators in Samut Sakhon

If people outside of the province cancelled their business or recreational trips, the province's economy especially the tourism segment could suffer.

Finding: The survey of opinions of people outside Samut Sakhon showed that most of them only passed through the province. The research team thus estimated the damage caused by cancellations of trips into the province based on tourism-related data at a maximum of 710,538.5 baht though the news cycle which was about one week. The estimate, however, was subject to various limitations including the different goals in travelling and the fact that no data were available on the number of visitors in January 2021 when the news emerged. The estimate, therefore, may be cited with caution.

Impacts on other groups be they tourists, workers, people who wished to visit their relatives or passing through the province varied. These included losing hotel deposits, failure to spend time with families and inability to care for them. These groups did not specify damage in a concrete or financial term.

Business operators in the province indicated that their sales dropped significantly during the news. Half of them adjusted by terminating their staff, reducing wages or working hours. The reduction applied to both Thai and migrant workers. The business operators said that the drop in sales was mostly caused by the news, followed by the Covid-19 outbreaks.

5. Assumption: Impact on business operators and people in Samut Sakhon

The change in behaviour could result in people avoiding to travel and spend their money locally.

Finding: Survey respondents who resided in Samut Sakhon said their spending had dropped by 34-67% during the news cycle. Compared to data on people's spending by province from the National Statistical Bureau, the research team estimated that the drop in spending was from 754.7-1487.2 million baht during the week when the misleading news proliferated. The segments that were most affected are services and luxury goods while other groups saw a small to moderate drop. The sales of alcohol, beer and cigarettes did not correspond to the drop in visits to entertainment venues, which was found to be significant. Fresh and processed seafood that came from other sources received less impact from those from the factory in the news.

Apart from entertainment business, recreational venues and businesses located near the factory in the news were most affected. Impacts on other businesses, whether they are small, medium or large, exist as shops, food stalls, located in weekend markets, fresh markets or malls, were similar. Still, those located close to offices could be less affected because people in Samut Sakhon were found to still spend on products there or prefer to visit these areas.

6. Assumption: Impact on business operators and people in Samut Sakhon

The change in behaviour could result in people spending more for online services or deliveries.

Finding: Respondents who are Samut Sakhon residents indicated that most of them resorted more on online payment than cash, but the switch was still less than the case of Chiang Rai.

This could be because only 36% of businesses in Samut Sakhon offered online services. Sales through online platforms accounted to 21-40% of the total volume. At the time when the misleading emerged, most business operators said they saw only a small or no change at all to their online sales.

7. Assumption: Impact on business operators

This could result from people both in and outside the province avoiding to visit areas around the factory in the news or near communities of migrant workers.

Finding: According to the survey results, people in Samut Sakhon indicated that they highly avoided the mentioned areas, at the same level with entertainment and recreational venues. About one third of people outside Samut Sakhon said they avoided the areas. Based on the information, it is assumed that impacts on businesses in the areas were high.

Chapter 4: Summary and recommendations

The assessment of economic and social impacts of the case studies on misinformation in Chiang Rai and Samut Sakhon can be summarised as followed:

1. News that provoke panic, whether it is true or false, can cause people to change their behaviour. When a large number of people who received certain information changed their behaviour, it sends an impact onto the economy and society. The impact chain will be similar, as seen in the cases studies in Chiang Rai and Samut Sakhon. In other words, as long as people who received the information believe that it is true (whether or not it is true), they will react to the information in the same and predictable way.

2. The research team considered the economic impact of the false claims in Chiang Rai and misleading news in Samut Sakhon as consisting of a drop in spending by people in the province and lost spending by visitors some of whom decided to cancel their trips. On the drop in local spending, the research team estimated the damage during the one week when the news proliferated to be 367-724 million baht at a maximum in the case of Chiang Rai and 754-1,487 million baht at a maximum in the case of Samut Sakhon. As for the impact from trip cancellations, the research team estimated the lost spending to be worth 28 million baht at a maximum in the case of Chiang Rai and 700,000 baht at a maximum in the case of Samut Sakhon.

3. In terms of impact on the public health system, the research team found that the misinformation in both case studies did not produce that much effect. Only 12% of respondents in Chiang Rai and 30% in Samut Sakhon said they decided to take Covid-19 tests after learning about the news. Also, medical personnel in both provinces indicated that the public health systems had suffered from inadequate medical resources before the news emerged. While the misinformation spread, the number of residents in the provinces and people who returned from both provinces and sought Covid-19 tests elsewhere did not increase significantly. The main impact in this area should be on general patients whose appointments were delayed by hospitals. However, the research team did not have enough data from the survey to come up with a proper analysis.

4. It was almost impossible to differentiate the impact caused by the particular news stories featured in the case studies and that caused by other factors such as other news stories or government measures that occurred during the same period. News stories do not occur in a vacuum or in a state where there are no other messages or information. News always occur amid a variety of factors and other pieces of information. Often, it is difficult to pinpoint whether a change in people's behaviour was caused by the "fake news" or true stories. The case in point is the Chiang Rai case study. Representatives from the hotel association viewed that the true stories about people infected with Covid-19 who sneaked into the country from Myanmar had already caused hotel bookings to dive. The ensuing "fake news" about Chiang Rai going into a lockdown simply pushed it further down. But it was almost impossible to differentiate what particular impact was caused by each of the two news stories since both of them were directly related and occurred on the heels of each other.

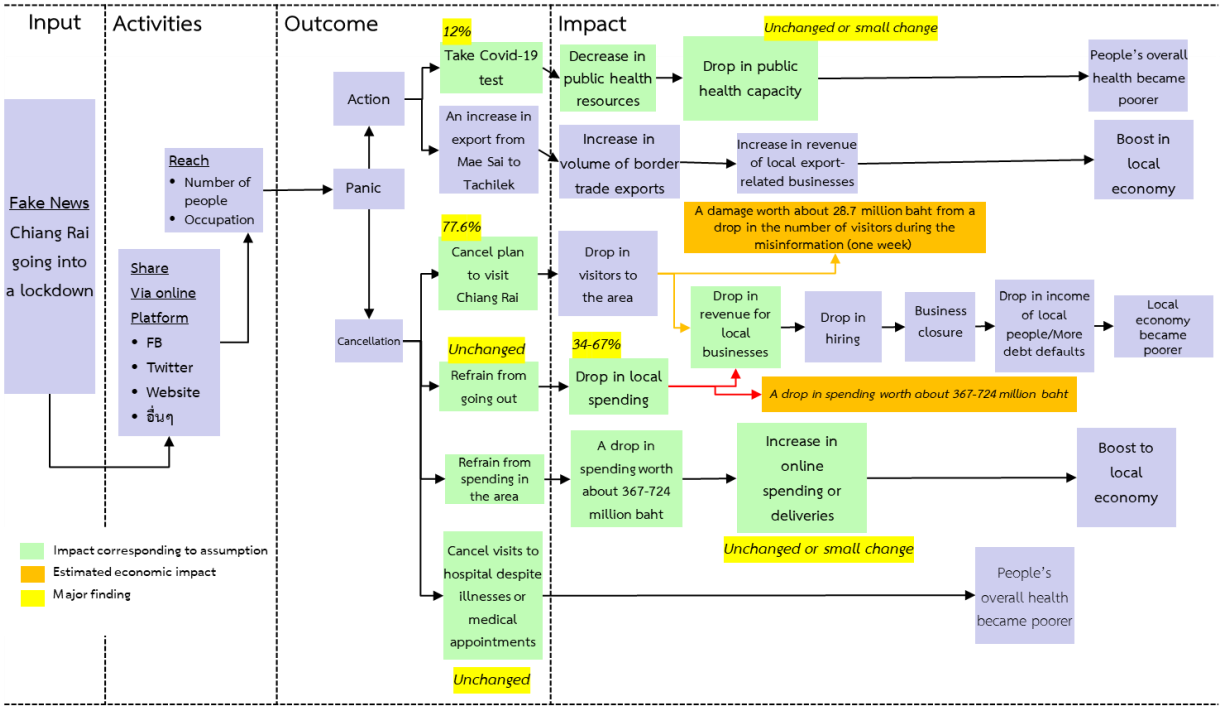
5. It is possible that the economic and social impact of Covid-19-related "fake news" would diminish both in terms of variety and size as time passes. This is because business operators and the general public had learned to adapt themselves after the first wave of

Covid-19 struck in early 2020 before they came up on the misinformation in the case studies. In a way, they have become accustomed to the outbreaks. For example, in the case of the misleading news in Samut Sakhon, the research team found that half of the business operators adapted themselves to the situation by terminating staff, reducing wages or working hours of both Thai and migrant workers since the outbreaks began which was before the news stories in the case studies occurred.

The results of the assessment of the economic and social impact in both case studies are summarised in Figure 67 and 68. The green boxes show the results from the survey that corresponds to the assumption used in the logic model. The italics show the main findings on the topics based on the survey and the orange boxes show the estimated economic impact based on the survey results together with data from the National Statistical Bureau.

For further research about “fake news”, the research team recommended that a survey of opinion or interview of news recipients should be conducted as soon as the “fake news” occurred. This is because “fake news” has a very limited life cycle, usually counted in days, before clarifications are made. Therefore, its impact cannot be easily identified from influences of other factors as indicated in the two case studies.

Figure 67: Results of the economic and social impact assessment from the false claims in Chiang Rai



Source: Sal Forest

Figure 68: Results of the economic and social impact assessment from the misleading news in Samut Sakhon