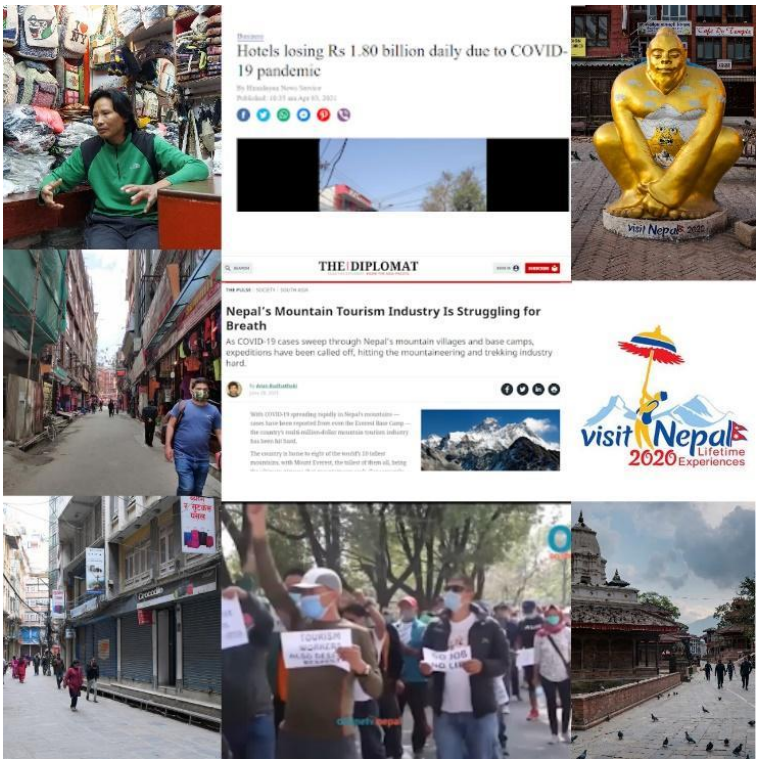


FINAL REPORT

Cities' COVID Mitigation and Mapping (C2M2)
Kathmandu

Kathmandu Living Labs
1474 Lamtangin Marg,
Chundevi,Kathmandu,
Nepal

Acknowledgement

We, the entire team of Kathmandu Living Labs, express our sincere gratitude to the people and organizations who helped us at various steps throughout Cities' COVID Mitigation and Mapping (C2M2) Project.

We are extremely grateful to the entire team of C2M2 Global - Melinda Laituri, Kim Junghwan and Laura V Cline for their feedback and guidance throughout the project duration. Also, this project would not have been possible without the expert mentorship of the C2M2 Asia Hub Director, Dr. Nama Raj Budhathoki who provided his expert mentorship in shaping the project. Special regards to Sazal Sthapit, the former Senior Projects Manager and Arogya Koirala, the former Tech Lead of KLL for taking this project to new heights. Many thanks to Deepak Raj Joshi, former CEO of Nepal Tourism Board and presently the member of World Tourism Council. As an advisor to this project, he helped us navigate the tourism landscape and guided this project's course. We also thank the heads of several tourism associations and workers' unions for their support in designing the survey. We especially thank Tekendra Mahat (COO of HAN), Suman Parajuli (President of UNITRAV), Kapil Kafle (President of JOTTUF) and Bhabishwor Sharma (President of TTDC) for their support in reaching out to tourism businesses and workforce. We extend our gratitude to Hotel Association of Nepal (HAN), Joint Tourism Trade Union Forums (JOTTUF), Thamel Tourism Development Council (TTDC), and Union of Trekking Travels Rafting Workers Nepal (UNITRAV) for the major roles they played in designing and distributing the survey to tourism businesses and workforce. Our appreciation also goes to all the tourism entrepreneurs and workers who supported us, directly by participating in the study and indirectly by forwarding the study questionnaire and giving their valuable inputs in our efforts to expedite the Nepali tourism industry post COVID-19 pandemic. We want to mention our gratefulness to Vidya Shakya, Salil Shrestha, Saila dai, Ramesh Dhakal, Milan Kumar Tamang, Neetam Subedi, Gautam Raj Wagle and Sunita Bajracharya for taking out the time to share their experiences through the interview. Lastly, many thanks to all individual members of Kathmandu Living Labs for putting their hard work to reduce the negative impacts of COVID on the Nepali tourism industry.

We extend our heartfelt gratitude to everyone involved for the continuous support and encouragement in successfully completing the project activities during the challenging times.

Disclaimer

Executive Summary

The objective of the report is to consolidate the learnings, findings, and project activities conducted for C2M2 Kathmandu Hub. It starts with the discussion of the baseline report prepared in the early months of project implementation. It then elaborates on the project activities with reference to the updated causal loop diagram. The lessons learnt from conducting the project, recommendations, limitations and discussion on future directions are included in the final sections.

The first chapter of the report builds on the baseline report. The baseline report had conceived of three scenarios related to the revival of the tourism industry in Nepal. Given the prevalence of the second wave and subsequent lockdown in April, the arrival of international tourists was halted in the first half of 2021. This impacted the livelihood of tourism workers and businesses further, who were already struggling to recover from the impact due to travel restrictions and lockdown in the first wave.

The report then goes on to discuss the project activities that were conducted to fulfill the gap as assessed in the baseline report. Among the five areas of impact identified in the baseline, C2M2 Kathmandu team focused on addressing data gaps for tourism businesses and workers. This section also updates the causal loop diagram- incorporating data and insights derived from project activities. In particular, the updated diagram links jobs and mobility.

The third chapter elaborates on the lessons learnt during the project implementation. It presents five major lessons. First businesses and workers were severely impacted due to COVID-19. Second, savings depleted substantially for the businesses. Third, workers are highly vulnerable to the secondary impact. Fourth, psychological effects due to the pandemic are alarming. Fifth, businesses are concerned about the well-being of the workforce.

The fourth chapter report presents recommendations to mitigate the secondary impact of COVID-19 on tourism workers and businesses. There were five primary recommendations- (i) Reskill and upskill the workforce, (ii) Provide psychological support to the workforce, (iii) Provide holistic relief measures to the businesses, (iv) Vaccinate the tourism professionals with priority and (v) Create a conducive environment to ensure safety of visitors and ease entry protocols.

The final chapter includes discussion on limitations and future directions. Limitations were mostly caused because of the mobility restrictions due to COVID, which affected in-person meeting and survey deployment, data collection outside Kathmandu. The other major limitation was political instability in Nepal which caused difficulty in finding a partner for project portal handover. Conversations of initiating a task force with different tourism associations halted as the government in Nepal changed during the period. Moving forward, the C2M2 team plans to engage further with the tourism sector stakeholders to ensure the knowledge generated during the project is taken into consideration for decision-making and planning in the industry.

Table of Contents

Update and Comparative Analysis of Baseline Report

The baseline reports produced during the conception stage of the C2M2 Kathmandu project provided a holistic overview of the preliminary impact of COVID-19 in Nepal's tourism sector. The report also consolidated findings from existing studies and included opinions from experts and stakeholders. Of relevance are the three likely scenarios the report highlighted based on the studies from OECD (2020) and UNWTO (2020). The scenarios were:

- Scenario 1: International tourist arrivals start to recover in July, and strengthen progressively in the second half of the year
- Scenario 2: International tourist arrivals start to recover in September, and then strengthen progressively in the final quarter of the year
- Scenario 3: International tourist arrivals start to recover in December, based on limited recovery in international tourism before the end of the year

Scenario 1 was the most "optimistic" as it projected the international tourists' inflow to resume by mid-year. However, given the occurrence of a second wave of COVID-19 in late April, the government imposed a lockdown beginning 29 April, which halted national and international flights (Nepali Times, 2021).[1] This posed a severe blow to the burgeoning hope of tourism sector stakeholders, who had already dealt with more than a year of major lockdowns and shutdown of businesses.

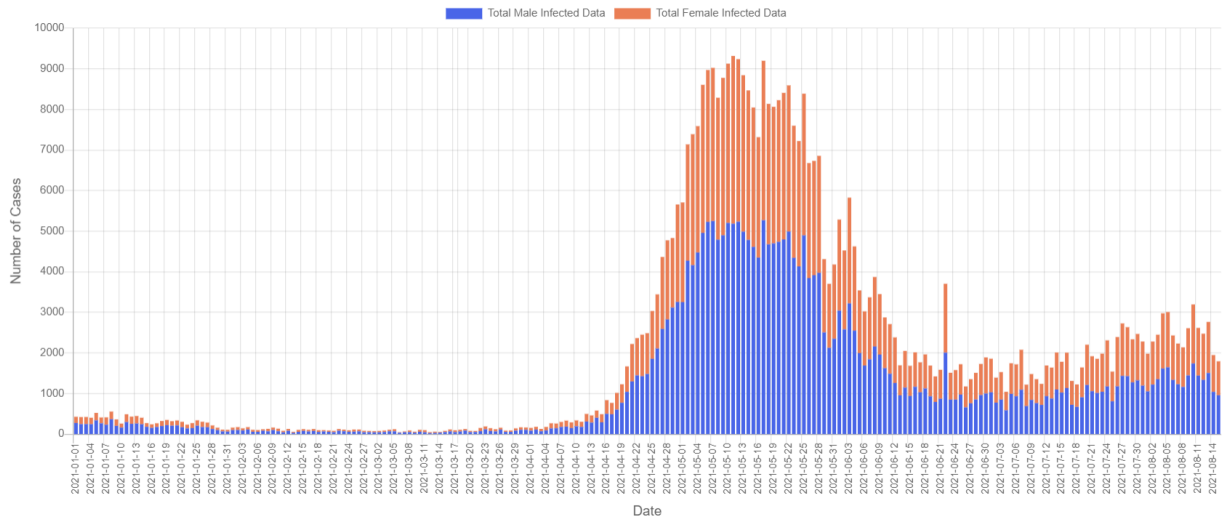


Figure 1: COVID-19 cases in Nepal between Jan 1, 2021 and Aug 15, 2021. Data: Ministry of Health and Population (MoHP), 2021.[2]

As shown in the figure above, the cases of COVID-19 spiked in late April and the trend continued till June. Towards late June, the number of cases started to decline. Even though the numbers were declining in this period, the infection rate remained high- especially in provinces with larger segments of the population. Bagmati Province, which houses Nepal's only international airport and is home to Thamel- the country's premier tourist destination, was the epicenter of the outbreak as the figure below suggests.

[1] Nepali Times, 2021. https://www.nepalitimes.com/latest/lockdown-may-be-extended-in-kathmandu/
[2] MoHP, 2021. https://covid19.mohp.gov.np/

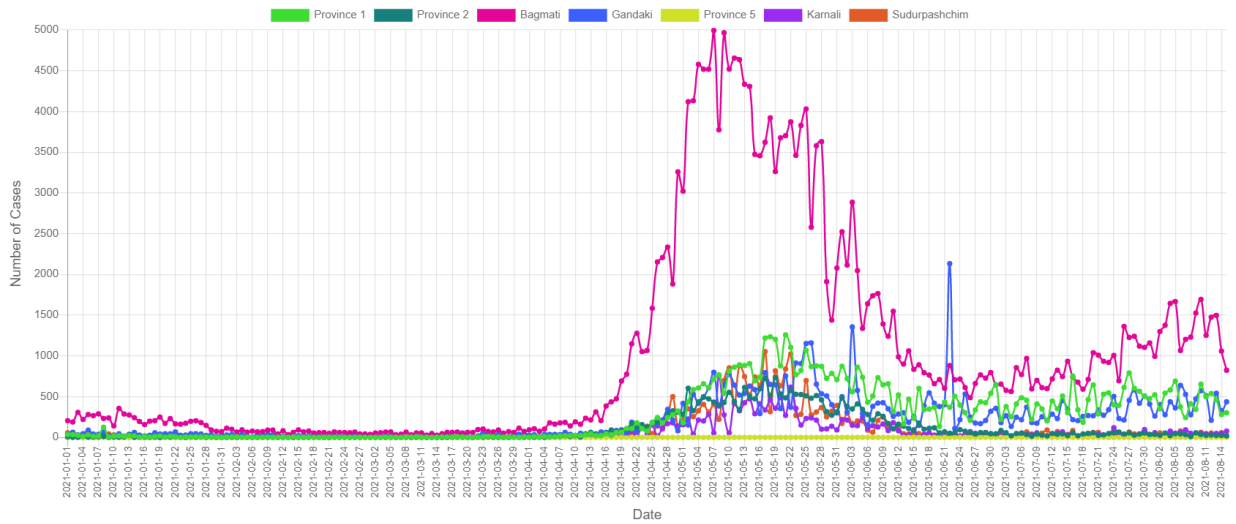


Figure 2: COVID-19 cases by Provinces. Data: Ministry of Health and Population, 2021.[3]

Impact on Livelihood

This unexpected spike in cases not only stretched Nepal's health resources beyond its limit but also foreshadowed the upcoming economic downturn in the tourism industry. During the informal conversations during the baseline assessment, many tourism sector entrepreneurs and workers mentioned that their livelihood would be severely impacted if Nepal was to go into a second lockdown. The urban informal workers were deemed to be particularly vulnerable to economic shocks. This fear materialized into reality as the COVID-19 cases spiked in mid-2021. Fulfilling necessities such as housing and food became a challenge for many in the tourism sector.[4] The survey conducted by KLL- as a part of C2M2 initiative- highlighted the impact, more on which will be elaborated in the next chapter.

Expectations from the Government

When the baseline report was published, many of tourism associations did not have an "amicable relationship" with the government. There was a wide gap between expectations of the association members from the government and the actions from the policymakers. In particular, the expectation pertained to the holistic support to the tourism sector in the form of subsidies and conducive policies to withstand the socio-economic shocks of COVID-19. Although the government had introduced some policies, the associations deemed the implementation weak and the governmental measures less than effective.

[3] Ibid.

[4] Nepali Times. 2021. https://www.nepalitimes.com/banner/the-real-cost-of-nepals-second-wave/

This tension among tourism entrepreneurs and workers on one hand and the government of Nepal on the other hand continued well into the 2021. The rift between the associations and the government has continued. However, in recent days the introduction of loan subsidies and relevant supporting policy measures from the government has provided some respite to the association members. Still, in many cases, the association members have continued to lobby for measures- sometimes independently- to withstand the secondary impact of COVID-19. For instance, earlier in the year the Thamel Tourism Development Council (TTDC) - a major tourism association in Nepal- successfully bargained for 50% reduction in the rent of businesses located in Thamel- the heart of international tourism in Nepal.

Later in the year, TTDC- in coordination with other associations- lobbied with the government to prioritize vaccination for the tourism entrepreneurs and workers in Thamel. This was a significant achievement for the tourism industry to recover and start providing services to travelers. Informal conversations with stakeholders from tourism associations suggest that they are in extensive conversations with the current government to introduce further measures to help the industry recover.

In addition to the topics discussed above, the baseline also highlighted the data gaps in the tourism sector. The next chapter elaborates the findings of the C2M2 Kathmandu survey- that was conducted to address the data gaps.

Assessment of the Project

The baseline report identified major data gaps pertaining to COVID-19 impact on Nepal's tourism sector. These gaps were identified from exhaustive factor mapping exercise, which is available in the baseline report. The areas of impact, where the gap existed, were as follows:

1. Tourism Businesses
2. Tourism Workforce
3. Investment within the Tourism Industry
4. Governmental Policies
5. Nepal's Image as a Tourist Destination

The C2M2 Kathmandu focused on addressing the data gaps in the first two areas as understanding the impact on individuals and businesses would provide a ground-level perspective of COVID-19 impact. This section elaborates on the activities carried out to address the data gaps. It first discusses the causal loop diagram, which provided the conceptual framework for designing the survey. It, then, elaborates on the learnings- in the form of analysis and visualizations.

The baseline report projected that it was "highly unlikely that international tourism will recover any time before fall 2021". Heading into late 2021, this project stands largely valid as travel restrictions for international visitors are still in place. Recent conversations with experts and stakeholders from the tourism sector suggest that the sector is pivoting to domestic tourists to fulfill the gap in demand. Mr. Deepak Joshi, former CEO of Nepal Tourism Board- a government agency that oversees and coordinates major tourism activities in the country- mentioned that majority of the hotels and resorts around Kathmandu Valley are operating in full capacity during the weekend- despite the ongoing COVID-19 restrictions in the country.

This surge in tourism activities is not a coincidence though as the tourism businesses have made a concentrated effort in targeting domestic tourists. Experts and observers[5] have been vocal about the need to promote domestic tourism.[6] Although there are no formal studies or sources, anecdotal evidence such as advertisements in social media platforms and informal conversations, substantiate this line of thinking that the tourism sector would be able to withstand some of the secondary COVID-19 shock by pivoting to domestic tourism.

The update in causal loop diagram is made taking into account these recent developments, along with the insights obtained from the larger survey that C2M2 Kathmandu team conducted in 2021.

[5] The Himalayan Times (2021). https://thehimalayantimes.com/blogs/covids-impact-on-tourism

[6] Khanal (2021). https://blogs.worldbank.org/endpovertyinsouthasia/will-covid-19-survival-strategy-permanently-change-nepals-tourism-industry

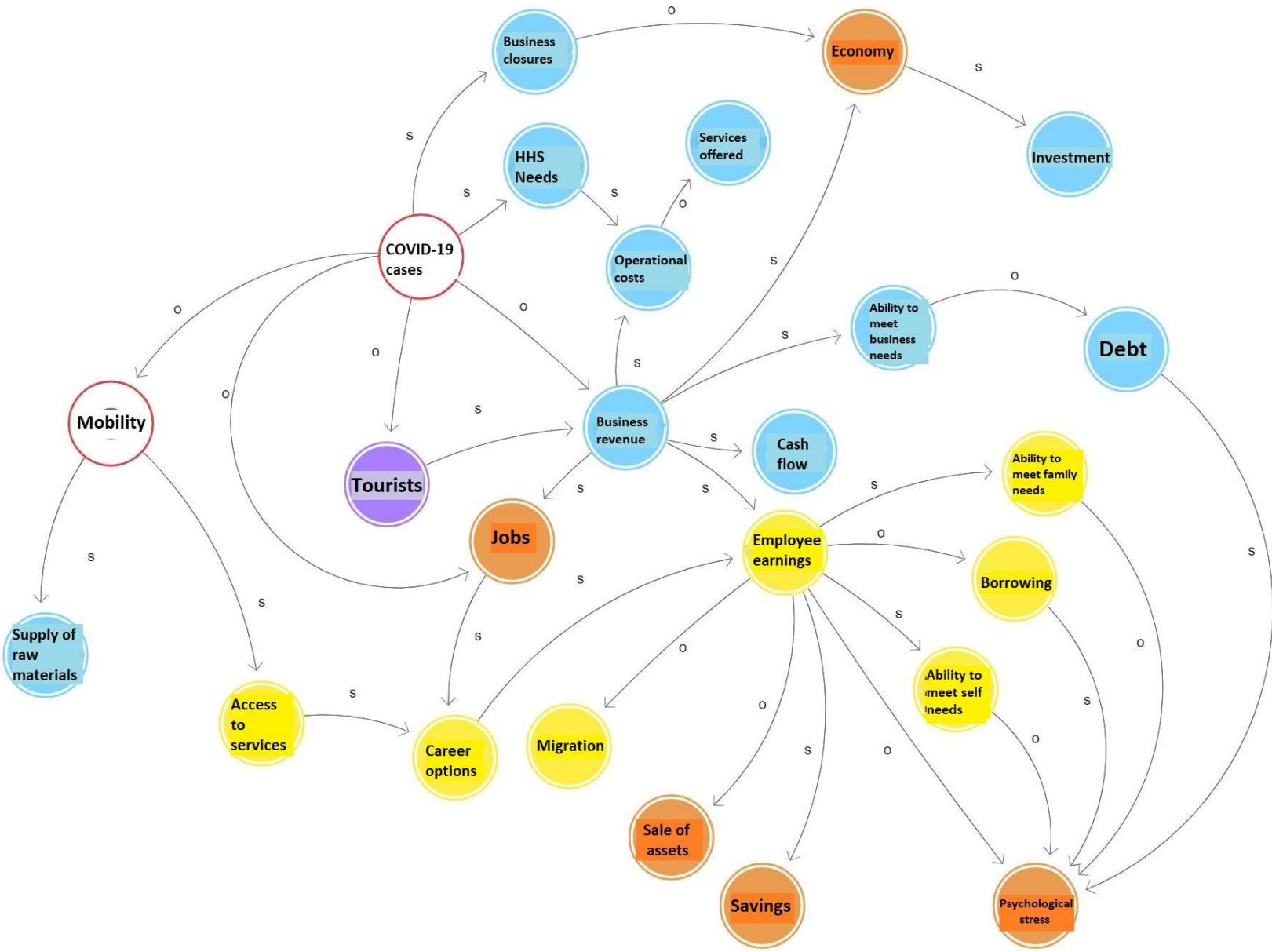

Business closures
Economy
Investment
HHS Needs
Services offered
Operational costs
COVID-19 cases
Ability to meet business needs
Debt
Mobility
Business revenue
Cash flow
Tourists
Ability to meet family needs
Jobs
Employee earnings
Borrowing
Supply of raw materials
Ability to meet self needs
Access to services
Career options
Migration
Sale of assets
Savings
Psychological stress

Figure 3: Updated Causal Loop Diagram (for full diagram, click here)
S- Same direction
O- Opposite direction

In the previous causal loop diagram, mobility was assumed to be linked with supply of raw materials and access to services. Access to services, by extension, was linked with career options. However, in the updated diagram, access to the raw materials bubble has been eliminated- as the research did not explore the relationship between this variable and mobility. This could have been due to the limitation of the C2M2 survey though.

Similarly, incorporating the findings of the survey, the updated causal loop diagram links jobs and mobility. The survey found that a significant majority of the workers and businesses had lost their livelihood and migrated- either temporarily or permanently due to loss of jobs. Thus, there was a positive correlation between loss of jobs and mobility, which is indicated in the causal loop diagram. As domestic tourism is booming in recent months and the tourism businesses are slowly resuming their operations, mobility of the workers has increased to tourist destinations, which further substantiates the rationale.

The other relationships assumed in the initial causal diagram still hold- based on recent findings and the C2M2 survey results. The findings and results are explained in detail in the next section.

Lessons Learnt

The C2M2 survey aimed to understand four major areas pertaining to the secondary impact of COVID-19 in the tourism sector. These areas were:

- Impact: How did COVID-19 impact tourism businesses and workers?
- Resilience: How did the businesses and workers respond to the impact?
- Needs: What were the needs of the businesses and workers?
- Outlook: What does the trend of outlook look like for the tourism businesses and workers?

In order to have a nuanced understanding of these areas, the survey reached out to stakeholders extensively to solicit representative responses. While the method does not claim to be a representative one- due to the constraints of COVID-19 lockdown and resources available, the 200+ responses from workers and 100+ responses from the tourism businesses was encouraging and allowed the team to get an insight into the areas mentioned above.

Visualizations of Results

The following data products help us visualize the summary of the responses. Details of these visualizations are available in our [web portal](#).

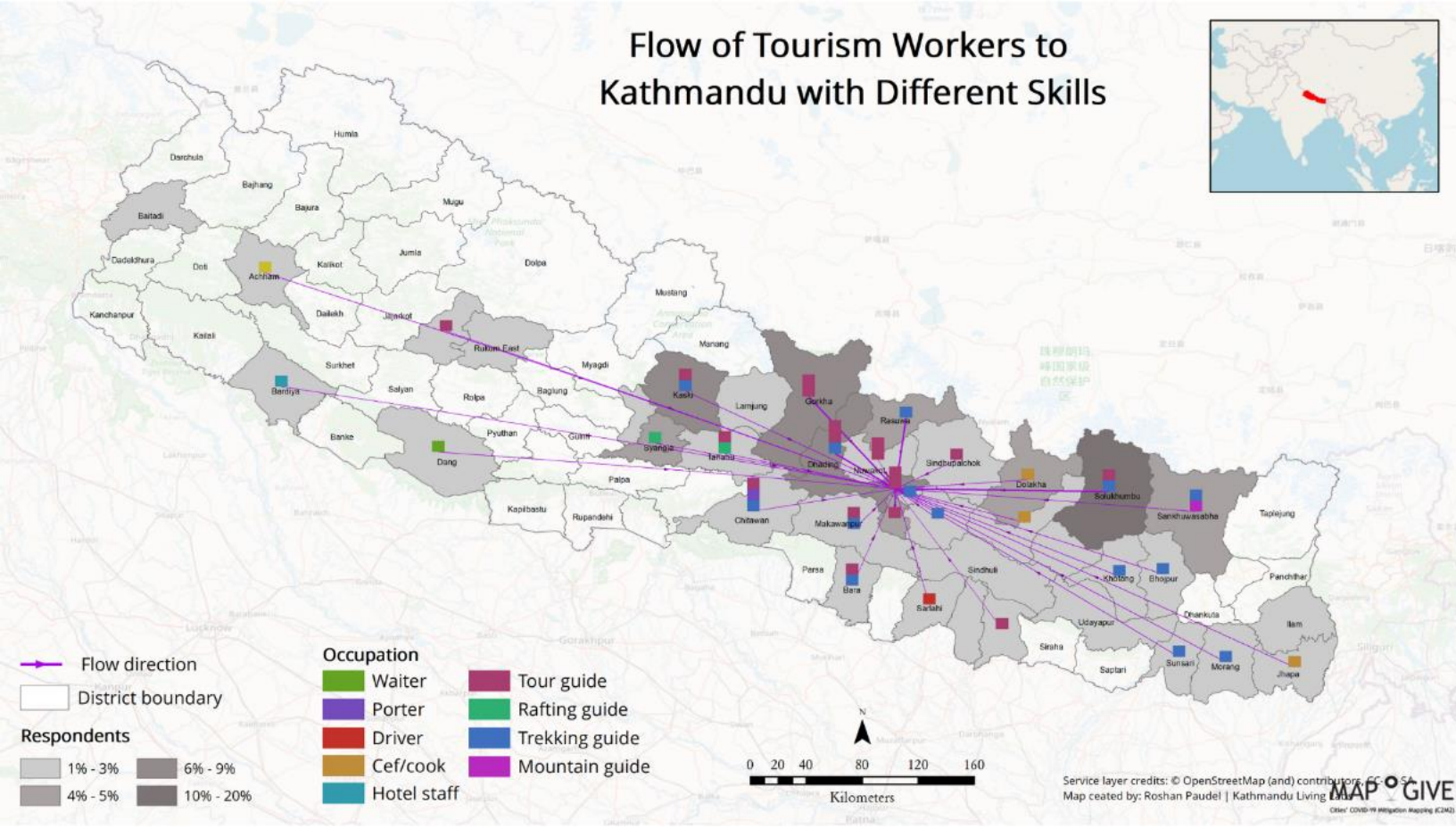


Fig 4: The flow of tourism workers from different districts to Kathmandu and their different skills

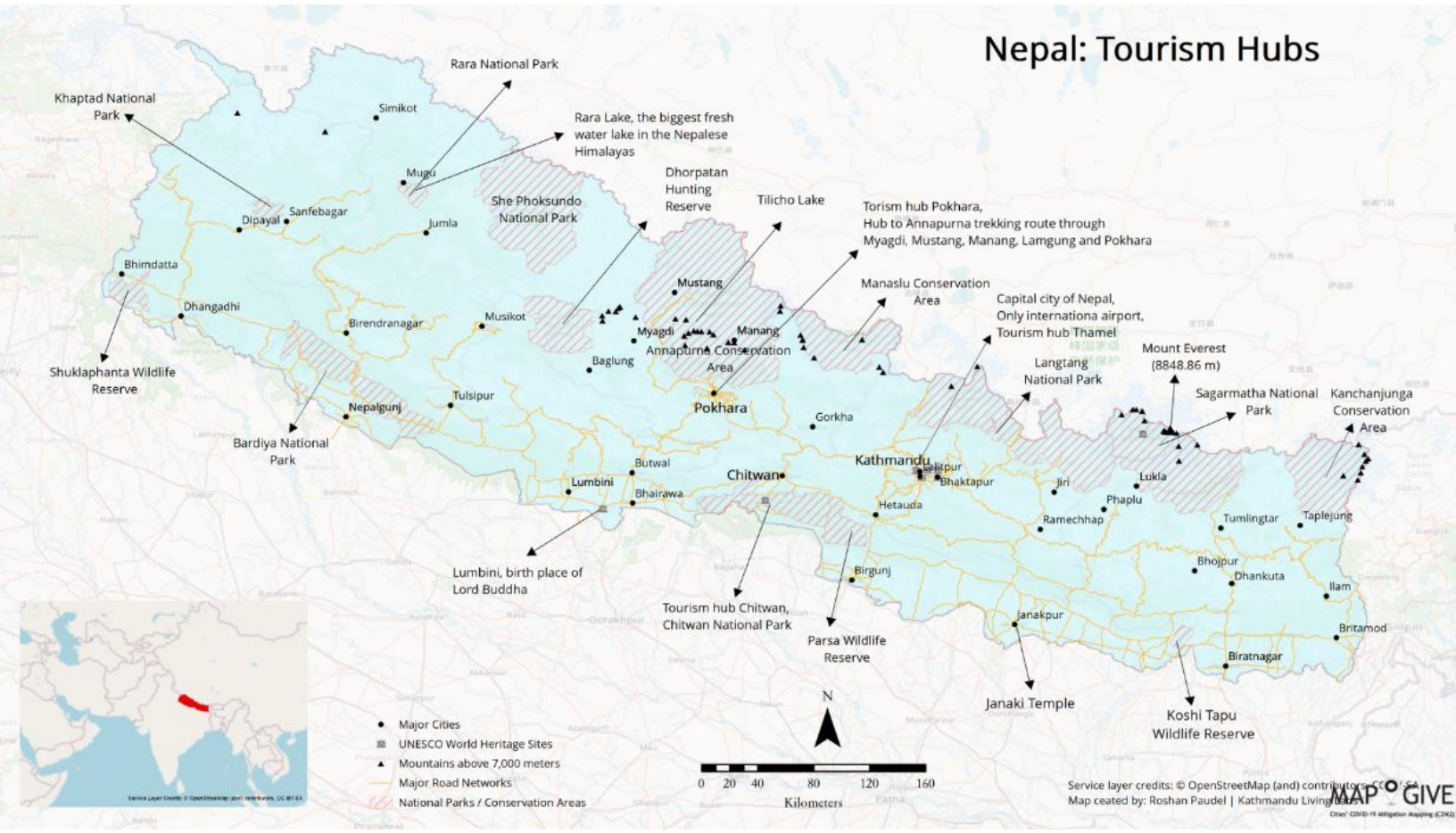


Fig 5: The major tourism hubs of Nepal

The C2M2 Kathmandu conducted two kinds of analysis. The team leveraged quantitative analysis to have a macro-level understanding on the issue. For the quantitative analysis, the team deployed separate questionnaires for tourism businesses and workers. Various tourism sector stakeholders including business associations and workers groups supported the C2M2 team in deploying the survey. Hotel Association of Nepal (HAN), Thamel Tourism Development Council (TTDC), JOTUFF, The Union of Trekking Travels Rafting Workers Nepal (UNITRAV), and Trekking Agencies' Association of Nepal (TAAN) were some of the stakeholders that supported the team to finalize the survey questionnaire and solicit responses. Similarly, qualitative analysis- through human stories- allowed the team to derive individual-level perception and impact.

Some of the key lessons learnt from the quantitative and qualitative analysis[7] are:

1. **Businesses were severely impacted due to COVID-19**
   While more than seven in ten businesses were temporarily shut down due to the pandemic, two in ten businesses permanently shut down. This speaks to the severity of the impact in the tourism industry. Only one in twenty businesses survived the COVID-19 scare. However, the last number might not accurately represent the situation on ground as many of those that had opened might not have operated in full capacity.

   As a result of the closures, the businesses took a major hit in revenues. More than sixty percent of the businesses had their revenue completely stop. Only one percent of the businesses had the same revenue in the COVID-19 lockdown period as they had before this period.

   As the revenues were affected, the businesses had difficulty covering their operating costs. Four out of five businesses in the survey mentioned that they could not cover operating costs. This came as a significant blow to the businesses as they had initially expected the business to grow in this period. As a result, around forty percent of the businesses had made "significant investments," which only worsened the impact on operations.

2. **Savings depleted substantially for the businesses**
   On one hand, the businesses were struggling to recuperate their investments and sustain operations. On the other hand, they were also forced to tap into their savings to sustain for as long as they could. In fact, many of the businesses resorted to taking loans to sustain their operations, including payments for the workforce. The survey revealed that around nine out of ten businesses were operating with negative savings.

3. **Workers are highly vulnerable to the secondary impact**
   The prolonged lockdown and travel restrictions along with the halt in revenue flow and increasing loan burden the businesses meant that a large majority of the workers lost their employment. In fact, nine out of ten businesses in the survey mentioned that their workforce had decreased during the pandemic.

   More than forty percent of the businesses asked their workers to take unpaid leave- which indicates the temporary nature of loss of employment. Some of the businesses adopted creative measures to pay their workforce. For instance, one in ten businesses introduced a rotational employment scheme so that as many of their workforce as possible could take some income home.

   As a result, an overwhelming majority of the workforce had their savings depleted during this period. Around one out of every two workers in the survey mentioned that their savings had reduced to zero. Not only did the workers see depletion in their income and

[7] Results valid as of May 2021- when the C2M2 survey was completed

savings but they also resorted to selling assets to make their ends meet. One in four workers sold personal or household items during the pandemic, which indicates that their quality of life also depleted directly due to the secondary impact.

4. **Psychological Effects due to the Pandemic is Alarming**
   While the financial impact is relatively easier to quantify, latent impact due to COVID-19 is hard to assess. One of the latent impacts pertains to psychology of the tourism sector stakeholders. To assess this impact, the workforce survey asked questions related to psychological well-being and the results were alarming- to say the least. Eight out of ten workers mentioned that they had difficulty "to not think about the situation," and almost the same number of workers mentioned that they felt "increased social pressure."

   These indicators indicate that the psychological well-being had deteriorated significantly. The fact that more than nine out of ten workers indicated that the pandemic "has had some form of psychological effect" indicates the severity of the situation. The situation is alarming not just because of the impact but because of the lack of action, either due to stigma or due to other factors, to address the severity of the issue. Eighty seven percent of the workers mentioned that they had not sought psychological support to deal with the effects of the pandemic.

5. **Businesses are concerned about the workforce well-being**
   One should, however, be measured not to point fingers to tourism businesses with regards to the situation of the workforce. More than thirty percent of the businesses mentioned that ensuring health and safety measures for the workforce is a concern for them. While it could be argued that such responses from the businesses is a public relations measure, such claims need to be further examined, especially in the context that most of the businesses, around eight seven percent, had taken out loans to sustain their operations, which also includes keeping their workforce on payroll. This argument was further substantiated during informal conversations with the tourism business owners during the qualitative interviews and informal conversations during project implementation.

Thus, the overall situation for the tourism industry looked bleak during the lockdown period, when the survey was conducted. However, in recent days there are signs that the sector is booming. Domestic flights have resumed, which indicates the increase in movement within the country. Anecdotal and observational evidence suggest that hotels, restaurants, bars, cafes, and similar tourism venues have seen a surge of domestic visitors. These signals indicate that the uncertainty, under which businesses and workers were operating during the time of the survey design and deployment, is gradually turning to optimism.

Recommendations

Based on the findings from the survey and months of intensive engagement with tourism sector stakeholders, C2M2 came up with the following recommendations:

1. Reskill and upskill the workforce
   The workforce has remained highly vulnerable to the secondary impact of tourism and has suffered both financially and psychologically. Many of them have lost their jobs permanently and might not get employed in the same sector or industry, even, as they were before the pandemic. As a result, it would be beneficial for them to undergo upskilling and reskilling training so that they can be integrated in other sectors of the economy.

2. Provide psychological support to the workforce
   While more than ninety percent of the workforce admitted to suffering psychologically due to COVID-19, a large majority of them also mentioned that they had not sought help. This could be either due to lack of awareness or due to the perceived social stigma towards mental health issues or due to other factors. Thus, it is recommended that the businesses and the government conduct well-being programs targeting the workers and entrepreneurs themselves so that they can better cope up with the stresses.

3. Provide holistic relief measures to the businesses
   Majority of the businesses mentioned that their savings had depleted and they had taken out loans to sustain their operations. They expect the government and financial institutions to provide subsidies and incentives that allow them to have a longer runway to pay back the loans. These relief measures could come in the form of tax subsidies, temporary loan forgiveness, short-term borrowing without collateral, or low-interest rate borrowing.

4. Vaccinate the tourism professionals with priority
   As the tourism sector is a service industry with extensive interaction between service providers and the tourists, it is recommended that the government prioritize vaccination for the tourism professionals, both entrepreneurs and workers. This would ensure that the sector is ready to re-open in full-swing.

5. Create a conducive environment to ensure safety of visitors and ease entry protocols
   The tourism industry in Nepal relies heavily on the arrival of international tourists. As such it is important that the government introduce policies to ease the flow and safety of international tourists. This would not just stimulate the businesses in major cities such as Kathmandu and Pokhara but also have spillover effects in other pocket areas of tourism such as Lumbini, which attracts many Buddhist religious tourists, and the Everest region, which draws mountaineers and hikers, that attract niche international tourists.

In fact, the C2M2 Kathmandu team hosted an event in mid-May to present the findings and recommendations to tourism stakeholders. Representatives from the government, associations, businesses, workforce, and media were present in the event. Among an extensive list of recommendations, the government has included several of the key recommendations in the budget.[8] While the C2M2 team does not claim the sole responsibility or to be the causal force behind the implementation of these recommendations, it does note that such measures by the government is in line with the voices the survey had captured and amplified.

Limitations and Future Directions

While the C2M2 team delivered despite a host of challenges including lockdown and rising wave of COVID-19, there were also few limitations. One of the limitations arose due to the restrictions in mobility while carrying out project activities. In-person relationship building meetings with stakeholders and ground deployment of surveys were affected due to government-imposed restrictions. The C2M2 team navigated around this issue by mobilizing online tools and resources both for stakeholder engagement and for deploying the survey. As the lockdown eased and it was safer for personnel to hold in-person activities, the team also conducted in-person activities with appropriate safety measures.

The other limitation pertained to the location. The C2M2 team focused its efforts on Thamel, which is a major tourism hub for international tourists in Nepal. Thamel is important because of the large number of tourism services it offers in a relatively dense location. This allowed the team to gather many responses from a wide range of sub-sector. However, this also meant the team's efforts were not deployed in working in places outside Kathmandu. It was also challenging for the team to work in a second city- due to the COVID-19 induced travel restrictions.

The third limitation relates to the political instability in Nepal and its impact on the C2M2 project. One of the objectives the team had developed during the year was to find a partner for project portal handover. There were conversations of initiating a task force with different tourism associations. This conversation halted in the middle as the government in Nepal changed during the period. It is important to have a buy-in from a government body for such a committee to form and take ownership of the portal formally. However, due to the change in government, there has been uncertainty about a new leadership in the ministry, which includes lack of an appointment of a tourism minister after two months of government formation. This has hampered the

[8] An extensive list of the recommendations and its implementation is included in the Appendix

activities of the ministry, including forming a task force or a committee to coordinate in this matter.

Moving forward, the C2M2 team plans to engage further with the tourism sector stakeholders to ensure the knowledge generated during the project is taken into consideration for decision-making and planning in the industry. The C2M2 team is also holding a project launch session in early October to disseminate the findings.

Appendices

Data: Spreadsheet of data

Data of Workforce survey

Data of Business survey

Data: Survey Questionnaire

Workforce survey questionnaire

Businesses survey questionnaire

Tools and Methods used to generate data

Geospatial Products: Qgis and ArcMap

Survey Data Collection: Kobo

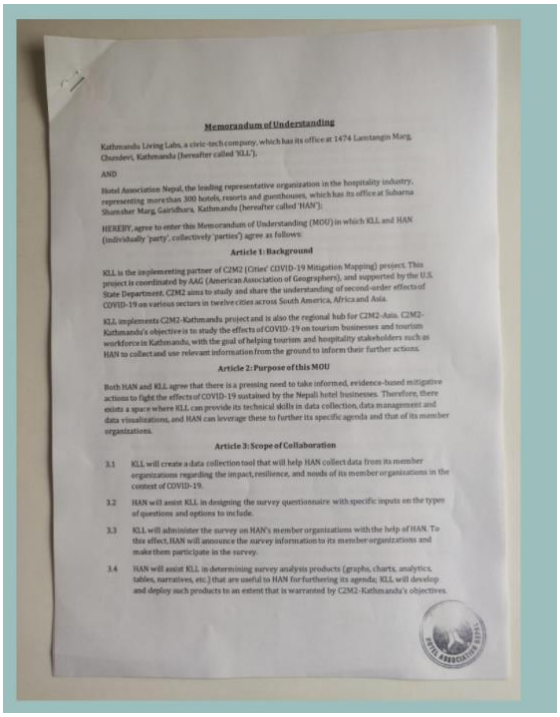
Survey Data Analysis: Python and R

Survey Data Visualization: D3 and React

Interview Data Collection: In-person semi-structured interview

Interview Data Analysis: Content Analysis

Partnerships established



Memorandum of Understanding

Kathmandu Living Labs, a civic-tech company, which has its office at 1474 Lamtangin Marg, Chundevi, Kathmandu (hereafter called 'KLL').

AND

Hotel Association Nepal, the leading representative organization in the hospitality industry, representing morethan 300 hotels, resorts and guesthouses, which has its office at Subarna Shamsher Marg, Gairidhara, Kathmandu (hereafter called 'HAN');

HEREBY, agree to enter this Memorandum of Understanding (MOU) in which KLL and HAN (individually 'party', collectively 'parties') agree as follows:

Article 1: Background

KLL is the implementing partner of C2M2 (Cities' COVID-19 Mitigation Mapping) project. This project is coordinated by AAG (American Association of Geographers), and supported by the U.S. State Department. C2M2 aims to study and share the understanding of second-order effects of COVID-19 on various sectors in twelve cities across South America, Africa and Asia.

KLL implements C2M2-Kathmandu project and is also the regional hub for C2M2-Asia. C2M2-Kathmandu's objective is to study the effects of COVID-19 on tourism businesses and tourism workforce in Kathmandu, with the goal of helping tourism and hospitality stakeholders such as HAN to collect and use relevant information from the ground to inform their further actions.

Article 2: Purpose of this MOU

Both HAN and KLL agree that there is a pressing need to take informed, evidence-based mitigative actions to fight the effects of COVID-19 sustained by the Nepali hotel businesses. Therefore, there exists a space where KLL can provide its technical skills in data collection, data management and data visualizations, and HAN can leverage these to further its specific agenda and that of its member organizations.

Article 3: Scope of Collaboration

3.1 KLL will create a data collection tool that will help HAN collect data from its member organizations regarding the impact, resilience, and needs of its member organizations in the context of COVID-19.

3.2 HAN will assist KLL in designing the survey questionnaire with specific inputs on the types of questions and options to include.

3.3 KLL will administer the survey on HAN's member organizations with the help of HAN. To this effect, HAN will announce the survey information to its member organizations and make them participate in the survey.

3.4 HAN will assist KLL in determining survey analysis products (graphs, charts, analytics, tables, narratives, etc.) that are useful to HAN for furthering its agenda; KLL will develop and deploy such products to an extent that is warranted by C2M2-Kathmandu's objectives.

Fig 6: MoU signed with Hotels Association of Nepal (HAN)

KLL's recommendations and Corresponding incorporation in FY 2078/79's Annual Budget and Program

Businesses

Fiscal and Monitory Support

Recommendations	Incorporated in the Annual Budget and program of the Government	Remarks
Reduce interest rates on existing loans and extend loan payback periods	Continuation of the last fiscal year's fund for refinancing and other monetary and fiscal support	Rs 50 Arab fund was allocated last year as a stimulus package for the industry. Many business houses have utilized this fund with a 5% interest rate.
Short term loans without collateral		
Support in Tax Reduction, VAT Return, decrease sales tax and VAT, tax deferral, exemption of fines and taxes	Concession on VAT on Diesel/Petrol, demand charge in electricity uses, renewal charge, 10 years payback period for backlogs in TAX and other fees	

Financial Assistance from Government

Recommendations	**Incorporated in the Annual Budget and program of the Government**	**Remarks**
Easing of regulatory burdens and ease in the process to borrow cash from BFIs	Government has assigned different teams at Ministry of Finance to work on making necessary procedures, and rules for timely and effective implement of these provisions	
Easy Policy for consolidations, mergers, and acquisitions	Not clearly stated	
Establishment of Tourism Protection Fund	No special fund allocated as Tourism Protection Fund	

Business Development Support

Recommendations	**Incorporated in the Annual Budget and program of the Government**	**Remarks**
Create a conducive environment to assure A. safety concern of the potential visitors B. easy entry protocols	Protocols are being regularly reviewed and revised from Ministry of Tourism and Civil Aviation, Ministry of Health and NTOs like NTB	
Accredit the services to reopen their operations and setup a strong and effective monitoring mechanism	Ministry of Culture, Tourism and Civil Aviation has assigned Department of Tourism, Nepal Tourism Board and Tourist Police for the execution of this	
Business Development Assistance A. prepare a clear-cut tourism revival strategy B. prepare and provide a source market intelligence report to the industry C. support in business promotion programs D. digital capability enhancement of the industry	A. No clear-cut strategy is developed yet. B. NTB's vice chair has assured to incorporate this in upcoming Annual Programs of NTB C. Stated to bring out a A new e-commerce law	
Incentive Policy for Airlines, Travel and Hospitality Service Operators, Travelers, environment friendly businesses	Free visas to tourists for a month period, GPS tracking system in high altitude trekking routes,	

	Replacement of petrol fuel vehicles by electric vehicles in 10years and many incentives for the buyers of EV Few Programs for Carbon Neutral Tourism Products and Eco Tourism Projects	
Do not increase the pre-fixed minimum wages of workers. Contribute SSF of the employees from the Government Side.	Minimum wages are not increased. Government has assured to contribute in SSF for the month of Jestha and Asadh 2078	
Run a national campaign A. to promote domestic tourism B. to promote international tourism C. to promote and ware health and hygiene	A. Govt has announced to provide 10days paid holiday to the government employees. by which approx. 400000 will be able to travel within Nepal. B. and C) are not stated clearly.	

Others

Recommendations	**Incorporated in the Annual Budget and program of the Government**	**Remarks**
Tax Subsidy for 5 years for It based investments/tech led businesses	Upto Rs 2500000 will be given for start-ups based on applicant's education certificate and the business plan/proposal. A challenge Fund of Rs 1 Arab is allocated for this. And these projects will be tax free for 5 years	
Restructuring of the organizations	Not stated.	
Provide vaccine to the tourism professionals with to priority	Frontline officials / workers will be given priority in vaccination	

Workforce

Recommendations	**Incorporated in the Annual Budget and program of the Government**	**Remarks**
Provide loan without collateral at discounted interest rate (2%) for upto Rs 500000.00	Not stated.	
Opportunities for employment by creating new jobs - for short and long term	PM's Employment Program was announced with the budget of 12 Arab.	
Cash grants till the period of crisis to manage daily basic needs through funds from	Not Stated in the National Budget. NTB's	

organizations like Government Funds/Development Partners Fund/ TMIS Fund	Vice Chair has said that they will find some support.	
Free Education for worker's kids for two years.	Not stated.	
Professional development trainings	Training Programs are there under various organizations under MoCTCA	
Free health checkup/treatment service		
Programs to remove tension/anxiety/stress caused by this pandemic	Not stated.	
Introduce "No trekking without Guide/Porter" to secure job opportunity	Not stated.	
Award the heroic efforts of Guides/Porters/Workers	Not stated.	

Comprehensive List of Events

Event	Event Description	Date
Stakeholder workshop: Understanding needs, Informing actions	An in-person workshop for tourism stakeholders with the objective of identifying stakeholders who can help us gather and collect geospatial and tourism data. The event contributed to reviewing and enhancing the factor map.	December 17, 202020
Stakeholder interviews and focus group discussions	In-person interviews and FGD with the following results: 1. Informed stakeholder about project goals 2. Established partnerships 3. Identified priority areas where data could support the decision-making and advocacy related goals of the stakeholders 4. Engaged them in discussion and feedback on our factor maps 5. Stakeholders' efforts to collect information around the tourism industry 6. Learned about challenges	January 10, 2021
In-person interviews of tourism workers and entrepreneurs	A series of 8 in-person interviews to know about the impacts of COVID-19 in tourism in-depth, put faces to data and support the quantitative data.	February to April, 2021
GeoNight	An in-person event on the occasion of 'GeoNight' to collect tourism businesses in Thamel, the tourism hub in Kathmandu. Data of 751 business amenities were collected in one day.	April 9, 2021

Survey fillup with different tourism associations and unions	Contacted different tourism associations and unions to fill up the survey forms.	February to April, 2021
Participation in the C2M2 Symposium	KLL showcased a video presentation on their work so far as a part of C2M2. Link here.	June 22, 2021
Nepal Tourism in COVID-19:Data | Insights | Recommendations	An online event to share results and recommendations from our research to the tourism stakeholders, the government and other relevant groups. The recommendations shared during the event were incorporated into the policies.	May 17, 2021
Participation the the C2M2 Vizathon	KLL showcased the map products they have developed so far as a part of C2M2.	September 14 2021
Nepal Tourism and COVID-19: Portal Launch Event	An online event to officially launch the Nepali tourism and COVID-19 data portal to the public.	October 5, 2021

Screen captures of the products created

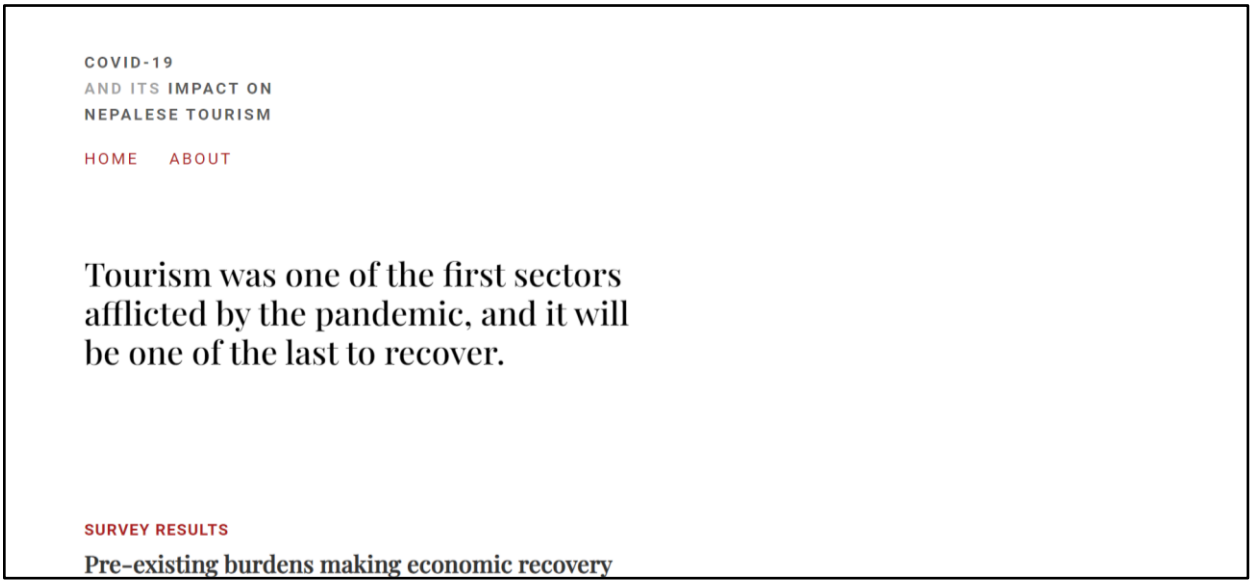


Fig 7: Web based interim report: This comprises data stories, interview stories and data analyses stemming from the survey results and in-person interviews.

Link here**.**

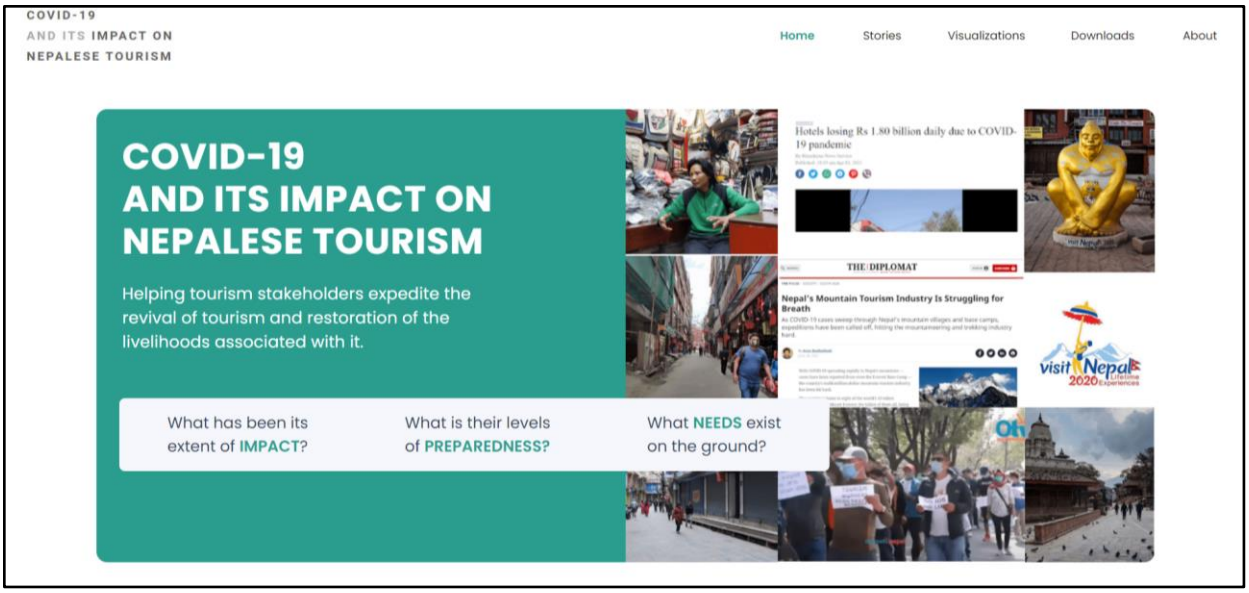


Fig 8: COVID-19 and its Impact on Nepalese Tourism Data Portal: The portal houses all the outputs including survey results, questionnaire, map products and in-person interviews conducted throughout the project duration.

Link here.

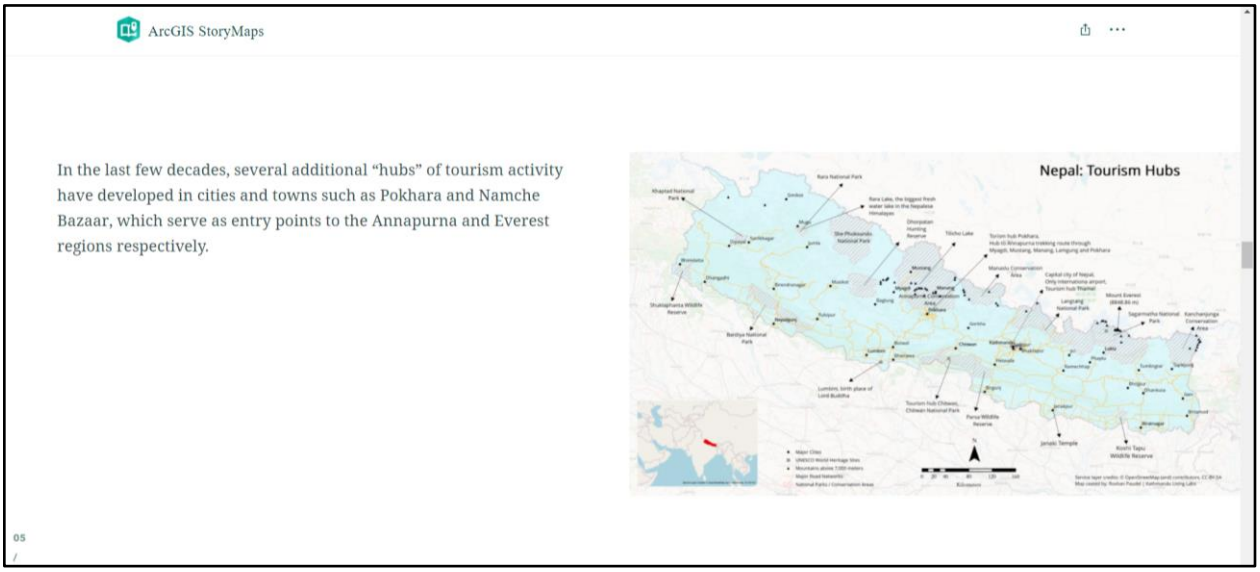


Fig 9: Story maps: The story map visualises results from the survey in the form of maps.

Link here.

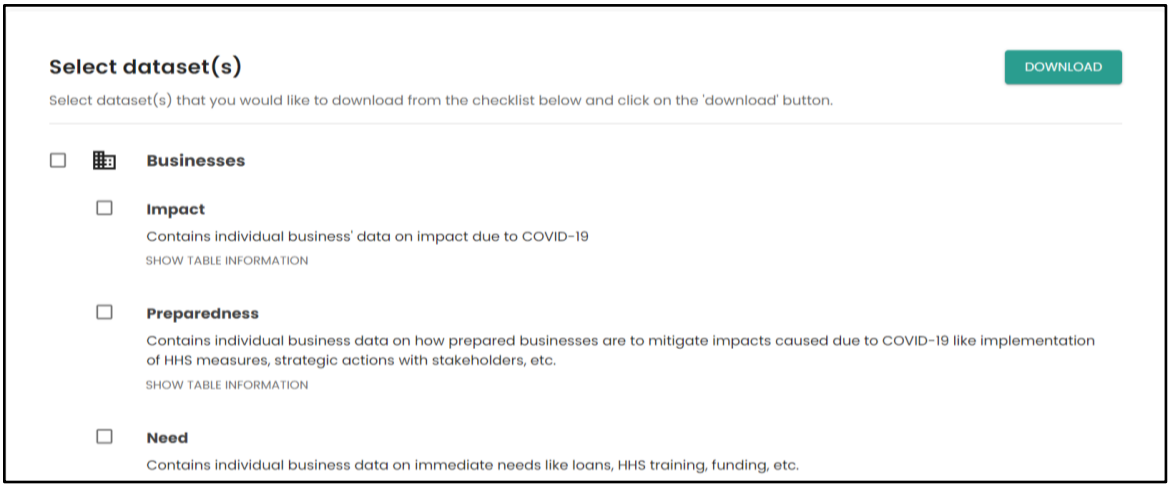


Fig 10: Downloadable data: The data collected in the survey is openly accessible and downloadable.

Link here.

Fig 11: Social media posts of stories from the ground: We conducted a series of interviews of tourism entrepreneurs and workers amidst the effects of COVID on the Nepali tourism industry. A short intro of the interviews were posted on KLL's social media page.

CITIES' COVID MITIGATION MAPPING

DHAKA BANGLADESH

OCT'2020 - SEPT'2021

A DISPLACED CITY

EXPLORING THE SECONDARY IMPACT OF COVID-19 INDUCED SOCIO-ECONOMIC DISRUPTION RESULTING MIGRATION FROM CITIES

MAP GIVE
Cities' COVID-19 Mitigation Mapping (C2M2)

THE AMERICAN ASSOCIATION OF GEOGRAPHERS 1904

boL Bangladesh Open Innovation Lab

1. Disclaimer

All information contained herein is obtained by C2M2 Bangladesh Team from sources believed by it to be accurate and reliable. Because of the possibility of human or mechanical error as well as other factors, however, all information contained herein "As IS" without warranty of any kind.

The team adopts all necessary measures so that the information it uses is of sufficient quality and from sources it considers to be reliable including, when appropriate, independent third-party sources. However, the team is not an auditor and cannot in every instance independently verify or validate information received in preparing publications.

"The views and opinions expressed in this article are those of the authors (C2M2 Bangladesh Team) and do not necessarily reflect the official policy or position of any agency of the U.S. government. Assumptions made within the analysis are not a reflection of the position of any U.S. government entity."

Table of Content

Executive Summary

Bangladesh has experienced multiple waves & surges of COVID-19 outbreak since 8 March 2020. The pandemic not only impacted the health sector, the nationwide lockdowns and other containment measures had a profound impact on both country's macro and micro economy, while gradually undermining years of steady progress in poverty reduction. The series of COVID-19 containment measures and imposed lockdowns shutting down businesses and domestic economic activities since the early phase of COVID-19 pandemic in 2020 resulted in loss of millions of people's jobs across the country. The socio-economic impact of this pandemic in the country is a serious concern at this point. The low-income groups along with the daily wage earners became the worst sufferers. During ongoing COVID-19 pandemic, an estimated sixty million urban poor living in the low-income settlements across different cities and towns of Bangladesh are facing issues due to the lack of employment, loss in income, food insecurity (deficiency and malnutrition), inadequate access to healthcare/Medicare, and increase in the violence against women and girls (SGBV). The challenges remain on proper planning and structuring for assessing the impacts of the outbreak on the vulnerable populations. And thus raises the urgent need for assessments. To explore the impact, this project has collected and assessed primary and secondary data regarding these shocks and events that are the driving forces resulting in a reverse phenomenon of internal migration. This study focuses on outlining the causal factors of outbound migration from cities and also seeks possible solution mechanisms afterwards, which will be assistive in delaminating policy framework limitations.

Because of the COVID pandemic and the restrictions imposed during the lockdown, the study area of the primary data collection for the project was limited to Mirpur in Dhaka. Information was obtained from 1186 respondents in a socio-economic survey using a structured questionnaire recorded with Android phones & application. The respondents' average age is 38.26. Males represent 52 % of the responders, while females represent 48 %. There are 56.2 % of respondents as the head of the household. The average number of family members is 4.32 (Male 2.06 and Female 2.26). This study included respondents from a variety of occupations, reflecting the project area's occupational trend. Occupation patterns are one of the major indicators of vulnerability in income and livelihood. According to the study, payments to government employees and doctors are not affected during the lockdown. Housekeepers, teachers, and caretakers/doorkeepers are less affected than others. Prostitutes, scrap collectors, and tailors are the most affected occupations based on the responses. Disabled people are particularly vulnerable and afflicted during the COVID-19 pandemic. In this study of 1186 people, 3.4 % stated that they are handicap, and 3.7 % stated that someone in their family has a disability. Single-earning women, senior citizens without help, Dalits, and disabled individuals are among the disadvantaged populations in the research region. The migration rate of single women earners and senior citizens without assistance is higher than other categories. Dalit and disabled people, on the other hand, migrated at a lower rate than non-disadvantaged people. Responses indicate respondents are already migrated from different areas of Bangladesh. Among the respondents 40.3% mentioned that they have their own residence at their place of origin. Among the respondents 85.16% lives in a rental place in the study area. There is a significant relationship between migration and one's own residence in the current location. Only 1.54% of those who found migrated during the lockdown have their own house at their current location (study area). The project's target population are low- and middle-income people who live in a densely populated area with a higher risk of COVID-19 infection. In this case, understanding and adhering to COVID-19 public health measures is important. More than 97% of respondents found aware of the COVID-19 and the public health precautions and 88.6% mentioned that they follow them.

The COVID-19 pandemic has a negative influence on income, expenditure, and the coping mechanism. Average number of earning members of the family among the respondents is 1.44. There are 1.126 males and 0.316 females among them. During the COVID-19 pandemic, job opportunities declined, and the number of earning members fell to 1.27. There are 0.98 males and 0.28 females among them. The respondents' average monthly household income was BDT.14,254. During the lockdown, economic opportunities shrank, and monthly earnings dropped. According to the respondents' response, the average monthly household income has reduced to BDT.5583, down from BDT.14,254 before the lockdown. After lifting up the lockdown monthly average family income is increased to BDT. 11358. But it is lower than the monthly average income of the pre-pandemic stages. Migration rate is higher in those who found themselves dragged back to the low-income groups during lockdown. Among the migrated respondents 62% is from less than BDT.5000 monthly income group, 26% from 5,000-10,000 income group, 9% from 10,001-15,000 and 3% from 15,001-20,000, No migration is reported from 20,001-25,000,

25,001-30,000 and more than 30,000 monthly income group. Due to the lockdown, there has been a significant reduction in the number of days worked, which has had a direct impact on monthly income and livelihood mechanisms. The number of days worked prior to COVID was 27. During COVID lockdown, the average number of days worked fell to 9, and after lockdown the number is 22.6. Among the 1186 people who responded, 40.63 % said they remained working during the lockdown. Due to a revenue shortfall, numerous employers neglected to pay salaries during the lockdown. Among the responders that are still working, 47.8% did not receive any pay during the shutdown, and 77.7% had their pay reduced as a result of the lockdown. During the lockdown, 54% of business owners and self-employed people were allowed to continue their operations. Sales are down 46.51 % of the time.

Due to declining income and opportunity people had to rely on negative coping mechanisms. More than 26% mentioned turning to borrowings to manage daily expenses during lockdown which was 3.46% at pre-pandemic stage. Income from business dropped down to 12% from 25.89%. There has been an adverse effect on savings. Average monthly savings was BDT.1873.7, while during lockdown it dropped down to BDT.545.98. During the lockdown food consumption scenario affected a lot. Before lockdown 88.79% respondents mentioned that they consumed food three times in a day and 9.70% mentioned four times. During lockdown only 67.88% of respondents mentioned that they consumed food three times in a day and 0.84% mentioned four times at the same time family food consumption is also affected. Before lockdown 91.57% families take three taking food three times in a day. During lockdown three times food intake dropped down to 63.24%. Almost 95% mentioned that there is a food price hike during lockdown.

When they failed to survive in the city with their current income and income opportunities, they had to re-migrate to another place to cope-up. Among the respondents 5.62% mentioned that they migrated with their family due to lockdown. Almost 35% mentioned financial problems as the main reason for migration, while 31.58% mentioned lockdown and 18.95% Job loss. According to the vacant household survey conducted during the same period, 1761 households out of 7397 were discovered vacant. According to the responders, 38% of the vacancies are due to the COVID-19 pandemic and the lockdown issue, while financial issues were reported by 26%. Almost 20% mentioned that they have knowledge of their acquaintances migrated due to the COVID-19 pandemic. Survey also recorded a variety of survival strategies from responders who have undergone reverse migration during lockdown. 21.8 % had to rely of supports from their friends & family, 20.58 % returned to agricultural works, 11.52 % had to spend from their saving, 8,64% turned to loans from banks & financial institutions, 6.17% relied on personal borrowings, and 5.76 % through farming as major ways to survive. Only 28.36% mentioned that they have received support during lockdown from the government or any other agencies.

1. Introduction

1.1. Background

The emergence of COVID-19 has shattered the whole world with its disastrous effect. It's a highly contagious disease that has caused concern as it can easily transfer from one person to another like a snowball effect. Bangladesh, as well as other countries, has been affected by it; the impact of which is visible everywhere. Bangladesh discovered the first case of COVID-19 on March 08, 2020. Since then, Bangladesh has experienced multiple waves of surges leaving a devastating effect with not only cases & fatalities, but also to the life and living of the people in this region. As of 30 September 2021, more than 1.5 million people got infected, while almost 30 thousand people died of COVID-19. The Bangladesh Government has initiated a mass vaccination campaign since 27 January 2021 to curb the outbreak. As of 30 September 2021, more than 34 million people received their 1st dose of vaccination while more than 17 million received both the doses.

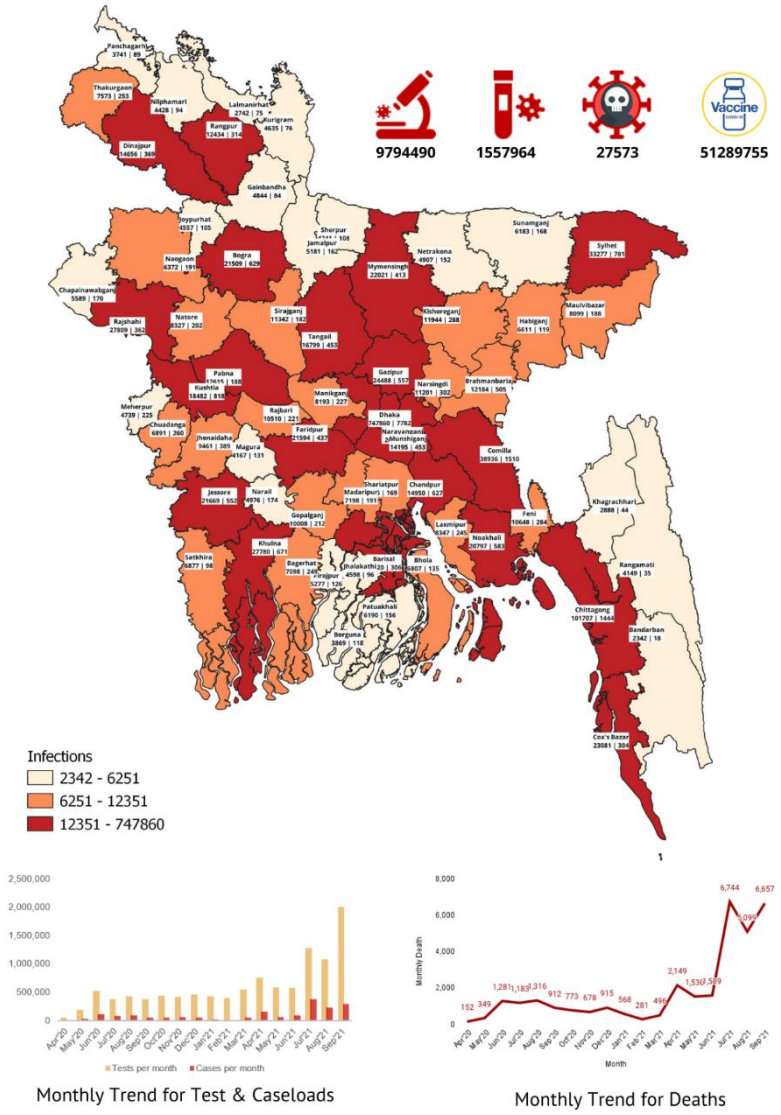


Fig: COVID-19 trends & stats for Bangladesh as of 30 September 2021 (DGHS & WHO 09/2021)

The COVID-19 pandemic in Bangladesh not only impacted health, the nationwide lockdowns and other containment measures had a profound impact on both country's macro and micro economy. The nationwide lockdowns initiated during the early phase of COVID-19 pandemic in 2020 resulted in loss of millions of people's jobs caused by a series of COVID-19 containment measures and imposed lockdowns which shutdown businesses and domestic economic activities across the country.

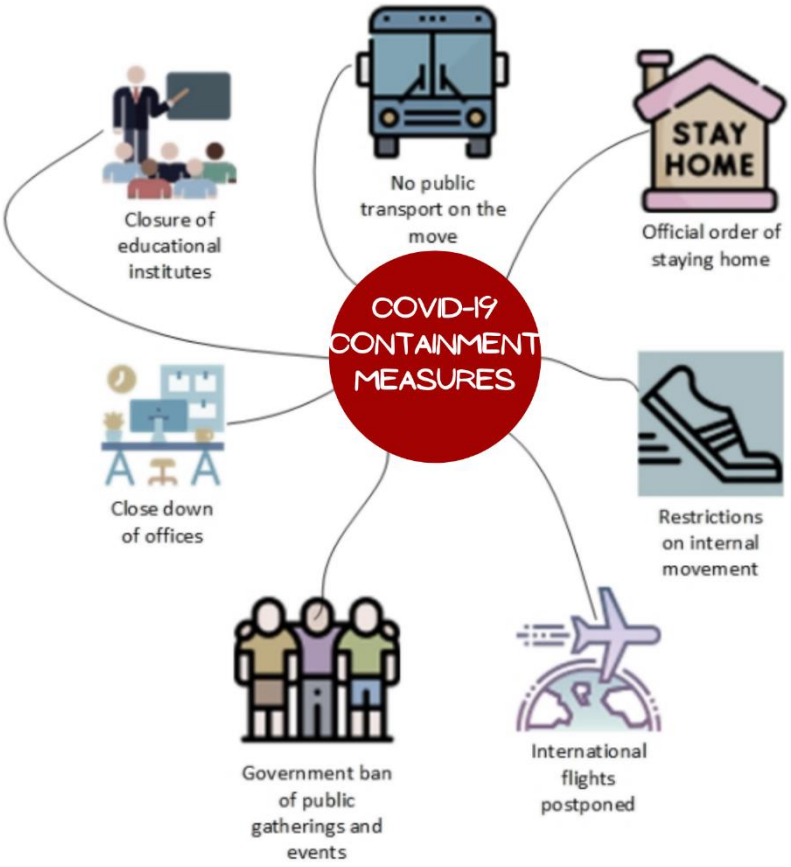


Fig: Containment measures imposed by the Government in Bangladesh

This led to a significant rise in poverty rate and a projected shortfall in countries GDP compared to the previous years. In the past ten years, GDP growth for Bangladesh had improved especially in 2019 when the GDP was estimated to have reached 7.9%. In 2020 the Bangladesh GDP was projected to fall due to economic downturns resulting from COVID-19 pandemic economic lockdowns (IMF 04/2020). Although the challenge with the socioeconomic situation in Bangladesh is that High GDP growth rate has not been effective in fostering faster poverty reduction (World Bank Group 2019), the COVID-19 socio-economic situation, estimation from the General Economic Division shows Bangladesh's poverty rate might rise to 29.5% as of June 2020 (9% increase from 20.5% in the 2018/2019 fiscal year). The localized impact of COVID-19 induced economic disruption in Bangladesh was predicted to push millions of people back into extreme poverty in 2020, especially people working in the informal economy, whose incomes dropped significantly since the start of the pandemic. This is feared to make the achievement of Sustainable Development Goals (SDG) in Bangladesh even more challenging (SDG Report 06/2020). For the last 15 years, Bangladesh's poverty rate had steadily reduced from 40 % in 2005 to 20.5 % in 2019 (Dhaka Tribune 08/2020; BBS 2019). While the country's economic growth had declined to 4.3% in the 2019-2020 fiscal year, the growth projected to be 5.1% in the 2020-2021 fiscal year and 7.6% in 2021-2022. According to the government announcement, Bangladesh achieved 5.2% growth in the 2019-2020 fiscal year while the World Bank estimated the economic growth at only 2% and the International Monetary Fund (IMF) at 3.8%. Export earnings witnessed a growth of 2.54%. Meanwhile, the foreign currency reserves reached a record height of $43

billion, which was $39.31 billion on September 30, 2020. The annual average inflation rate reached 5.69% in September 2020 (Dhaka Tribune 01/2021).

Fig: Most impacted sectors during pandemic

At the micro level, the country experienced a significant rise in unemployment among the low-income group, of which 90% of the employed work in the informal sector. As per ILO statistics in 2016-17, the total work force population of Bangladesh stands at 63.4 million of which 68.7% are male and 31.23% are female. Meanwhile, the urban landscape has 17.6 million workers of which 12.8 million are male and 4.8 million workers are female respectively. It is noteworthy that, according to the Labor Force Survey 2017 by ILO, around 60.8 million people were engaged in various jobs where the informal sector dominated with 85.1% of the employed population. A significant portion of these are the daily wage earners such as transport workers and vehicle drivers, street hawkers and vendors, small businesses, tea-stall or food stall owners and daily laborer. The RMG sector, which contributes to almost 80% of the country's export, was severely hit by the cancellation of orders worth USD 3.15 billion, resulting in massive layoffs. A rapid perception survey conducted by BRAC in the early lockdown period in all 64 districts of Bangladesh showed that the economic impact caused by the countrywide shut-down affected 93% of respondents. Daily wage earners in the non-agricultural sector reported the most significant income losses (77% respondents) compared to those in the agricultural sector (65% respondents). In urban areas, BRAC study showed a significant income drop for 69% of respondents, but was still lower than in rural areas where it reached 80% (BRAC 09/2020). IFC and The World Bank study reveals that 94% of medium and small enterprises in Bangladesh faced direct negative impact from COVID and lockdown (IFC 10/2020). A survey on the impact of the pandemic on Bangladesh's Micro, Small, and Medium Enterprises (MSMEs) in 2020, revealed that around 83% of firms reported losses and 64% closed temporarily. Across sectors, 94% of businesses have experienced sharp drops in sales. These business losses have choked cash flows, with 33% of firms saying they are unable to pay installments on existing loans (World Bank 02/2021).

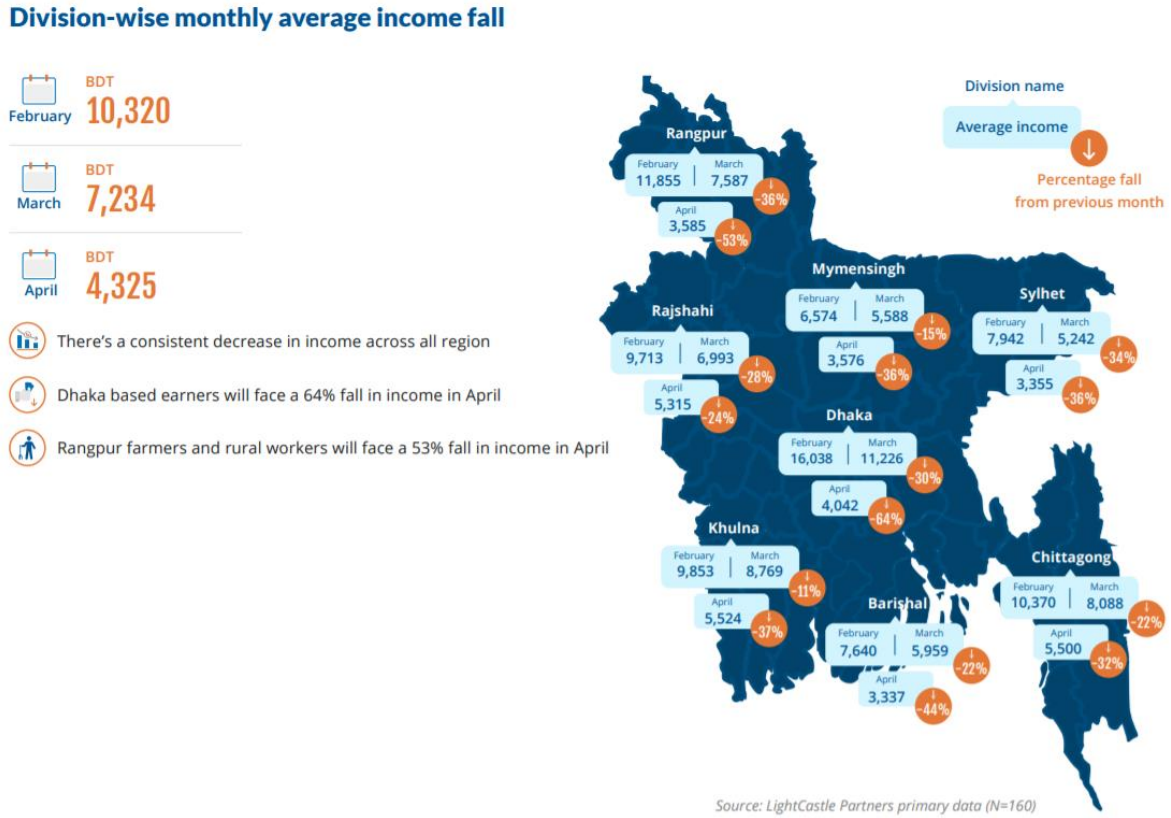


Fig: Declined income trend during COVID-19 lockdown in 2020 (Light castle Partners 04/2020)

With GDP (Gross Domestic Product) growth decelerated, and poverty increased, the pandemic aggravates risks of long-term economic implications as a result of reduced female labor force participation, learning losses, and heightened financial sector vulnerabilities (World Bank 03/2021). The economic disruptions caused by COVID-19, have caused major changes in the income and earning opportunities for people. 41%-45% drop in income was visible in the moderate poor, vulnerable non-poor and non-poor income category considering the poverty line for each group while it was less suffered by the extreme poor group which was around 34%. (BIGD 2020). According to a Policy brief by BRAC and UN Women, there was a presence of at least one person who lost a job that represents around 34% of the response and 77% faced an income loss by any means. Reports estimated that the disastrous effects of COVID-19 will severely affect over 5 million people in Dhaka city alone. Substantial numbers of people will have very limited livelihood options, and will face increased vulnerability to food insecurity, heightened debt exposure and spiking cost of living. Despite the multilayered interventions initiated by the Government and the rebound in the later part of 2020, the overall economic recovery remains slow particularly due the second wave of COVID-19 infections in Bangladesh which started in mid-March of 2021, necessitating another series of strict nationwide lockdowns starting from early April 2021 and stretched till early August 2021.

Dhaka, the capital of Bangladesh is the center place of all economic activities where a larger portion of the diverse population fulfills their daily necessity through different economic activities. A large portion of the low- and middle-income population of the city are internally migrated from different parts of the country in search of better livelihood opportunities. Bangladesh's 19 coastal districts and those along major river banks like Padma, Meghna and Jamuna are among those with the highest disaster risk (DMD, GoB). The first group is vulnerable to tropical storms and the latter to riverine and flash floods. Many agricultural households find themselves unable to absorb repeated economic losses caused by both sudden and slow-onset disasters in the longer term and may move to urban areas such as the capital Dhaka in search of work (IDMC 2021).

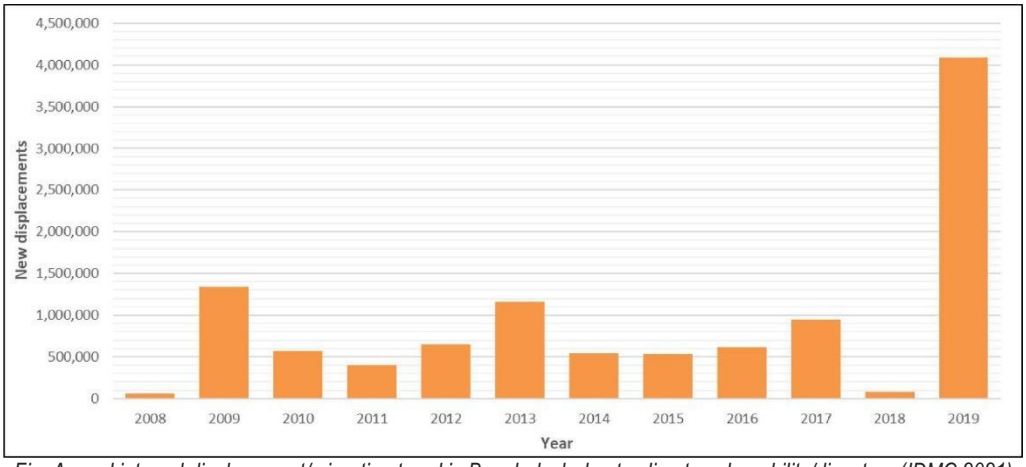


Fig: Annual internal displacement/migration trend in Bangladesh due to climate vulnerability/disasters (IDMC 2021)

In the case of spatial patterns of urban destinations of migration, Dhaka alone captures 42% of total lifetime (UNFPA 2016). But since April 2020, Bangladesh experienced an unusual phenomenon of internal migration reversed from rural-urban into urban-rural following the containment measures & lockdowns imposed by the Government of Bangladesh to control the COVID-19 outbreak. Almost 10% of the households living in the low-income urban settlements had to migrate to their villages during the lockdown (HDRC/UNDP 2020).

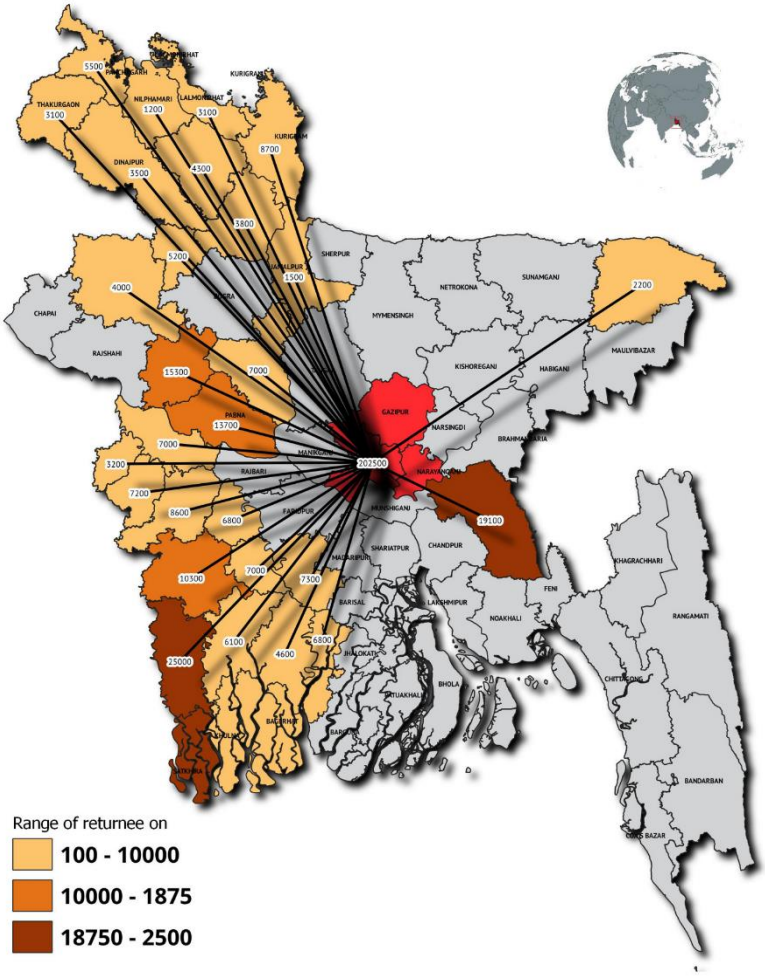


Fig: Reverse Migration from Dhaka to other part of the countries following COVID-19 lockdown in 2020 (IOM 04/2020)

Meanwhile, before the pandemic, Dhaka faced a big problem of mass influx of people, due to its employment opportunities. Now, millions of these internal migrants/ IDPs leaving Dhaka and going back to their places raises several issues for the country. First, this directly aggravates the risk of spreading the virus. Second, these places do not have sufficient infrastructures to support the incoming population. Third, these places, especially the coastal areas, are already vulnerable to climatic hazards.

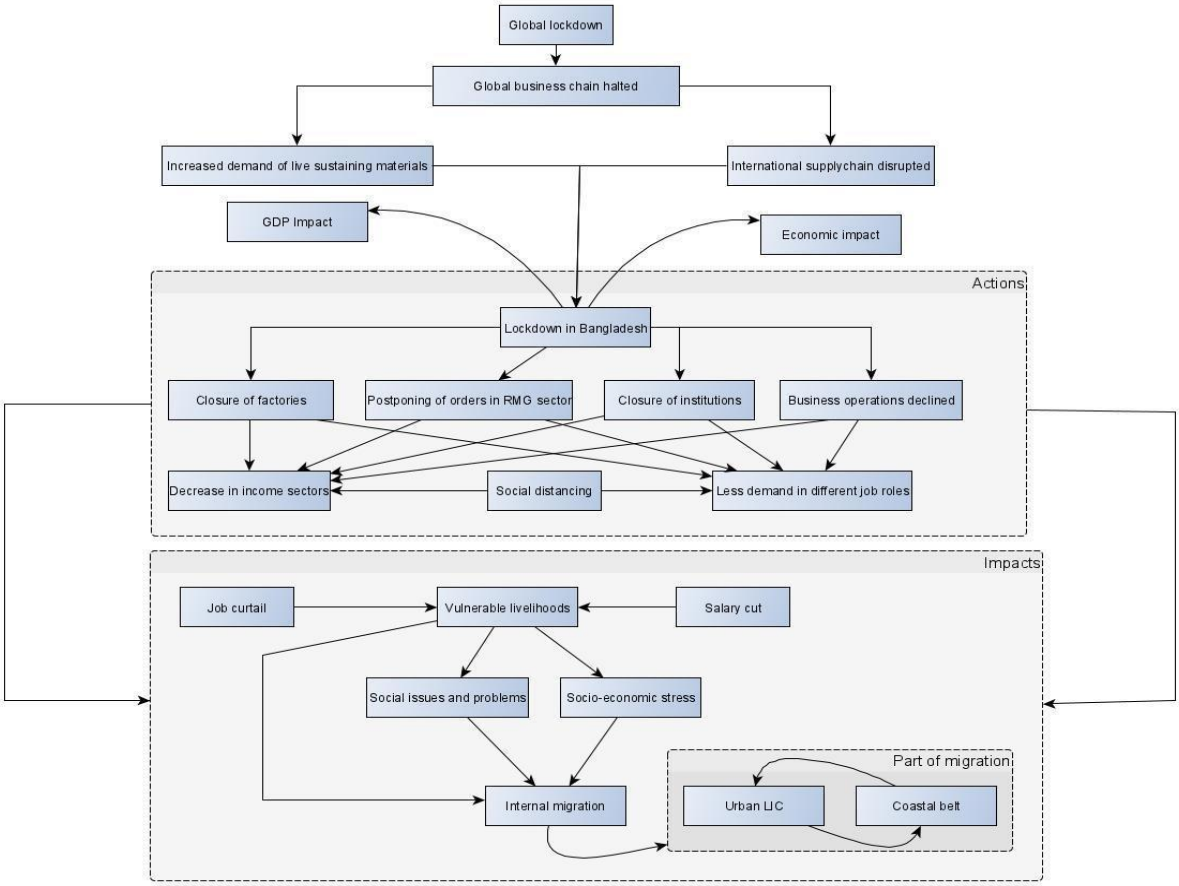


Fig: Conceptual cause loop diagram for COVID-19 induced internal migration

Therefore, it is in the strong interest of Bangladesh to check this rapid internal migration for the long-term health of the nation. All the while, the nation lacks the infrastructures (both at the national as well as the local granular levels) to assess the magnitude and the after-effects of such exodus. For example, there is no consolidated information on where these people are actually going back to, or what infrastructures exist in the areas to support these incoming people. Governments (and other concerned bodies) would find such information massively helpful for their planning purposes.

1.2. Goals and Objectives

This project aims to support local authorities, leaders and policy-makers -- especially those in cities and other urban settlements -- in identifying the effective approaches to plan for and mitigate the effects of COVID-19-induced internal migration out of Dhaka.

To that effect, the project aimed to:

I. Collect data on the migrants and the existing physical infrastructures in the focused areas,
II. Develop and share analysis products to the concerned stakeholders,
III. Constantly engage the stakeholders throughout the project.

Considering the situation, this project conducted an explorative study to gather secondary as well as primary datasets on the background factors which are forcing these people to re-migrate. The study focuses on outlining the causal/situational factors of outbound migration, explore to connect the puzzle and also seek suggestions & answers for the solution mechanisms afterwards: which may be assistive in delaminating policy framework limitations. The resultant data and products will be taken into consideration while determining urban vulnerabilities and devising strategies to enhance the prevention, preparedness and readiness for secondary impact of COVID-19. The overarching goal of this project is to facilitate a robust response and support eventual recovery from the pandemic's secondary impact in Bangladesh. Thereby, this study project seeks to solicit, collect, document, analyze and present such information to the concerned authorities so that they can make effective and informed decisions.

1.2.1. The Expected Outcome of the Project Findings

The expected outcome of the project is to unravel the underlying causes of the unprecedented outbound urban-rural migration of low-income population (especially to the vulnerable coastal belt). Assessing the findings, policymakers may have a baseline to formulate effective policies that will stop possibilities of such displacement in the future shocks & events. Most importantly, Government and development NGOs may be able to take time-worthy steps to safeguard the livelihood of these marginalized communities. Integration of social science and economic scholars of the country in the research might become another valuable side. The anticipatory analysis also aims to provide a rapid overview of the socio-economic impact of the ongoing COVID-19 pandemic and its inevitable impacts on most vulnerable groups and other sectors among the city population.

This project findings not only focuses on identifying the vulnerable areas, but also gathering real-time data, demographic analysis of marginalized people struggling below the poverty line, outbound migration analysis of the cities, market analysis, policy suggestions and implication with area-based outlook for a Technology & Innovation backed coordinated mitigation policy framework as a byproduct of the studies & surveys inclusive.

1.2.2. Key Performance Indicator

I. Database
II. Migration mapping
III. Study on the livelihood situation on re-migrated people at the study area

1.3. Methodology

The study employed a mixed approach of both qualitative and quantitative methods. Data was collected from both primary and secondary sources using PRA tools and structured questionnaire(s) checklists and literature review.

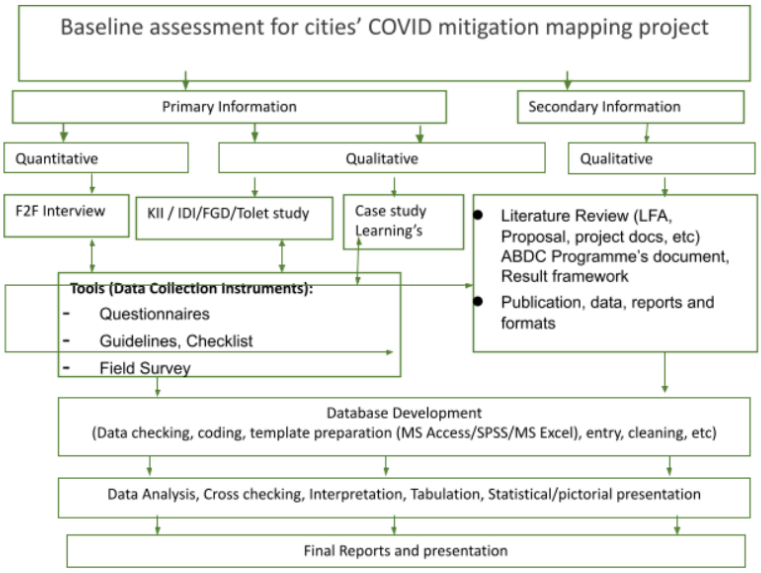


Fig: Project Workflow

1.3.1. Literature Review:

For the conceptualization of the study, literature review is conducted with secondary sources such as relevant papers and project reports. Sources include, but not limited to; INGO reports, research papers, international donor organizations, local institutional reports and newspapers both local and international. Quantitative data from the secondary sources also has been custom compiled as reference evidence in the report.

1.3.2. Primary Data Survey:

In support of secondary data, a randomized sample survey was conducted in the study area to find whether it strengthens the secondary statements. Primary data collection incorporates both quantitative and qualitative approaches. The primary data survey followed a mixed method model that included a quantitative survey with semi-structured questionnaire, focus group discussion with the community youths, Key Informant Interview with the local business owners and local government authority, and vacant household survey. The study tried to gather evidence of COVID-19 impacts based on two timelines which are before the pandemic and during the first strict lockdown imposed. Randomized responses were collected though there was a focus on low-income and lower-middle income people from the area. Moreover, several field visits took place to gather knowledge based on field observations. Another aspect of the study includes gathering feedback from small size business operations to understand their experience separately. The questionnaire was coded into Kobo-toolbox to deploy in the field.

1.3.3. Time Period of the Primary Data Survey

May – July 2021

1.3.4. Framework of the Survey

A structural data framework is developed based on the causal loop analysis for the structure survey questionnaires. Data Metric is assessed based on the framework.

WHY		WHAT		Data Type
Internal Migration	Livelihood Vulnerability	Income	Employment Scenario	Job types, Job Loss, Location of Job
			Business Data	Business Type, Disruption Data, Sales Info, Order of Impact
			Family/Wages	Type of Income source, Income changes, Family Size, Family Income, Male: Female, Disability
			Remittance	Migrant No., Remittance Change
			Coping Strategy	
		Food Security	Consumption	Daily consumption frequency changes, Nutrition Index
			Affordability	Budget Change, Commodity cost change
			Access	Food Availability, Market location
			Coping Strategy	
Gender Vulnerability			Gender	Consumption Disparity
		Education	Access	Male Female Access Ratio, Institute location, School Feeding Program
			Affordability	Costing change, Added online education equipement cost
			Coping Strategy	
			Gender	Dropout ratio male:female, Child marriage
Health Services		Capacity	Facilities	Covid Facilities, General Facilities
			Distribution	Health services distribution
		Accessibility	Distribution	Service Point Location
			Affordability	Ownership type, Cost of COVID Testings, Budget for medical expenses, Govt. Subsidy scenario
			Gender	Access to Female hygiene products, Gender discrimination for access

Fig: Structural Data Framework based on causal loop

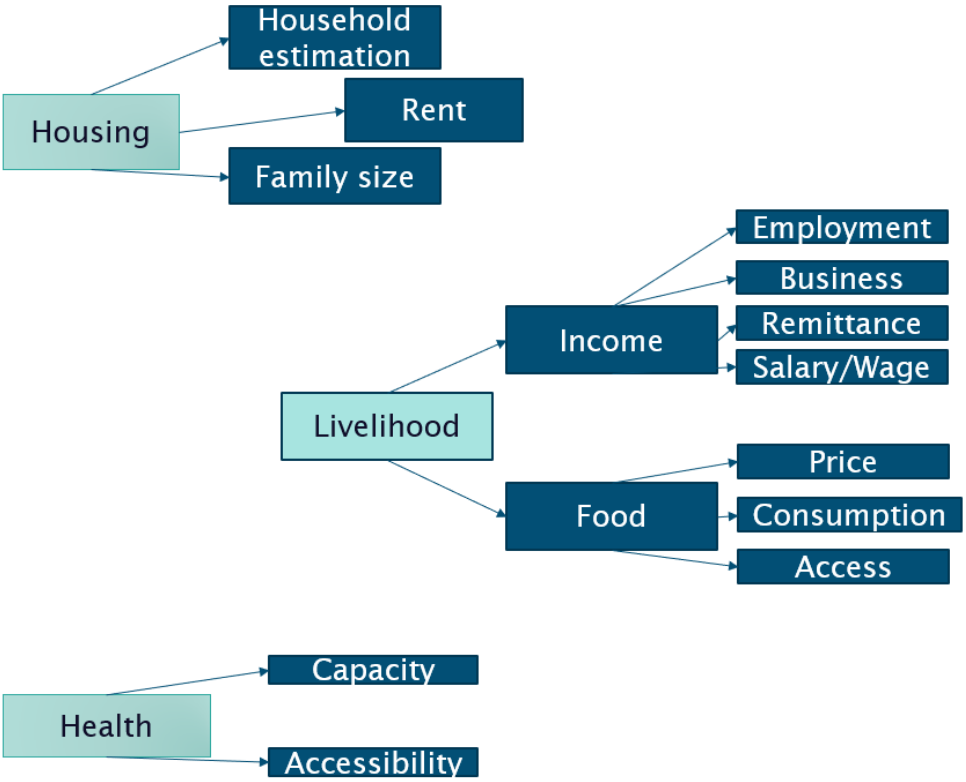


Fig: Data Metric for Survey Questionnaire

1.3.5. Sampling Method:

The targeted respondents were identified using a random sampling method. It is appropriate to determine a representative sample size of respondents under COVID-19 stressed situation. We used the statistical formula appropriately fit by Daniel (1999) for calculating the sample size whether it validate the size of data collection sample:

$$n= \frac{Z2\ x\ P\ XQ}{e2} \text{x design effect}$$

Where,
n = Sample size with finite population correction,
P= Through, we know that 77% of households in Bangladesh lose a proportion of their average monthly income due to COVID-19 during April to October 2020 (Source: Dhaka Tribune, 25 June 2021), So, we consider that P=0.77
Therefore,
Q = 1-p=1-0.77=0.23
'Z' is the normal variate, which is 1.96 at 5% level of significance with 95% confidence interval;
'e' is the precision level which is considered 3% for this study (if margin of error is 3% the e=0.03)

$$n= \frac{1.96x1.96x0.77x0.23}{0.03x0.03} \text{ x } 1.5$$

$$n= 1133.91 \sim 1134$$

Thus, data was to be collected from a total 1134 respondents under the crisis situation of COVID-19 pandemic. For simplifying the respondents' distribution, a total of 1186 respondents were selected randomly from the survey areas. Among them 52% male and 48% female. 459 respondents selected from ward no 1, 308 form word no 2 and 419 from word no 3.

1.3.6. Sample Size

Table 1. Sample size			
Tools / Methods	Sources on information and number		
	Male	Female	Total
F2F interview (Questionnaire survey)	617	569	1186
Vacant household survey			7397
Key Informant Interviews (KII)	59	4	63
Focus group discussions (FGD)	30	22	52

Table 2. Ward wise sample distribution for socio economic survey					
Ward:	Female		Male		Overall
	Number	%	Number	%	
2	181	39.4%	278	60.6%	459
3	122	39.6%	186	60.4%	308
5	266	63.5%	153	36.5%	419
Total	569	48.0%	617	52.0%	1186

1.3.7. Quality Control of the Survey

In every step ethical consideration was ensured for this survey. Training was conducted to make the enumerators more skilled and acquainted with android application for data collection, project indicators and data collection methodologies for the survey. The team has developed a Kobo toolbox based android application to make the data collection process error free and unbiased. A written instruction of data collection was supplied to all of the enumerators. Beside that following step were ensured for data collection:
In every step of the survey quality ensured as per below

I. There was a supervisor to observe and monitor the process
II. Cross checking database on a regular basis and random supervision (Field check) in the field was followed.
III. During field work the supervisors check for completeness and consistency of the information on a daily basis
IV. After field work, a briefing meeting was held, quantitative data was verified, cleaned and analyzed using Statistical Package for Social Sciences (SPSS). During this process there were quality checking provisions in each of the steps of database management. In-case of inconsistency further checks were done with respective field supervisors and enumerators.

1.4. Limitation of the Study

I. COVID-19 health security concerns and restrictions were encountered during the survey. The team had to perform physical surveys in a limited area because the intended beneficiaries are unfamiliar with online surveys.
II. For those who have already stayed back to their permanent address, the data doesn't reflect their responses. Thus, it is quite impossible to collect exact data/ count of the permanent migrants. The whole responses remained biased to the responses from key informants and people with temporary migration records during the period.
III. The lockdown period is long and was separated into multiple time periods. Receiving feedback on the lockdown time via a survey is crucial right now, especially in terms of revenue and compensation mechanisms.
IV. The obstacles that the target respondents had before their first migration to Dhaka were not addressed by this survey.
V. The challenges that the target respondents faced while they were staying at the migrated places are not captured adequately by this survey.
VI. As COVID-19 pandemic is not over yet and there is fear of more waves in coming days, the data here is not enough to predict any comparative scenario of pre, during and post COVID-19 timelines.

2. Demography

2.1. Study Area

According to Fraenkel and Warren, population refers to the complete set of individuals (subjects or events) having common characteristics in which the researcher is interested. Visualizing the COVID-19 impact in a generalized context, the Mirpur area represents a perfect blend of population or demographic diversities. Mirpur area comprises 9 wards where the study will be conducted in wards no 2,3 and 5. According to the sampling standards, purposive sampling has been applied in the case which represents at least 30% of the total no of words.

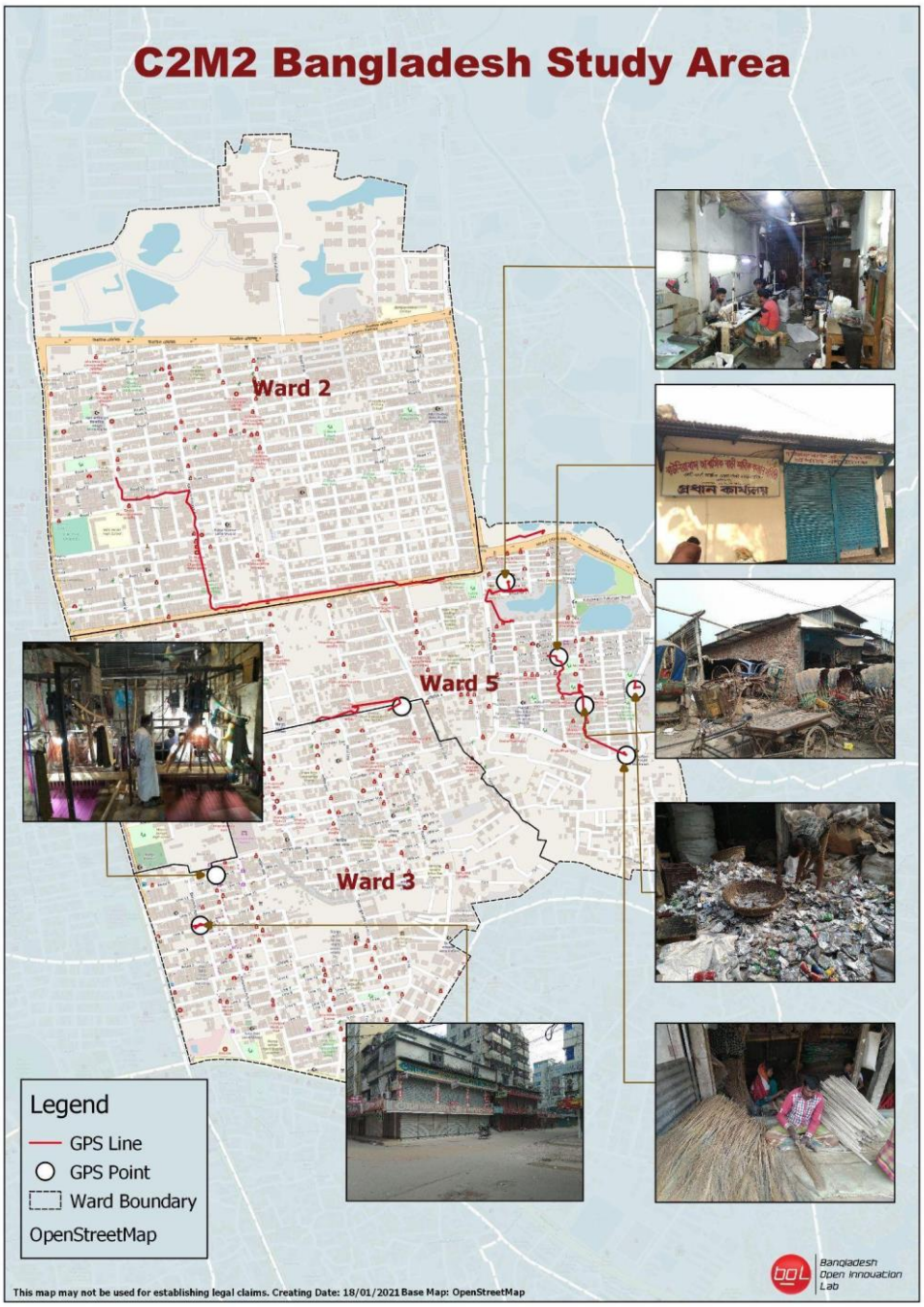


Fig: Photo Map of the Study Area (BaseMap: OpenStreetMap)

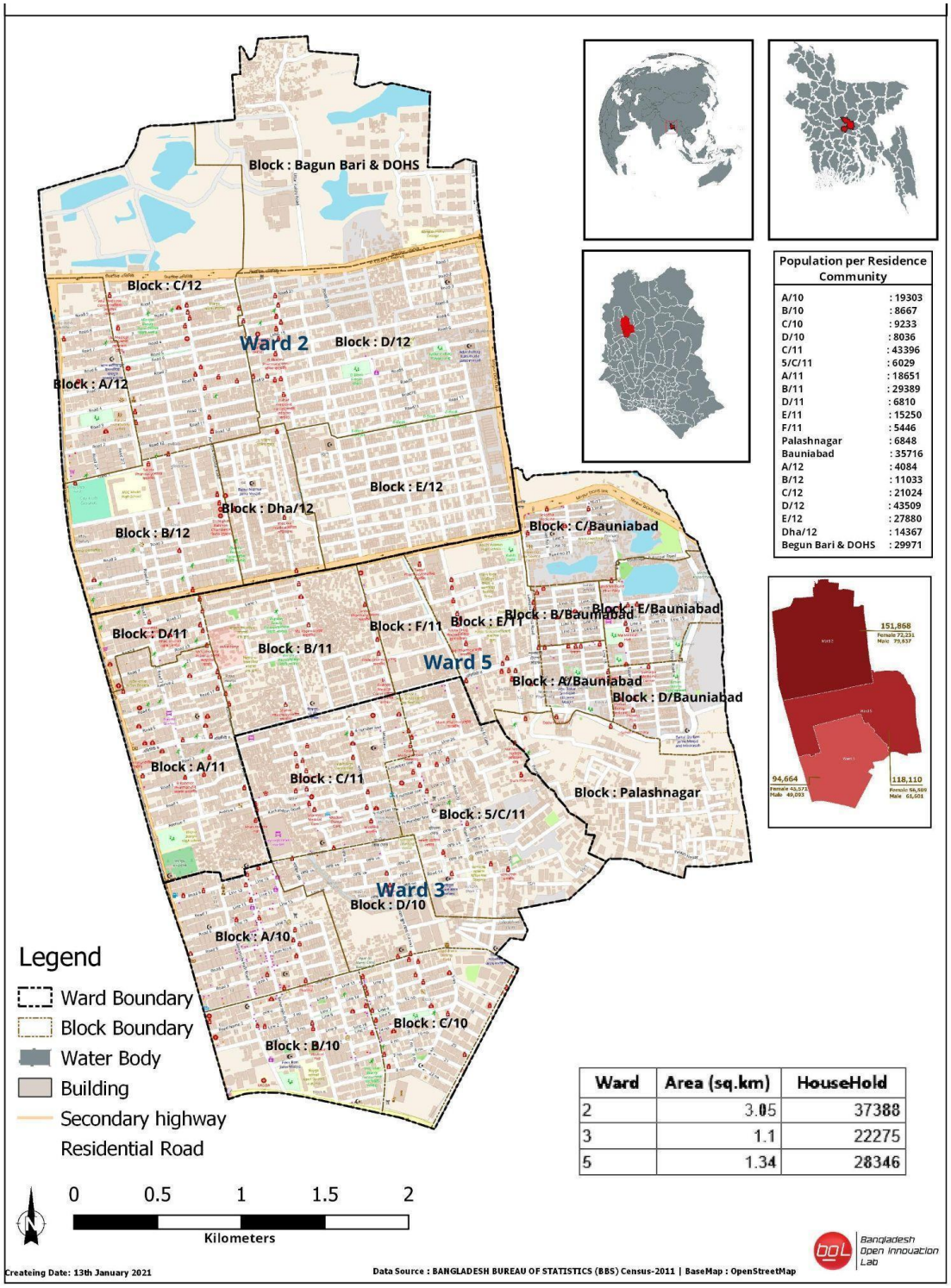


Fig: Study Area Map with block wise population (Base Map: OpenStreetMap; Pop Data: BBS 2011)

The study area map shows the population distribution from the last national census data of 2011. The study area was chosen based on the population demographic of the vicinity which largely represented the condition of the Low- & Mid-income population in Bangladesh, amidst COVID-19. The study area map is created using multiple overlays and OSM base map. Out of the 3 wards in the project study area, the population is seen to be highest in Ward 2(151,868) and lowest in Ward 3(94,664).

2.2. Characteristics of Respondents

Socio-economic Information was obtained from 1186 respondents in the socio-economic survey using a structured questionnaire recorded on an Android application.

2.2.1. Gender, Age, Education

The respondents' average age is 38.26. Males represent 52% of the responders, while females represent 48%. 56.2% of respondents are the head of the household. Among those polled 82% are married, 10.5% are single, 5.6% are widowed, 1.7 % are separated, and 0.3% are divorced. The average number of family members is 4.32 (Male 2.06 and Female 2.26). Majority of the respondents (58%) have minimum or no education.

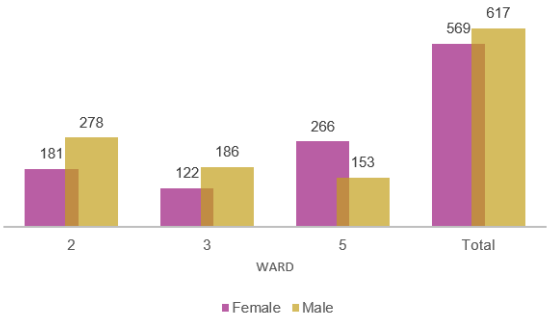


Fig: Gender distribution of the respondents (n=1186)

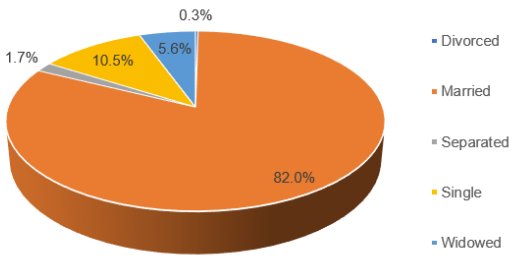


Fig: Marital status of the respondents (n=1186)

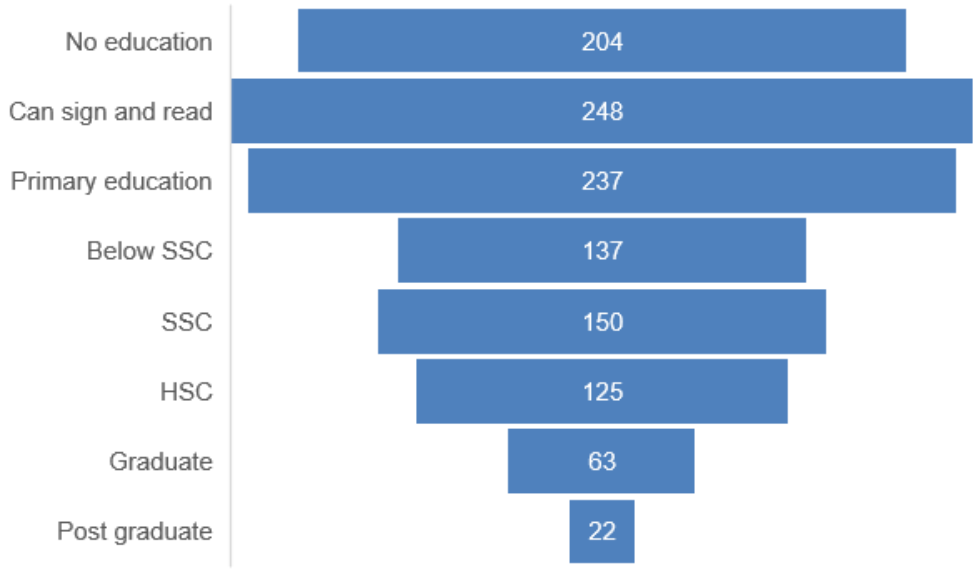


Fig: Education Level of the Respondents (n=1186)

2.2.2. Residential Status

Majority of the respondents (75%) of the survey migrated from different areas of Bangladesh which they used as permanent addresses. Among them 51.8% migrated from the Major flood prone mid-western river (Padma & Jamuna) basin districts, while 41.4% migrated from the cyclone & flood prone southern & coastal districts of the country.

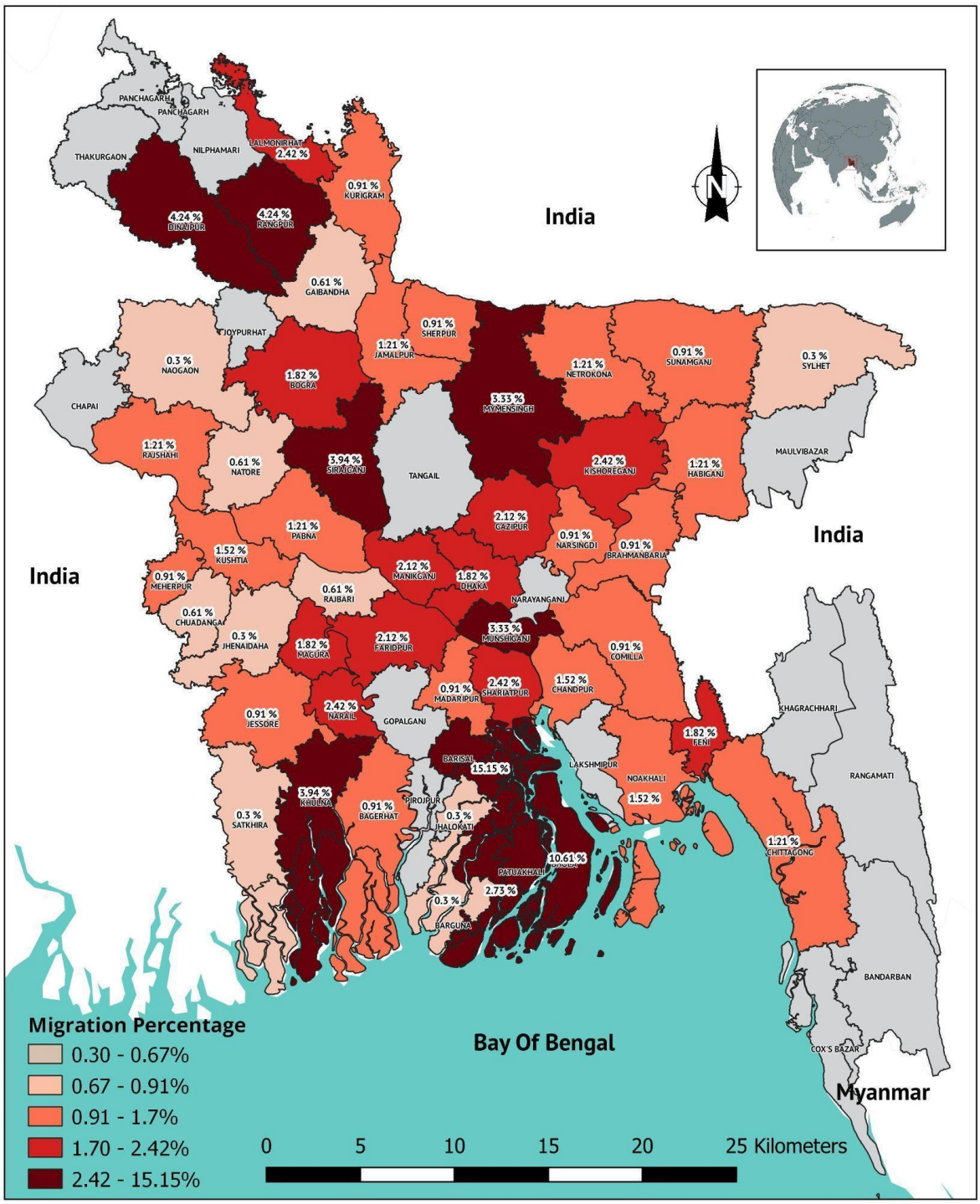


Fig: Map of origin for the respondents (Field Survey 06/2021; n=1186)

Among the respondents 40.3% mentioned that they have their own residence at a permanent address. 14.84% respondents mentioned that they have their own residence in the study area and 85.16 % have a rental place for residents.

Table 3. Own residence at Place of Origin

	Yes		No		
Ward:	Number	%	Number	%	Total
2	210	45.75%	249	54.25%	459
3	111	36.04%	197	63.96%	308
5	157	37.47%	262	62.53%	419
Total	478	40.30%	708	59.70%	1186

Table 4. Current residential status

	Own place of residence		Rented place of residence		
Ward:	Number	%	Number	%	Total
2	50	10.89%	409	89.11%	459
3	53	17.21%	255	82.79%	308
5	73	17.42%	346	82.58%	419
Total	176	14.84%	1010	85.16%	1186

2.2.3. Occupation

This study included respondents from a variety of occupations, reflecting the project area's occupational trend. 13.32% of respondents work as a housemaid, 13.32% are self-employed, 12.73% work in the private sector, 7% work in garments, 6.92% work as a migrant worker, and 6.66 % work as a housewife. 5.82% of respondents work as a rickshaw or van driver, and 5.40% work in manufacturing/factories.

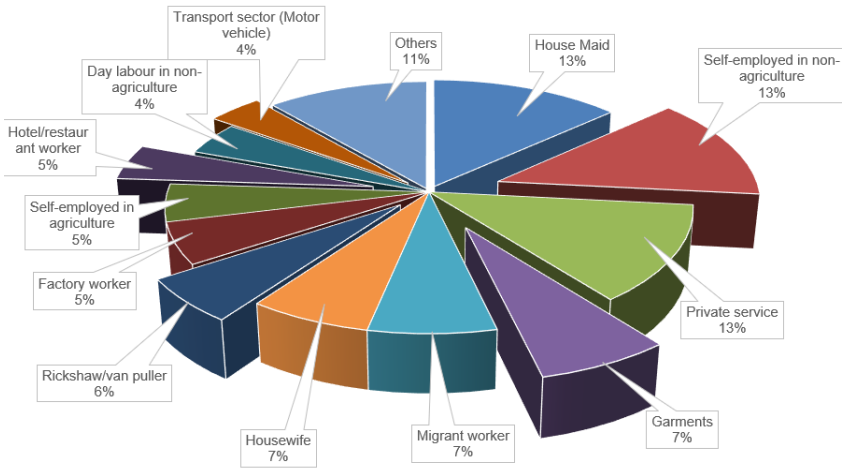


Fig: Occupational composition of the respondents (n=1186)

2.2.4. Disadvantaged Group

Disadvantaged groups in the study area include single-earning women, senior citizens without support, Dalits, and disabled people. 8.6% of the respondents stated that they are from a low-income group. Among the responders from the disadvantaged category, 39.22% are disabled, 33.3% are single-earning women, 16.67% are old citizens without assistance, and 10.78% are Dalits.

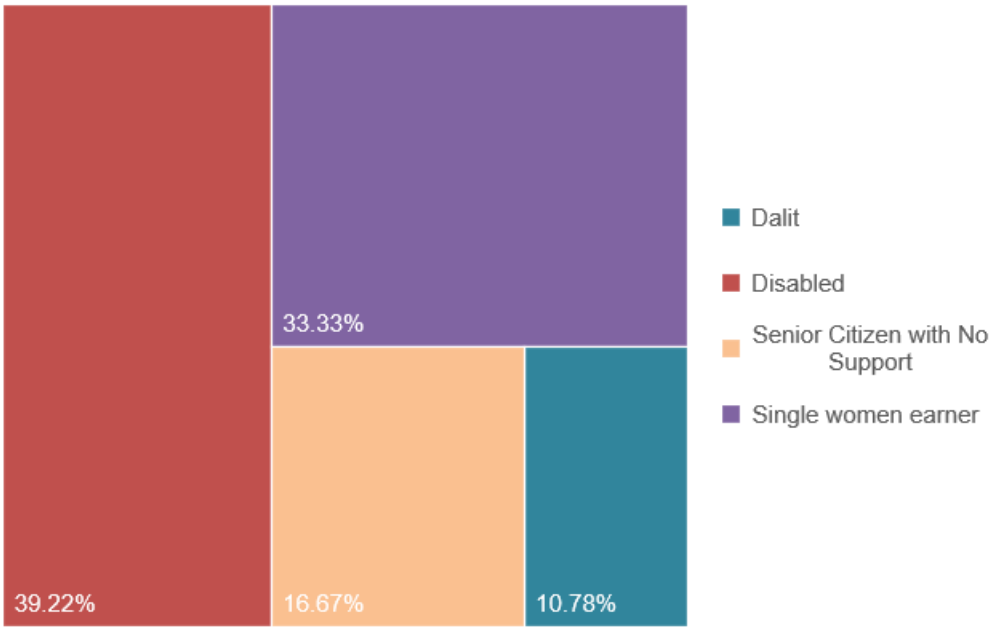


Fig: Respondents from Disadvantage Group (n=102)

During the COVID-19 pandemic, disabled persons are particularly vulnerable and afflicted. In this survey among 1186 respondents, 3.4 % said they have a disability, while 3.7 % said someone in their family has a disability. Overall, the rate of disability is 7.1%, close to the national rate of 6.94% according to the HIES-2016.

Table 5. Response on Disability

	Respondents		With Family Members		Total Respondents
Ward:	Yes	%	Yes	%	
2	6	1.3%	9	2.0%	459
3	10	3.2%	7	2.3%	308
5	24	5.7%	28	6.7%	419
Total	40	3.4%	44	3.7%	1186

3. Key Finding Analysis

3.1. Livelihood Pattern and Challenges in COVID-19 Pandemic

3.1.1. Occupation & Income

Occupation patterns are one of the major indicators of vulnerability in income and livelihood. The COVID-19 pandemic has a negative influence on income. 47% of the responders stated that their income got halted due to the pandemic. This is evident that income of government employees and doctors are not affected during the lockdown. Housekeepers, teachers, garment workers, and caretakers are less affected than others. While, prostitution, scrap collectors, and tailors are the most affected occupations.

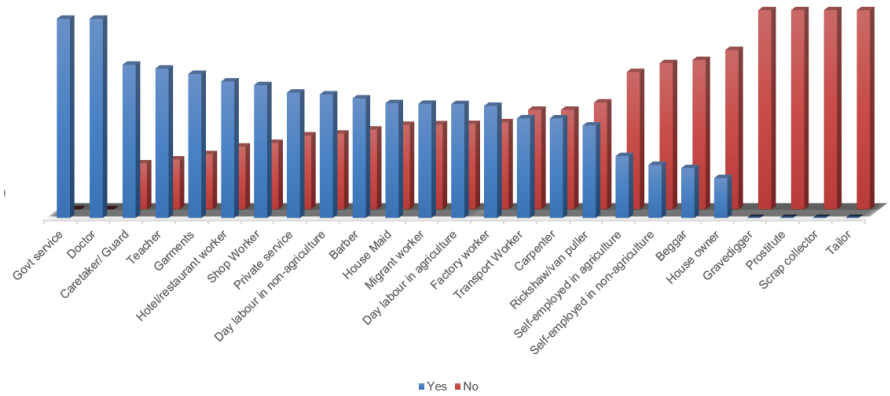
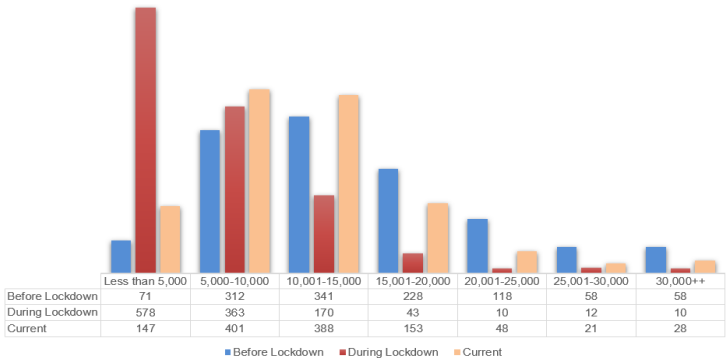


Fig: Continuation of income for different occupational categories during lockdowns (n=1186)

3.1.2. Household Income

According to the survey, the average number of earning members in the family of the respondents' household is 1.44 (1.126 males and 0.316 females). During the COVID-19 pandemic, following the lockdowns job opportunities declined, and the number of earning members fell to 1.27 (0.98 males and 0.28 females). The respondents' average monthly household income was BDT.14,254 at pre-COVID-19 stage. During the lockdown, with the declining economic opportunities, monthly earnings also dropped. The average monthly household income was reduced to BDT.5583, almost 39% drop from the pre-COVID-19 state. After the lockdown was lifted, monthly average family income increased to BDT. 11,358. But it is still lower than that of pre-COVID-19 stage. It is quite evident that the overall trend supports the theory regarding "Emergence of New Poor".



	Less than 5,000	5,000-10,000	10,001-15,000	15,001-20,000	20,001-25,000	25,001-30,000	30,000++
Before Lockdown	71	312	341	228	118	58	58
During Lockdown	578	363	170	43	10	12	10
Current	147	401	388	153	48	21	28

Fig: Monthly Income Comparison in different timeline (n=1186)

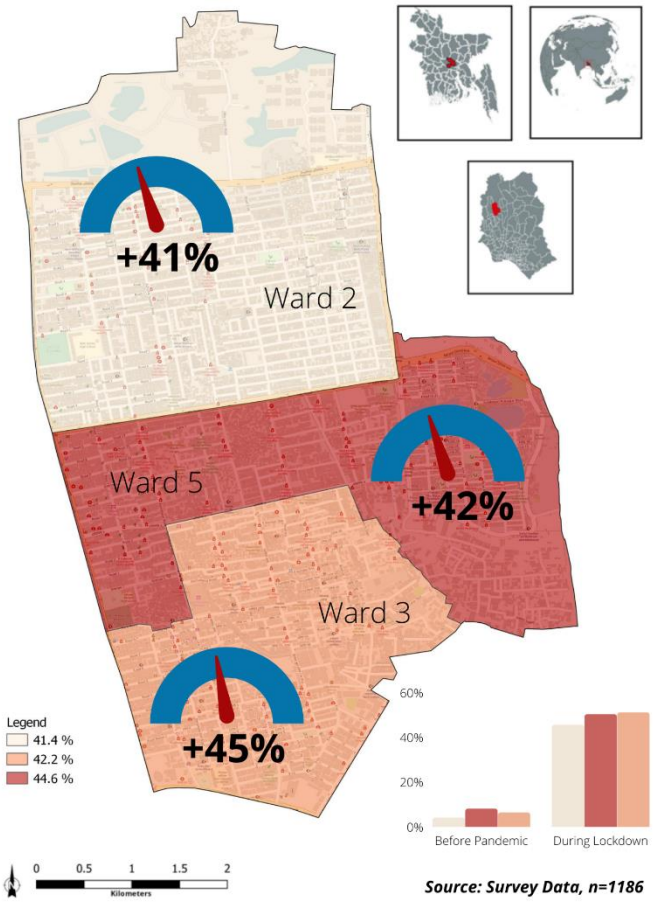


Fig: Upscaled poverty during lockdown (Monthly income less than BDT. 5000/ USD. 1.90 per day)[1]

The following tables shows the Ward wise trend of the income change in household level during different timeline:

Table 6. Monthly income Before COVID

Monthly income	Ward:			Total
	2	3	5	
Less than 5,000	19	25	27	71
5,000-10,000	114	70	128	312
10,001-15,000	147	87	107	341
15,001-20,000	79	61	88	228
20,001-25,000	59	24	35	118
25,001-30,000	17	17	24	58
More than 30,000	24	24	10	58
Total	459	308	419	1186

[1] *According to the World Bank, the extreme poor refers to people globally who live on less than $1.90 USD per day. The ultra-poor live on less than this and are the lowest-earning and most vulnerable subset of the extreme poor population (Ultra-poor Handbook, Brac/WVI).*

Table 7. Monthly income During Lockdown				
	Ward:			
	2	3	5	Total
Less than 5,000	209	155	214	578
5,000-10,000	149	94	120	363
10,001-15,000	79	32	59	170
15,001-20,000	15	12	16	43
20,001-25,000	2	3	5	10
25,001-30,000	2	5	5	12
More than 30,000	3	7	0	10
Total	459	308	419	1186

Table 8. Monthly income after lockdown lifted				
	Ward:			
Monthly Income	2	3	5	Total
Less than 5,000	48	48	51	147
5,000-10,000	126	126	149	401
10,001-15,000	170	83	135	388
15,001-20,000	70	25	58	153
20,001-25,000	22	6	20	48
25,001-30,000	10	7	4	21
More than 30,000	13	13	2	28
Total	459	308	419	1186

3.1.3. Working Days

Due to the lockdown, there has been a significant reduction in the number of days worked, which has had a direct impact on monthly income and livelihood mechanisms. The number of days worked at pre-COVID-19 stage was 27. During COVID lockdown, the average number of days worked fell to 9, and the number after lockdown is 22.6 days. Among the 1186 people who responded, 40.63% said they continued working during the lockdown. Due to a revenue shortfall, numerous employers neglected to pay salaries during the lockdown. Among the responders that are still working, 47.8% did not receive any pay during the shutdown, and 77.7% had their pay reduced as a result of the lockdown.

3.1.4. Business Activity

As per the respondents of the Socio-economic survey, during the lockdown, 54% of business owners and self-employed people continued their operations. Sales are down 46.51% from the pre-pandemic stages. In addition, according to the business KII conducted 89% responded that they had to close their operation during lockdown and only 11% could keep partially opened.

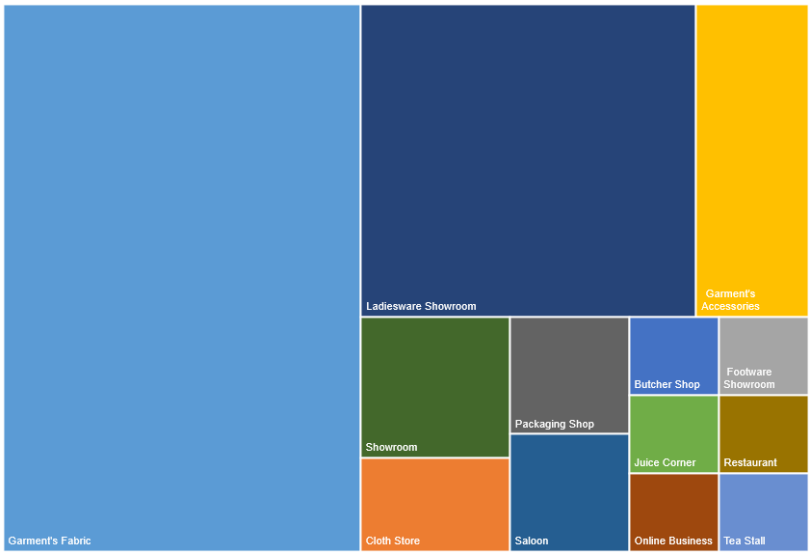


Fig: Types of Business responded to KII (n=63)

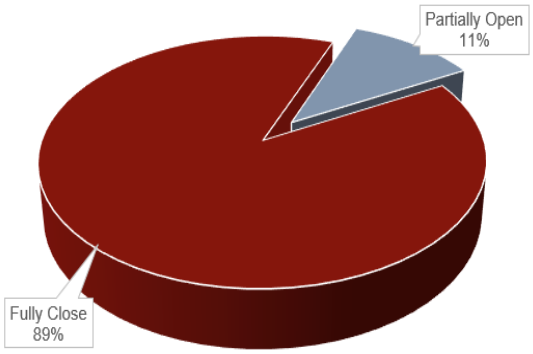


Fig: Business continuation during lockdown (n=61)

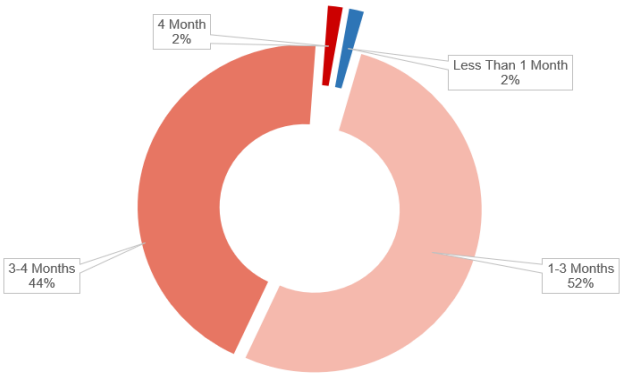


Fig: Business closure duration during lockdown (n=61)

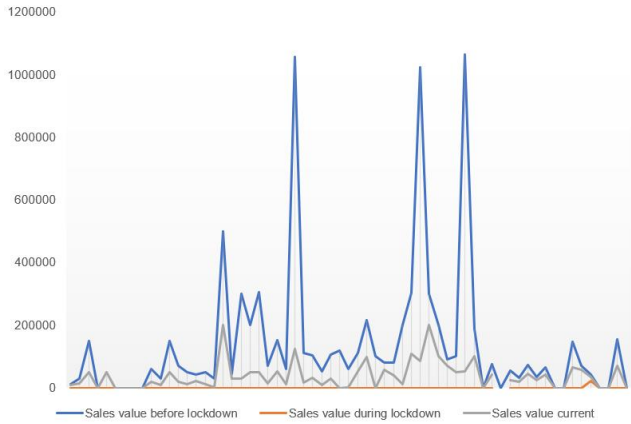


Fig: Changelog of sales at pre, during and post lockdown stages (n=63)

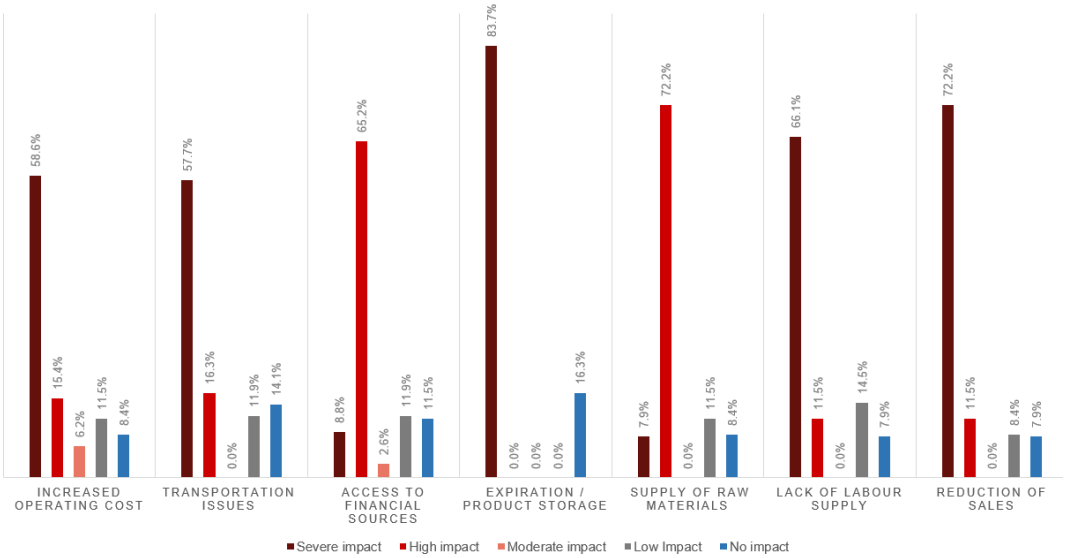


Fig: Impact trend on Business during lockdown(n=227)

Among the businesses that could continue their operations, 58.97% responded that their sales decreased significantly during lockdown. While exploring the issues the businesses faced while operational, severe impact was seen in the expiration of stored products (83.7%), reduction of sales (72.2%), lack of transportation facilities (57.7%), lack of Labor supply (66.1%) and increase in operating cost (58.6%) during lockdown. High impact was also seen in supply of raw materials (72.2%) and access to financial resources (66.7%).

3.2. Coping Mechanism

Due to COVID-19 pandemic there is an adverse effect on income and livelihood. The respondents have to cope-up with the present income and opportunity.

3.2.1. Managing Daily Expenses

Due to lowering down the income opportunity the source of managing cost was changed. Before lockdown the main source of managing daily expenses was income from salary (61.30%) and Business (25.89%). During lockdown 32.63% mentioned salary as the main source which was 61.30% before lock down. Respondents started to rely on negative coping strategies like borrowing, spending savings & taking loans. During lockdown there is a significant increase in borrowings as a source to manage daily expenses. Borrowing was increased to 26.31% during lockdown which was 3.46% before lockdown. Income from business also dropped down to 12.06% from 25.89%. People started spending their savings. Spending Savings & taking loans were increased to 9.11% and 8.85% from 0% and 1.18% respectively before lockdown.

Table 9. Source of Managing Daily Expenses - Before Pandemic					
Source	Ward:			Total	%
	2	3	5		
From salary	249	191	287	727	61.30%
From business	139	88	80	307	25.89%
Not willing to answer	42	7	18	67	5.65%
Borrowing	18	12	11	41	3.46%
Daily per hour work	1	1	13	15	1.26%
Loan	7	3	4	14	1.18%
Family support	3	3	4	10	0.84%
Help from others	0	1	2	3	0.25%
House rent	0	2	0	2	0.17%
Total	459	308	419	1186	100.00%

Table 10. Source of Managing Daily Expenses - During Lockdown					
Source	Ward:			Total	%
	2	3	5		
From salary	127	106	154	387	32.63%
Borrowing	122	75	115	312	26.31%
From business	70	45	28	143	12.06%
Savings	57	26	25	108	9.11%
Not willing to answer	54	14	37	105	8.85%
Loan	23	37	43	103	8.68%
Selling household assets	5	1	8	14	1.18%
Daily per hour work	0	0	6	6	0.51%
Selling land	1	0	3	4	0.34%
House rent	0	2	0	2	0.17%
Family support	0	1	0	1	0.08%
Wages	0	1	0	1	0.08%
Total	459	308	419	1186	100.00%

3.2.2. Savings

Due to significant decrease in income, there is an adverse effect on savings. According to the social norms of Bangladesh, people tend to have savings practices for the future. It is an alarming fact, out of the total response only 24.37% mentioned that they have savings. When the pandemic hit Bangladesh and the first lockdown started, due to the downfall of the economy, loss of livelihoods of people started which forced them to use the savings. The long-term continuation of the lockdown led to them using up all the savings and falling under vulnerable groups. The saving practices data shows how the loss of livelihoods led to no saving practices during lockdown for the majority of the respondents because they did not have a stable source of income.

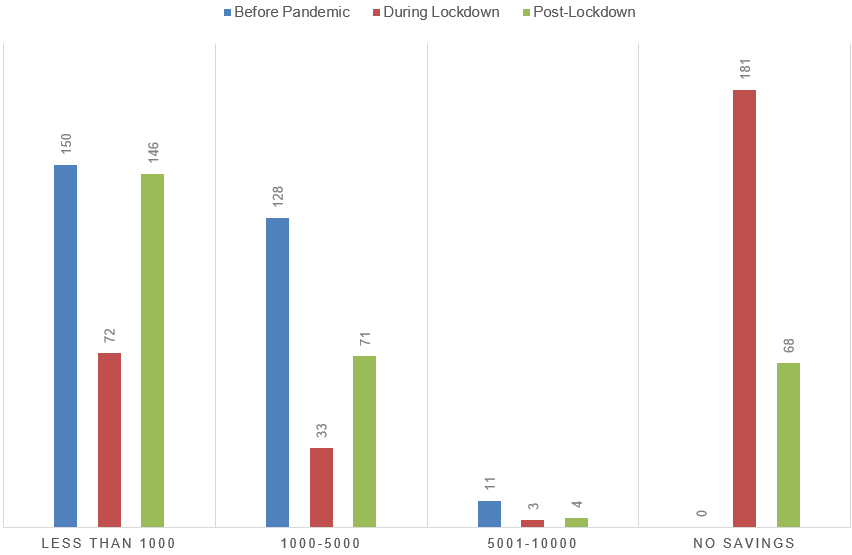


Fig: Saving trend in different timelines (n=289)

According to the survey, 63.5% entered into no savings group who were practicing saving in some value before COVID-19. This eventually made the average monthly savings dropping down to BDT.545.98 during lockdown, while it was BDT.1873.7 at pre-COVID-19 stages. With the lockdowns lifted the situation improved to BDT.1093.43, still keeping well below the pre-COVID-19 state.

3.3. Migration

As a cost cutting mechanism the low-income people tend to migrate back to their place of origin during the pandemic & lockdowns. Both long term & temporary types of migration are evident from the survey. According to the survey this migration rate among the respondents is 8%, while 19.81% of people mentioned about their acquaintances from the study area being migrated due to the COVID-19. Additionally, the Vacant household survey complemented the results, while 1761 households out of 7397 were discovered vacant and in 64% of cases the cause is related to COVID-19 induced economic disruption. Community people indicated during the FGD that as those who are living below the lower poverty line, they found it expensive to migrate as transportation was costly as well as most have already migrated to Dhaka due to pre-existing vulnerabilities and they had no support at their place of origin. They also indicated that around 30% slum dwellers migrated from their current living place and over 60% of them moved to village areas.

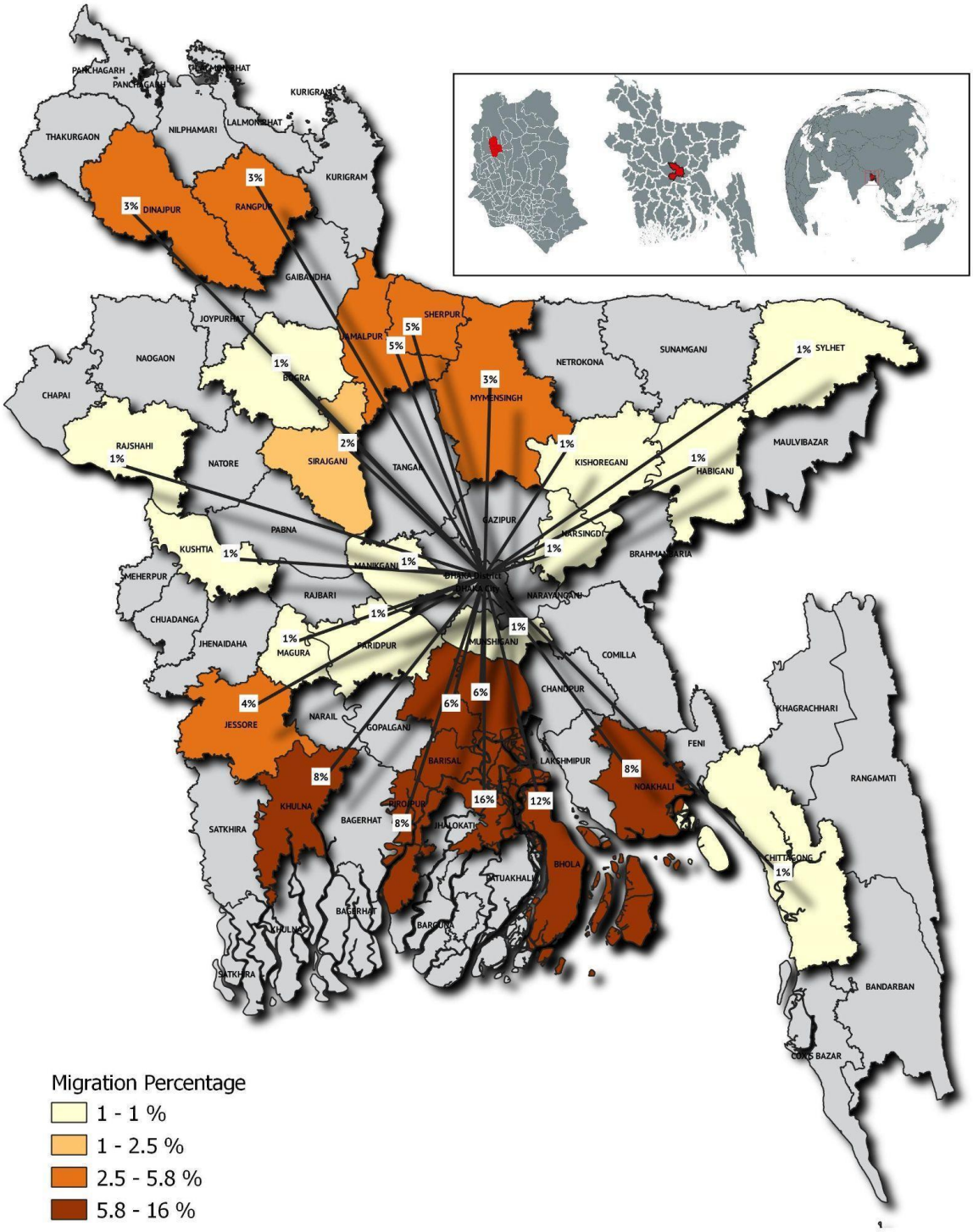


Fig: Migration Map from study area to place of origin (n=95)

3.3.1. Livelihood & Economic Shock

Among the respondents 5.62% mentioned that they migrated with their family due to lockdown. 2.8% send only their family members. Reasons varied but all seemed associated with the Economic shock following the pandemic.

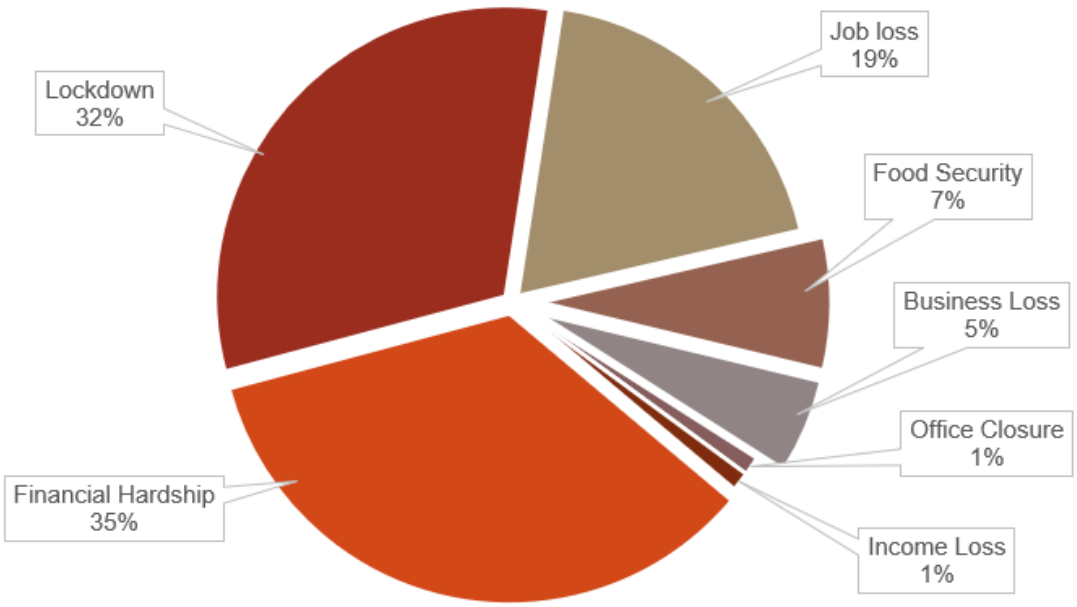


Fig: Reason behind Migration (n=95)

While interviewing the house owners, 38% and 26% of the vacancies are reported due to the COVID-19 pandemic/ lockdown and financial issues respectively. Reported security issues by 1%, and unknown by 34%, which can be classified as a usual vacancy.

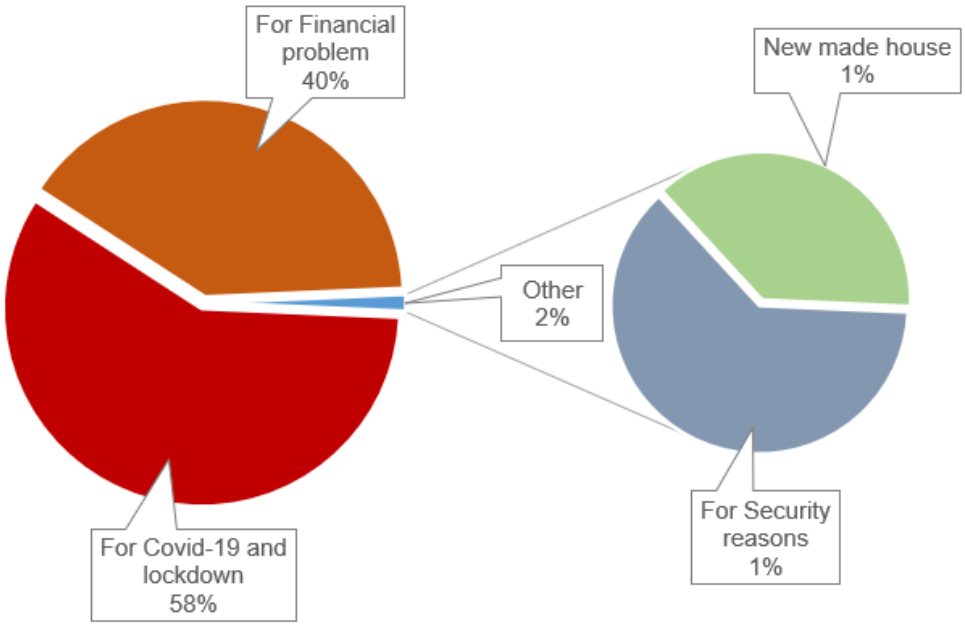


Fig: Reason behind house left vacant (n=1156)

There is a specific relationship between monthly income and migration. Migration rate is higher in low-income groups. Among the migrated respondents 62% is from less than BDT.5000 monthly income group, 26% from 5,000-10,000 income group, 9% from 10,001-15,000 and 3% from 15,001-20,000, No migration is reported from 20,001-25,000, 25,001-30,000 and more than 30,000 monthly income group.

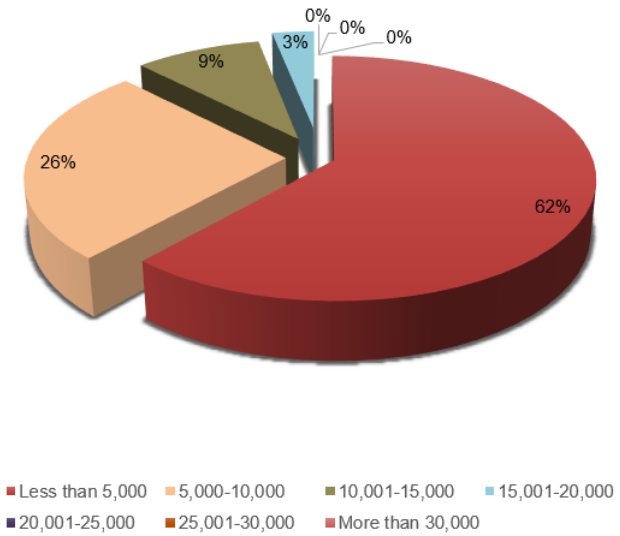
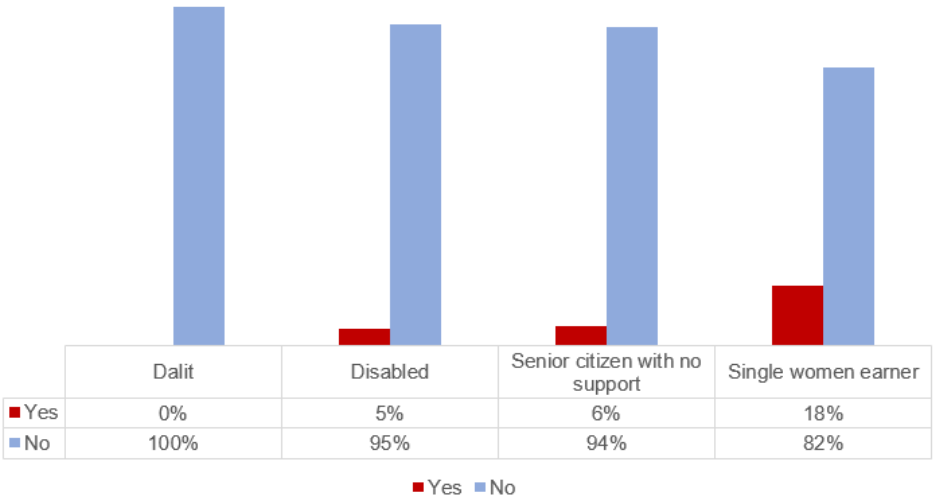


Fig: Migration pattern based on income group (n=65)

3.3.2. Disadvantage Group

The migration rate of single women earners and senior citizens without assistance is higher than that of the disadvantaged categories like Dalit and disabled people.



	Dalit	Disabled	Senior citizen with no support	Single women earner
Yes	0%	5%	6%	18%
No	100%	95%	94%	82%

Fig: Migration trend among disadvantaged group (n=102)

3.3.3. Residential Status

The study intended to explore the relationship between the migration trend and the residential status of the migrant. Only 1.54 % of those who have migrated own a house in the study area. While exploring the same status at the places the migrated back to, the response indicated 69% of the people migrated or at least send their family back don't have their own house in the areas they migrated back to. This surely is adding more vulnerability to that population.

Table 11. Migration considering current place of residents

migrate due to lockdown	Own place of residence		Rented place of residence		Total
	Number	%	Number	%	
No	173	15.84%	919	84.16%	1092
Yes	1	1.54%	64	98.46%	65
Total	174	15.04%	983	84.96%	1157

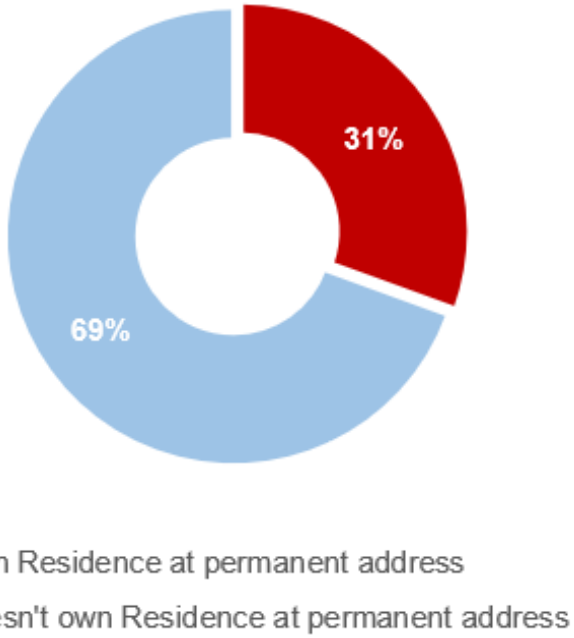


Fig: Residential status of the re-migrated population in the migrated locations (n=95)

3.3.4. Coping Mechanism

Survival is a major concern in the event of a reverse migration. Reverse migration compounds the economic vulnerabilities they faced before migrating to Dhaka in the first place. The survey brought up a number of livelihoods based coping strategies from responders who have undergone reverse migration. As a Livelihood based coping mechanism 22% relied on support from friends & family, 27% engaged in agricultural work & farming, 11% in various small & medium businesses and 5% in day labors like pulling rickshaw. A good number of respondents also relied on negative coping strategies for survival. Spending savings, taking loans from banks, NGO, and other financial institutions, personal borrowings, selling assets like lands & household animals were some of the major support mechanisms while they are staying at migrated places.

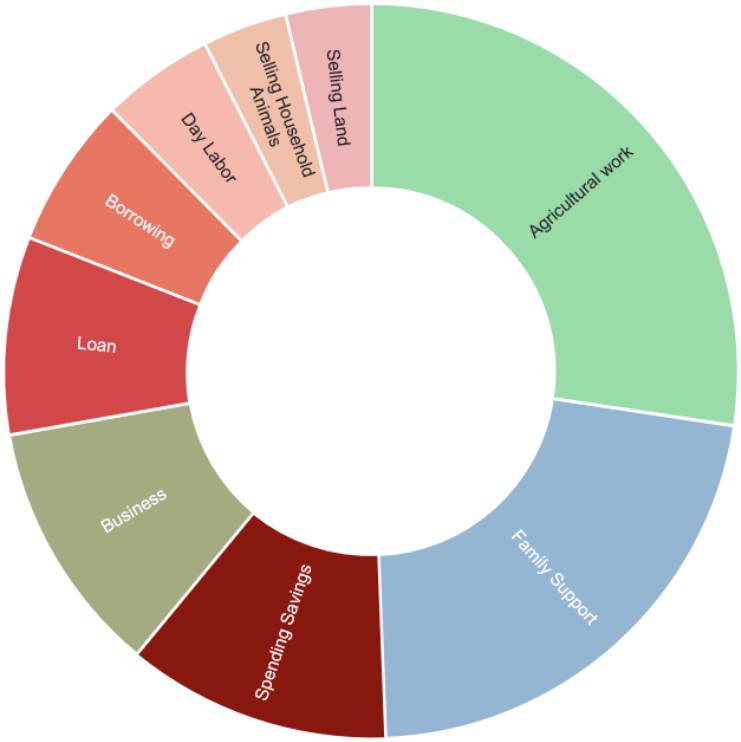


Fig: Livelihood based Coping Strategies after Re-Migrating (n=243)

4. Additional Finding Analysis

4.1. Food Security

4.1.1. Food Consumption:

4.1.1.1. Individual Food Consumption

Considering the lower income level during the lockdown food consumption scenario affected a lot. Before lockdown 88.79% respondents mentioned that they consumed three meals in a day and 9.70% mentioned four meals. During lockdown only 67.88% of respondents mentioned that they consumed three meals in a day and 0.84% mentioned four meals and the two meals increased to 30.52% from 1.10%. After the lockdown was lifted 90.05% of respondents mentioned that they consumed three meals in a day and 3.46% mentioned four meals and 6.16% mentioned two meals.

Table 12. Food Consumption - Before Pandemic

Daily Food Consumption	Ward:			Total	%
	2	3	5		
Five Meals	0	4	0	4	0.34%
Four Meals	28	37	50	115	9.70%
Three Meals	427	265	361	1053	88.79%
Two Meals	3	2	8	13	1.10%
Single Meal	1	0	0	1	0.08%
Total	459	308	419	1186	100.00%

Table 13. Food Consumption - During Lockdown

Food Consumption	Ward:			Total	%
	2	3	5		
Five Meals	0	1	0	1	0.08%
Four Meals	2	7	1	10	0.84%
Three Meals	396	210	199	805	67.88%
Two Meals	59	87	216	362	30.52%
Single Meal	2	3	3	8	0.67%
Total	459	308	419	1186	100.00%

Table 14. Food Consumption - After lockdown Lifted					
Food Consumption	Ward:			Total	%
	2	3	5		
Five Meals	0	2	0	2	0.17%
Four Meals	8	17	16	41	3.46%
Three Meals	418	277	373	1068	90.05%
Two Meals	32	11	30	73	6.16%
Single Meal	1	1	0	2	0.17%
Total	459	308	419	1186	100.00%

4.1.1.2. Family food consumption

At the same time family food consumption is also affected. Before lockdown 91.57% families used to take three meals, 7.17% four meals and 1.10% two meals in a day. During lockdown three meals intake dropped down to 63.24% and two meals increased to 33.90%. After lockdown, three meals went high with 92.75%. Of the respondents, 94.69% mentioned that there is a hike in food price and 83.90% were not able to store any food during lockdown.

Table 15. Family Food Consumption - Before Lockdown					
Family Food Consumption	Ward:			Total	%
	2	3	5		
Five Meals	0	2	0	2	0.17%
Four Meals	21	26	38	85	7.17%
Three Meals	434	279	373	1086	91.57%
Two Meals	4	1	8	13	1.10%
Total	459	308	419	1186	100.00%

Table 16. Family Food Consumption - During Lockdown					
Family Food Consumption	Ward:			Total	%
	2	3	5		
Five Meals	0	1	0	1	0.08%
Four Meals	6	15	6	27	2.28%
Three Meals	356	236	158	750	63.24%
Two Meals	95	55	252	402	33.90%
Single Meal	2	1	3	6	0.51%
Total	459	308	419	1186	100.00%

Table 17. Family Food Consumption - after lockdown					
Family Food Consumption	Ward:			Total	%
	2	3	5		
Five Meals	0	1	0	1	0.08%
Four Meals	6	13	8	27	2.28%
Three Meals	425	287	388	1100	92.75%
Two Meals	28	7	23	58	4.89%
Total	459	308	419	1186	100.00%

4.2. Access to Health services

Around 3% of total 1186 respondents mentioned that they or their family members were affected by COVID-19. Around 17% indicated that they had the capacity to bear the cost of COVID-19 treatment. 49% of the respondent's express concern that they might have to rely on borrowing and loans to manage the treatment costs while 8% said they have to spend from savings or sell household assets. Only 33% said they might be able to allocate the expenses from their salaries or business incomes. Average monthly allocation on health services before the pandemic was BDT.749.36. Declining income opportunities brought it down to almost half at BDT. 443.16 during the lockdown period.

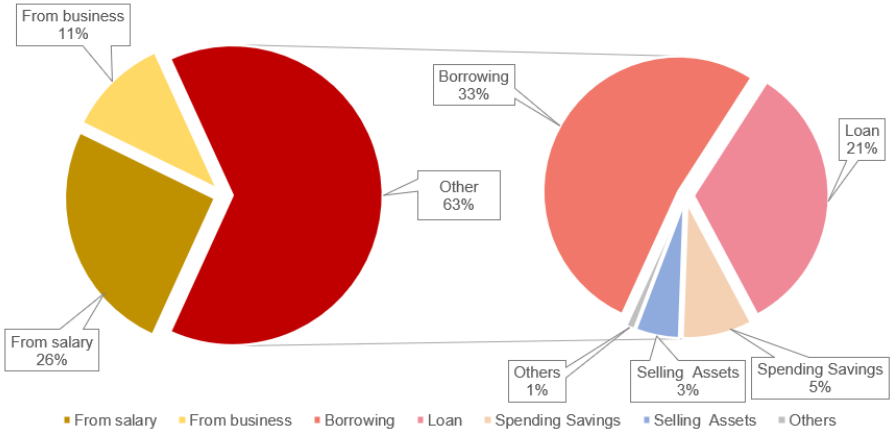


Fig: Source to capacitate COVID-19 treatment costs (n=1186)

According to the respondents, 23.74% families could not afford to support their females with menstrual hygiene materials during lockdown and even after lockdowns exposing them to Sexual & Reproductive Health (SRH) issues.

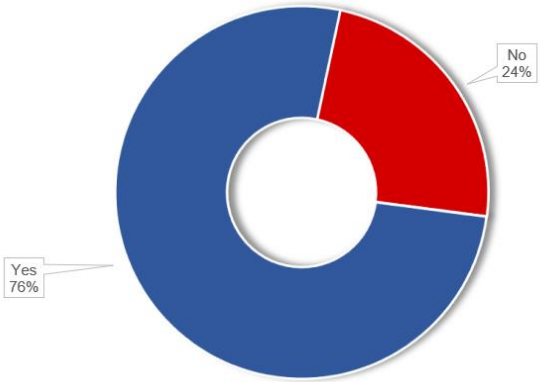


Fig: Female having access to Menstrual hygiene materials during & post lockdown(n=1150)

Almost 21% of people are dissatisfied with the health services provided by the government and the initiatives taken for prevention & control.

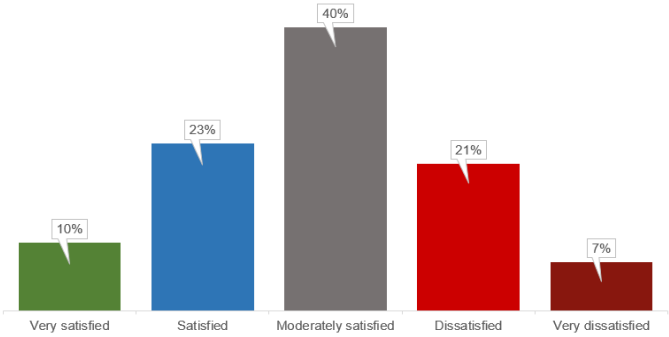


Fig: Satisfaction on Health-Related Measures Taken by the Government (n=1155)

4.3. Education

52.53% of respondents had one or more members of the family go to an educational institution before the pandemic (Avg 1.94). Among them 45% boys and 55% girls. 19 boys and 25 girls are in the school feeding program. Following the prolonged school closure 38.91% students had enrolled in online education during the lockdown. But, 43.35 % of them mentioned classes that never happened. Poor/no internet connection, unavailability of smart phone or PC and financial issues are among other reasons for the dropout.

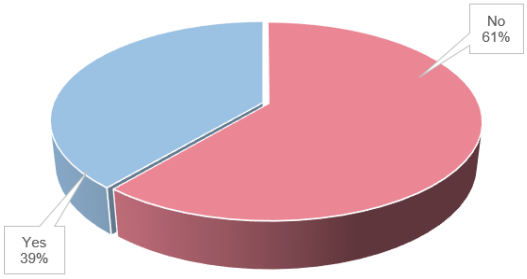


Fig: Access to online Education (n= 604)

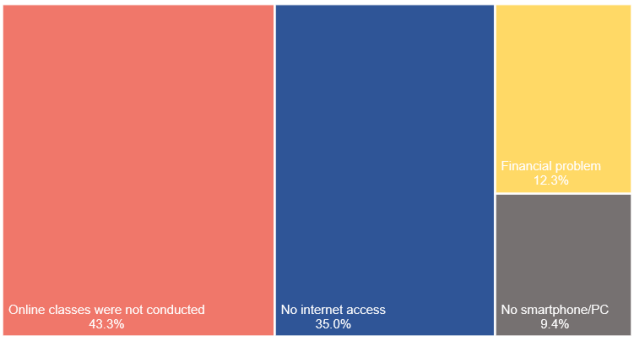


Fig: Reasons for inaccessibility to online education (n= 604)

4.4. Social Safety Net

During the initial phases of the lockdown there have been multi-phased support initiatives seen from Government, NGO's, CSO's and individuals for the LICs in Dhaka city. however, only 28.36% mentioned that they have received support during lockdown from the government or any other means. Major supporters are recorded as individuals (28%), Government (33%), NGO (30%).

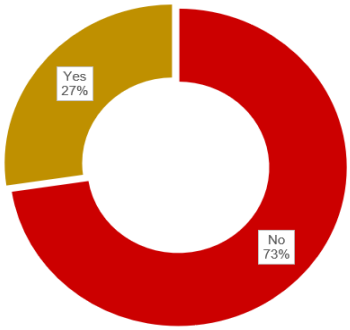


Fig: People received social support (n=1186)

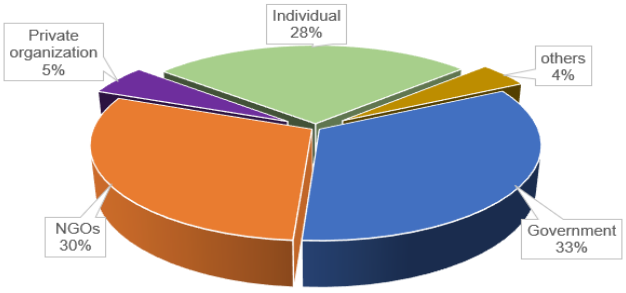


Fig: Sources of social support during lockdowns(n=483)

4.5. COVID-19 understanding and complying

The project's target population are low- and middle-income people who live in a densely populated area with a higher risk of COVID infection. In this case, understanding and adhering to COVID is important. The poll respondents are mostly from Mirpur's densely inhabited areas. As a result, there's a risk of COVID-19 outbreak. The COVID-19/ corona virus was cited by 97.39 % of those who took part in the survey.

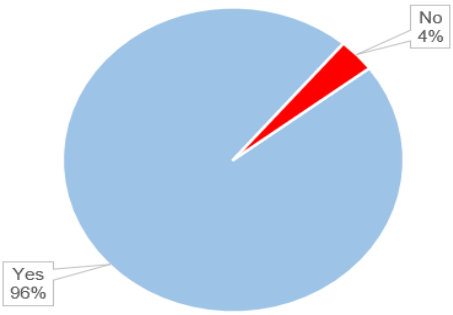


Fig: General Knowledge on COVID-19 (n=1186)

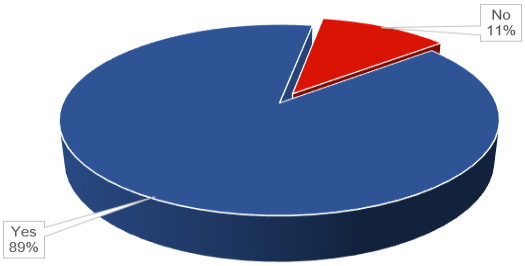


Fig: Following general COVID-19 safety rules (n=1186)

Information about the hospitals & health facilities with COVID-19 treatment facilities is crucial for those who have been impacted and living in areas with high risk of infection. The location of COVID-19 hospital and treatment facilities is unknown to 59.27% of responders. Due to the government and other COVID awareness activities respondents have ideas about the basic norms to prevent themselves from COVID infection. 88.6% respondents mentioned that they follow the rules to be maintained.

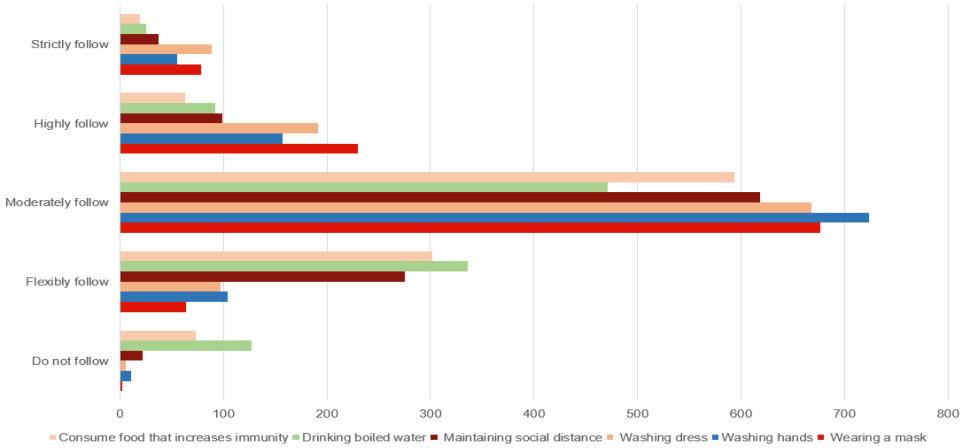


Fig: Trend of following different COVID-19 hygiene practices among respondents (n=1186)

84% mentioned that they do not have any problem maintaining the health and hygiene norms during COVID-19 pandemic.

5. Recommendation

- Comprehensive research in the area where the target beneficiaries re-migrated is essential to achieve thorough and suitable migration mapping.
- Where the target beneficiary has returned back to, livelihood measurement and coping mechanisms trend and assessment of the existing capacity of the re-migration areas are critical.
- This baseline survey does not address the challenges that the intended target groups faced prior to their first migration to Dhaka that should be analyzed.
- Reverse migration will exacerbate the issues they had experienced before their first journey to Dhaka. So, it's important to figure out why people migrate in the first place and what obstacles reverse migration may bring.
- A good proportion of workers from informal sectors lose their jobs in such shocks & events. These unemployed working populations need to be redirected towards alternative livelihoods and skills development opportunities in order to ensure their sustenance in the short to medium term.
- The government should work closely with development agencies/NGOs/stakeholders and collaborate based on specialization to cater to immediate needs of the vulnerable population. NGOs with in-depth experience in the specific population within the geo boundaries and of supporting ultra-poor populations during natural calamities, should be reached & engaged to have leverage for designing effective national level livelihood interventions.

6. Conclusion

Considering the findings, it is clear that the low-income group (Urban poor) have chosen to reverse migration as one of the coping mechanisms against the economic & livelihood disruptions during the pandemic. The indication of Reverse migration kept exacerbating the issues even when they went back to the places from where they had migrated from is also observed. Concerns are there whether the places they migrated back to have built the support infrastructure for the alternative livelihood since they left or not. It is also important to figure out why people migrate in the first place and what obstacles reverse migration may bring. Findings from this report might influence the initiation of the discussions for the mitigation strategies long way ahead.

7. About the Project

7.1. C2M2 Program

This project is one of 12 city-based projects, connected regionally and globally through the Cities' COVID Mitigation Mapping (C2M2) program supported by the U.S. Department of State. The Cities' COVID Mitigation Mapping program (C2M2) builds on global networks of geospatial experts to analyze second-order impacts of COVID-19. The goal of this program is to increase the capacity to understand the distribution and gaps in resources available to vulnerable populations in urban communities. Designed by the Mapgive Initiative and the Office of the Geographer the C2M2 program aims to expand global geospatial partnerships and capacity building to effect COVID-19 second order impacts in vulnerable communities. This program has three regional hubs in Africa, Asia, and Latin America, where selected local organizations, with regional geospatial and community development expertise, identify and work with various local project partners to develop and guide C2M2 projects in each region.

C2M2 projects build local capacity to utilize open data and geospatial technologies, strengthen international partnerships, and create new data and analyses to inform data-driven decision making for planning to mitigate COVID-19 second-order impacts. Project partners focus on key themes: food security, informal economy, tourism, health, and mobility to address second-order impacts of COVID-19. Each project is facilitated by one of three regional hubs assisted by the American Association of Geographers (AAG), to build local capacity for using geospatial technologies, strengthen partnerships, and create new data and analysis to understand resource distribution and gaps. Projects generate data and analytic products to share openly within the community to support data-driven decision-making for economic and social needs.

7.2. The Bangladesh Team

The C2M2 Bangladesh Team represented by Bangladesh Open Innovation Lab (BOIL) is leading the Dhaka city project, with guidance from The C2M2's "Asia Hub" responsible for the South Asia region. In Dhaka, the city project studies the internal migration of economically vulnerable populations to coastal & climate vulnerable regions.

BOIL is a real-life test and experimentation environment for user-driven open innovation. BOIL enables the co-creation of user-driven and Open Data based research, development and innovation of technologies, products and services focused on the well-being of people. BOIL will also apply user-driven innovation in policy making by integrating the OpenStreetMap platform, open spatial data, non geo spatial data, open government and non-government data produced by different government and non-government agencies. With a vision to build a community that supports the Open Data and uptake of the Living Lab paradigm and empowering everyone to innovate, BOIL focuses on collecting information and achieved experiences on community issues all over Bangladesh and bring the information on the open platform in spatial and non-spatial manner to enhance the coordination among the concerned agencies as well as the cross boundary. It provides consultancy and support in the field of education & capacity development in open geospatial technology; data collection, data mining & survey; data management & analysis; digital innovation and Information technology-based solution & research; and assists the smooth implementation of different projects of development & humanitarian sphere.

https://mapgive.state.gov/c2m2

CITIES COVID-19 MITIGATION AND MAPPING

Final report

Public Lab Mongolia

December 2021
Ulaanbaatar, Mongolia

MAP GIVE

Cities' COVID-19 Mitigation Mapping (C2M2)

"The Cities' COVID Mitigation Mapping (C2M2) program is part of the MapGive Initiative in the Office of the Geographer at the U.S. Department of State that builds partnerships to enhance geospatial capacity, generate data, and share maps to support planning for mitigating COVID-19 second order impacts. We acknowledge the many partners who make this a successful program."

PUBLIC LAB MONGOLIA

CULTIVATING HEALTHY ENVIRONMENT & RESILIENT COMMUNITIES THROUGH OPEN DATA

Public Lab Mongolia was founded in 2018 because we saw the need for a voice that advocates for a meaningful collaboration among stakeholders such as civil society, academia, government and the media. We work to promote the culture of open data so that different actors, leaders and communities can address the environmental and public health challenges of today and tomorrow by engaging in informed and inclusive discussions.

Our mission is to cultivate a healthy environment and resilient communities through open data. We work to foster data-based decision-making and increase youth contribution in achieving sustainable development goals via open data by creating and improving data on environment, and environmental health issues.

This report was written by Enkhtungalag Chuluunbaatar
Maps developed by Erdenetsogt Sumiyasuren, Byambatsetseg Lkhagvasuren
Content contributions by Nyamsuren Tsadmid

KLL Kathmandu Living Labs

KLL is a leading civic-tech company based out of Nepal. Founded in 2013, primarily, to advance the Open Mapping movement, we have trained and engaged thousands of people from Nepal and other Asian countries in mapping their local communities in OpenStreetMap (OSM). The massive 7.8Mw Nepal earthquake in 2015 was our testimony which we successfully fared. We coordinated both the global and local mapping work, and connected it to the lifesaving on-the-ground needs. It is recognized as one of the most successful use cases of Open Mapping in disaster response so far.

TABLE OF CONTENTS

C2M2 ULAANBAATAR PROJECT IN NUMBERS

362,526
total COVID-19 cases (Nov 1,2021)

1,672
total COVID-19 deaths (Nov 1,2021)

68.5%
fully vaccinated (2 doses) (Nov 1,2021)

55.5%
COVID-19 patients in Ulaanbaatar

193
days of field work

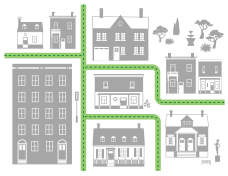
884 + 859
hospitals collected in Ulaanbaatar + 21 provinces, 330 subprovinces

1004 + 792
pharmacies collected in Ulaanbaatar + 21 provinces, 330 subprovinces

250+
volunteer mappers trained on OpenStreetMap

30+
Mapathons organized on OpenStreetMap

200,000
buildings mapped in OpenStreetMap



7,600
km of road mapped in OpenStreetMap

3.5
million total edits made in OpenStreetMap

12
stakeholder events and workshops organized

309
stakeholder and participant engagement

48%
women and girls engaged

WHY C2M2 PROJECT IN MONGOLIA?

It began with a story. A story that is all too common, and all too familiar. The stories about the trails and tribulations about accessing the health and medical services that people need. In Mongolia, word-of-mouth is the way most people go about finding a health or medical service they are looking for - ask your family, friends, colleagues, friends' colleagues, in-laws second cousin's co-worker etc.,

It is because there is no one place where people can search, browse, find and compare health and medical service options. Online search can be futile as up-to-date, complete and reliable information about health services are far-in-between. What turns-up is mostly social media pages that paint partial picture about the legitimacy, reputation and even contact information about the health service.

Further, partly because most people are uninformed about how to go about accessing public health services, and partly because public health services are overstretched and the wait is long, there is an air of dread about the idea of going to a health facility, especially public and higher tier medical services. This means, private providers that cost more.

Many choose to lose time by putting off health consultation, follow-up work up, doctor's visits, and treatment plan at the face of lack of and access to information.

The consequence is delayed doctor's visit, diagnosis, and therefore treatment.

The Covid-19 pandemic has and still is severely challenging the health systems around the world. Mongolia, faced with full-blown community outbreak of the Covid-19 virus would not be an exception. The challenges that existed before the pandemic would only widen the gap and worsen the access to essential health and medical services.

The C2M2 Ulaanbaatar project was conceived to mitigate the secondary health impacts during the Covid-19 pandemic. The project aims to address the key problem in health service access by creating one simple tool that would equip the public in quickly and easily finding the information they need so that they can access the health services they need.

C2M2 ULAANBAATAR PROJECT GOALS

The C2M2 Mongolia project is focusing on reducing the second-order health impacts due to the Covid-19 pandemic for the vulnerable population of Ulaanbaatar city. The project aims to identify high risk areas and facilitate health service access for the residents of the capital city, more specifically, for the ger area residents.

The project aims to facilitate these issues for the ger area residents through vulnerability assessment and information access. Vulnerability assessment will identify communities that are at high-risk during Covid-19, and identify existing service gaps for local decision-makers to consider to reduce impacts.

Facilitating information access about available health services through easy-to-use platform and mobile application will help ger area residents to be able get health services without delay.

The project's information portal and application will not only reduce second-order health impact during the pandemic for ger area residents, but also improve health service information access for the entire population beyond the project implementation.

The C2M2 Ulaanbaatar project objectives include:

1. Health service information portal and mobile app
2. Vulnerability analysis of Ulaanbaatar settlement areas
3. Improved OSM data for Ulaanbaatar

The following main activities were undertaken within the project:

1. Data component include data review, existing data collection, field data collection, data compilation, data cleaning, data verification, data entry and improving OSM data for Ulaanbaatar.
2. Health service information portal development by Kathmandu Living Labs IT team, feedback collection and revision.
3. Vulnerability analysis component include collecting relevant data, data cleaning, developing analysis maps.
4. Awareness component include social media campaign, stakeholder awareness event, and creation of short video series.

COVID-19 STATUS IN MONGOLIA

LEVEL-4: VERY HIGH LEVEL OF COVID-19 IN MONGOLIA

Mongolia remained COVID-19 free until November of 2020, except for the imported, controlled cases. Since the first community outbreak of the COVID-19 virus, the number of cases soared and continues to climb despite the high vaccination rate in the country.

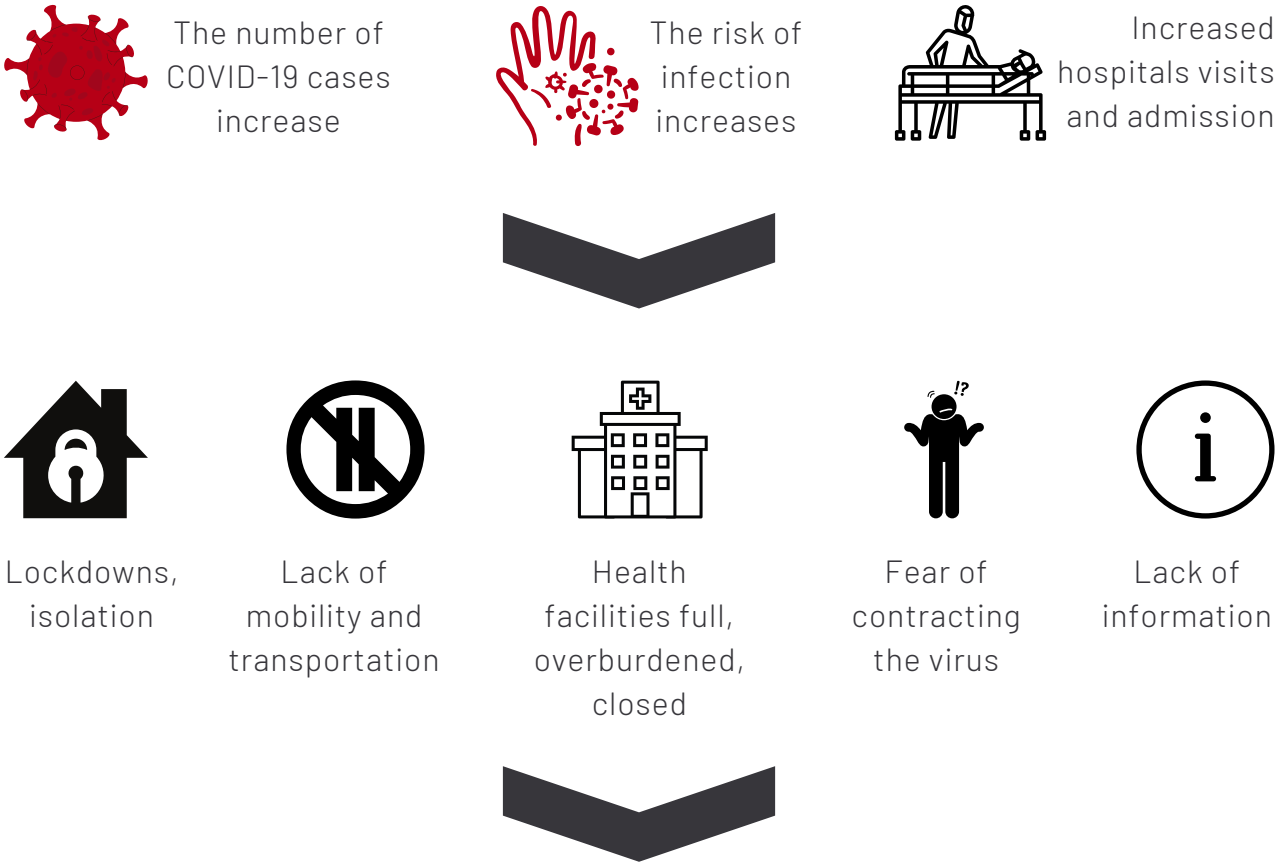
The following table compares the COVID-19 statistics in Mongolia during the ten months period between January 1st, 2021, and November 1st, 2021:

Indicator	Jan 1, 2021	Nov 1, 2021
Total number of active COVID-19 cases	1,220	362,526
Recovered	837	585,997
Imported	488	0
% of cases in Ulaanbaatar	34%	55%
Total number of COVID-19 deaths	1	1,672
% of cases in Ulaanbaatar	100%	N/A
cumulative per million	0.3	550
Total number of COVID-19 patients hospitalized	373	16,451
Critical	0.5%	2%
Severe %	1.6%	12%
Moderate %	27.9%	40%
Mild %	70%	46%
Total number of pregnant women hospitalized for COVID-19	N/A	904
Total number of children hospitalized for COVID-19	N/A	3,532
Total number received 1st dose of COVID-19 vaccine	0%	2,256,273 or 69.4%
Total number received 2nd dose of COVID-19 vaccine	0%	2,142,083 or 65.8%
Total number received 3rd dose of COVID-19 vaccine	0%	454,155 or 14%

There is very little data, if any, in terms of sizing up the quantifiable impact of change in level of access to health and medical services during the COVID-19 pandemic. In December 2020, one in three Mongolians who needed health or medical services did not receive it. As of October 2021, one in five people who needed health and medical services did not receive it. The reasons for this inaccessibility to health and medical services include fear of contracting the virus, health and medical facilities being full and lack of transportation or means of mobility.

We expect that the financial access to health and medical services have declined due to overall decline in income as well as increase in price of stable food products, especially for low-income households. News reports also indicate closures of various non-COVID-19 related health and medical services such as rehabilitative services, urgent care, oncology etc.,

Unfortunately, there is no comprehensive data which documents the changes in the level of access to health and medical services and its impact on the population. Anecdotally, several deaths and numerous stories of challenges in health service access have been reported as caused by inability to access emergency or other medical services due to lockdown measures, physical or geographic distance and other COVID-19 policies.



COVID-19 TIMELINE AND KEY EVENTS

Reported COVID-19 active cases, deaths, vaccination rate

Observed impacts:
January-June, 2020

- Significant impact on economic activity and household income especially in service, agriculture, herding, and tourism industries.
- Food and income insecurity severe in low-income households.
- Health access remain largely undisrupted.
- Thousands of Mongolians stranded abroad protest to demand entry into the country outside Mongolian consulates around the globe.

JAN, 2020 — 0.0 / 0.0 / 0.0

Mongolia closes border with China, COVID-19 task force assembled.

JAN 26, 2020

Schools and kindergartens close effective immediately until March 2 to prevent an outbreak. Schools and kindergartens close and distance learning is implemented. Distance learning has been challenging for teachers, parents and students especially. Children who do not have reliable access to internet, computer are lagging behind.

MAR, 2020

Mongolia closes borders, suspends all commercial flights and organizes charter flights.

MAY 18, 2020

The World Bank releases plans to support the government's economic relief package, namely covering social security contributions of 120,000 individuals for 5 months.

MAY 26, 2020

To date, 11,275 Mongolians abroad have requested to return home from 46 different countries, as anger mounts over Mongolia's extended border closure. More than 8000 individuals have been repatriated on chartered flights and vehicles.

JUNE 2, 2020

COVID-19 safety measures concerning campaigning and voting are approved for Parliamentary elections during a cabinet meeting.

JUNE 22, 2020

The first-ever direct flight from Mongolia to the US lands in Seattle, carrying a donation of PPE worth USD 1 million for the US Government.

JUNE 23, 2020

The ADB approves a loan of USD 26.4 million to temporarily expand unemployment benefits, food stamps, and the child money program to alleviate the socioeconomic impacts of the virus.

JUL, 2020

National summer festival Naadam is held virtually, with travel restrictions in place.

JUL 20, 2020

In July 2020, a total of ten charter flights were scheduled to bring close to 2000 Mongolian citizens back home. Since the air border closed in January, Mongolian Airlines has flown to 44 countries to bring back 67,290 citizens.

Observed impacts: July-December, 2020

- Until November 11, there was no confirmed community outbreak and all Covid-19 cases have been imported. This meant life was largely back to normal in the country with exceptions of economic impacts, social distancing and mask wearing. Since the confirmed cases of community outbreak, very strict travel restrictions, lockdowns and curfews have been imposed. These measures negatively impacted businesses, mobility and access to essential services such as health and medical services.

AUG 17, 2020

The COVAX Facility works to accelerate the development and distribution of COVID-19 tests and vaccines. Mongolia has been included in the list of countries to receive support under COVAX for equitable vaccine distribution.

SEP 04, 2020

The $1.5 million grant will be sourced from the Asian Pacific Disaster Response Fund and will help improve medical resource supplies, including diagnostic kits and PPE.

SEP 14, 2020 311 / 0.0 / 0.0

Public events and educational institutions have been approved to return to normal operations throughout September. However, borders will remain closed at least until October 31.

OCT 01, 2020 313 / 0.0 / 0.0

The "Building the Capacity for COVID-19 Diagnosis and Service Delivery for the Most Vulnerable in Mongolia amidst the Pandemic" project launched to enhance the capacity of the health sector, diagnostics, and primary health care units.

OCT 09, 2020 315 / 0.0 / 0.0

Over talks between Mongolian-Japanese relations, the Japanese Minister of Foreign Affairs announced a JPY 25 billion loan to Mongolia toward its COVID-19 response efforts.

OCT 26, 2020 340 / 0.0 / 0.0

The State Emergency Commission extends the nationwide border closures until December 31, 2020. Movement across all road, air, and railway borders will continue to be restricted and closely monitored.

NOV 11, 2020 382 / 0.0 / 0.0

First two community outbreak cases of Covid-19 confirmed, prompting emergency lockdown. Special Emergency Committee declares emergency curfew.

NOV 12, 2020 412 / 0.0 / 0.0

In November, more than 1,900 people were scheduled to be flown home on 10 special mission flights. However, due to the recent outbreak, the remaining seven flights scheduled for this month were cancelled in accordance with the instructions given by the Deputy Prime Minister.

To restrict unnecessary travel, all trips except to grocery stores nearby are subject to interrogation.

"Shuurkhai 119" smartphone application launches: With this application, Mongolian citizens can directly contact the COVID-19 reference center and receive advice and information for free from anywhere in the world.

NOV 16, 2020 473 / 0.0 / 0.0

18 locations to perform covid tests for free in Ulaanbaatar
Two types of tests are being used to validate cases: rapid antigen and PCR.

NOV 13 - DEC 17, 2020 923 / 0.0 / 0.0

National strict travel restrictions, curfews, and lockdowns are imposed. Private vehicles are prohibited. Public buses far in-between. Intercity entry and travel is ceased which caused several deaths due to the inaccessibility to health and medical services in Ulaanbaatar.

NOV 19, 2020 557 / 0.0 / 0.0

Cabinet Announces Pandemic Outbreak Measures and passed various precautionary and relief measures following the first local transmission. These include tax breaks, prolonged border regulations, and support for businesses and industries.

NOV 23, 2020 672 / 0.0 / 0.0

Kindergartens, schools and universities to continue virtual lessons until the end of Fall term.

DEC 1, 2020 812 / 0.0 / 0.0

Mongolia's COVID-19 Surveillance website has been launched - website had been made using open source as part of AND Global's corporate social responsibility.

DEC 13, 2020 812 / 0.0 / 0.0

State takes responsibility over electricity, heating, water and waste payments. With the exception of nine sectors, businesses have zero electricity, heating, steam, water and waste bills. Households with up to 100 square meters will have zero heating bills. If it is more than 100 m / sq, you will have to pay for the remaining m / sq.

Observed impacts: January, 2021

- The resignation of high-level government positions adversely affect the governance of the COVID-19 pandemic in the country.

DEC 14, 2020 918 / 0.0 / 0.0

ADB Releases $60 Million for Air Quality Improvement Program in UB

DEC 22, 2020 1,006 / 0.0 / 0.0

Ulaanbaatar is under strict lockdowns again after only five days due to rapid rate of new daily infections

JAN 12, 2021 1456 / 1.0 / 0.0

Strict lockdown and travel restrictions are lifted in Ulaanbaatar, while social distancing and limit on gathering of more than 10 people enforced. First officially reported COVID-19 death recorded.

JAN 20, 2020 1,584 / 1.0 / 0.0

Mongolians protest urging the State Emergency Commission to resign. Mongolian citizens assembled in a peaceful protest at the Sukhbaatar square in Ulaanbaatar, urging the State Emergency Commission to resign for gross mistreatment of a new mother diagnosed with COVID - 19.

Deputy Prime Minister Ya.Sodbaatar, who also serves as Chair of the State Emergency Commission, and Minister of Health T.Munkhsaikhan announced that they are submitting their resignation to the Prime Minister.

Head of Ulaanbaatar's Health Department dismissed. The Mayor of Ulaanbaatar issued an ordinance after receiving Head of Ulaanbaatar Health Department L.Tumurbaatar's resignation

Observed impacts: January-June, 2021

- Mongolia continues to see high daily, new Covid-19 cases including Delta variant of the coronavirus, despite high rates of double dose vaccinations.
- Economic burden is heaviest on business owners, especially service and tourism as well as among low-income households.
- Public confidence in pandemic governance is weak. Protests by the general public and health workers have been taking place.

JAN 21, 2021 — 1,592 / 1.0 / 0.0

Nyamkhuu Dulmaa dismissed from his role as head of the National Center of Communicable Diseases following the protest.

JAN 27, 2021 — 1,692 / 1.0 / 0.0

Tuberculosis doctor and epidemiologist D.Naranzul was appointed as the new president of the National Center for Communicable Diseases.

JAN 29, 2021 — 1,742 / 1.0 / 0.0

The State Central Second Hospital's president Enkhbold Sereejav was appointed as Mongolia's new Minister of Health.

FEB 08, 2021 — 2,174 / 2.0 / 0.0

'One door-one test' to be conducted during strict quarantine period in Ulaanbaatar from February 11 to 23, the government plans to do a PCR test on one member from each household in the city.

FEB 10, 2021 — 2,174 / 2.0 / 0.0

National-level lockdown, travel restrictions, curfews are imposed.

FEB 15, 2021 — 2,416 / 2.0 / 0.0

Mongolia will administer COVID-19 vaccines beginning on Feb 23, 2021

FEB 27, 2021 — 2,907 / 4.0 / 0.0

Mongolia received 10,000 doses of Russia's Sputnik V vaccine and the next 10,000 doses are planned to arrive in the first week of March

MAR 07, 2021 — 3,336 / 4.0 / 0.0

New COVID - 19 cases were detected in Arkhangai aimag, Tuv aimag, and Zavkhan aimag from March 4th through March 7th.

MAR 08, 2021 — 3,481 / 4.0 / 0.0

108 new cases were detected in Mongolia after testing 13,269 people nationwide within 24 hours. This is the highest number of cases detected in a single day since the first domestic coronavirus transmission in the country.

MAR 19, 2021 — 4,976 / 5.0 / 171,949

Mongolia begins treating mild COVID-19 cases at home as hospital capacities reach their limit.

APR 08, 2021 — 14,183 / 19 / 529,911

National-level lockdown, travel restrictions, curfews are imposed. Mongolia received 25,740 doses of the Pfizer vaccine; more will come in May.

APR 23, 2021 — 29,219 / 74 / 169,187

The cabinet convened for an irregular meeting and decided to extend the current state of 'all-out preparedness' and associated strict lockdown measures until 6 AM on May 8.

Observed impacts: May-June, 2021

- One in three Mongolians are unable to access health and medical services. Daily cases of COVID-19 continue to soar after a period of decline during lockdown.

July, 2021

- About 150 herders protested on horseback in front of the parliament to advocate organizing Naadam festival.

Observed impact December, 2021

- One in five Mongolians are unable to access health and medical services. Daily cases of COVID-19 continue to soar after a period of decline during lockdown.

MAY 06, 2021 — 43,201 / 142 / 53%

Prime Minister L.Oyun-Erdene announced that every citizen will receive a one-time grant of MNT 300 ,000 as part of the lockdown relief initiative.

MAY 21, 2021 — 51,247 / 240 / 77%

Presidential election campaign starts.

MAY 22, 2021 — 52,470 / 244 / 78%

Prime Minister L.Oyun-Erdene announced that every citizen will receive a one-time grant of MNT 300 ,000 as part of the lockdown relief initiative.

JUNE 16, 2021 — 85,770 / 389 / 101%

Naadam will be held without an audience in Ulaanbaatar. It will not be organized in the countryside. COVID-19 cases continue to soar following elections

JULY 02, 2021 — 122,770 / 592 / 116%

#NoNaadam: Mongolians were able to protect their rights. The Cabinet officially announced to postpone the National Naadam Festival for one year. The NoNaadam campaign had been advocating for the decision as a result of rising cases and deaths. The NoNaadam rally adjourned following the decision.

JULY 20, 2021 — 152,544 / 745 / 1ST - 65%; 2ND - 57%

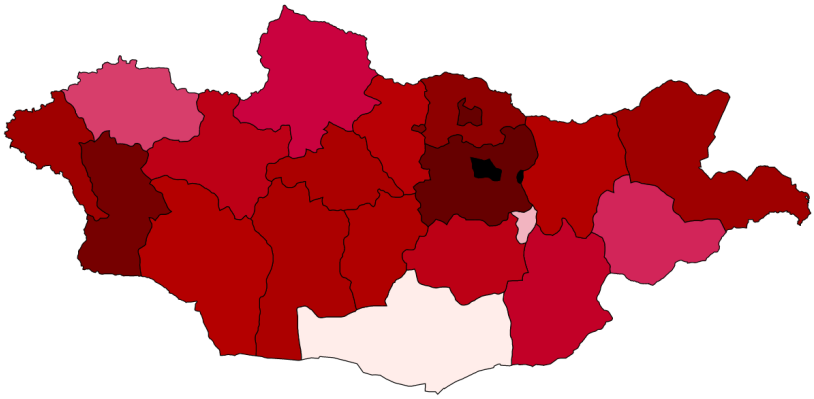
The Minister of Health announced that the delta variant of the coronavirus has been registered in Mongolia and called on citizens to adhere to the infection control regime.

JULY 22, 2021 — 153,787 / 755 / 1ST - 65%; 2ND - 58%

The purchase of Pfizer vaccines will continue until the end of the 3rd and 4th quarters of this year. With these and future doses, more than 290,000 children aged 12-17, pregnant women, and other unvaccinated people will be able to get the vaccine

JULY-NOV 30, 2021 — 383,270 / 1,930 / 1ST - 70%; 2ND - 66% 3RD- 20%

The daily new cases of the COVID-19 virus continue to climb despite a high vaccination rate. The number of active COVID-19 cases double in three months between Jul-Oct. Health and medical services accessibility is limited due to full facilities, limited human and other resources.



REPORTED CASES AND IMPACTS ON HEALTH AND MEDICAL SERVICE ACCESS

December, 2020: "1 out of 3 who needed medical treatment did not receive services, mainly due to people's concerns of contracting the virus and mobility restrictions" (Source: World Bank Household Survey)

December 8, 2020: A woman from Arkhangai province dies at the Ulaanbaatar city's border due to travel restrictions and being unable to access emergency medical care. (Source: http://time.mn/piD.html)

January 8, 2021: A woman needing post-operative treatment is unable to get the health/medical care needed at the public hospital due to COVID-19 outbreak at the facility. The family could not afford private medical care.

January 21, 2021: A new mother and her newborn were promptly taken out of the maternity hospital under less than ideal conditions after she was confirmed to be Covid-19 positive, sparking public outburst.

June, 2021: A Covid-19 positive man dies from complications shortly after being denied medical care and sent home. Ambulance and other health and medical services are unavailable to many

June 22, 2021: Minister of Health announced that the country is in deficit of health infrastructure and human resources, especially specialists in intensive and emergency care. Volunteers are called for in addition to mobilizing resident doctors and final year medical students. (Source: https://ikon.mn/n/299g)

July 6, 2021: Health workers protest outside the government building demanding additional wages amidst combatting the increasing Covid-19 cases

Covid-19 death toll and case severity could be higher in countries with high levels of air pollution. (https://www.hsph.harvard.edu/c-change/subtopics/coronavirus-and-pollution/)

Note

There are numerous anecdotal stories of Mongolians unable to access the health and medical services needed. The above examples are reported cases to demonstrate the variety and mechanism of inability to access services.

C2M2 ULAANBAATAR PROJECT ASSESSMENT

The C2M2 Ulaanbaatar project had outlined the following objectives with the goal of facilitating access to health services during the COVID-19 pandemic to mitigate the secondary health impacts:

- Create a comprehensive, up-to-date database of available health services in Ulaanbaatar
- Develop vulnerability assessment to assess health and essential service access in Ulaanbaatar
- Improve data availability and quality for Ulaanbaatar on OpenStreetMap

The three objectives were identified to support the goal of the project via the use of open, geospatial data. In terms of overall assessment of the project, the objectives have been achieved. The project has also achieved additional technical results and has been establishing foundation for stakeholder and public engagement and awareness. This table outlines the project results in quantifiable and qualifiable indicators.

Comprehensive, up-to-date health service information database for Ulaanbaatar

Activities

1.Initial survey 2. Data collection 3. Data processing 4. Data entry 5. Development of web-based portal 6. Development of mobile application 7. Pilot testing and feedback

Outputs

1. 15 informal interviews on current health service information access behaviour
2. Web portal and Mobile application
3. Compiled feedback from 20 users representing the general public, health, and IT professionals

Activities

1. Collect, compile and clean data for analysis
2. Consultation with global team
3. Geospatial analysis of vulnerability measured by access to health and essential services.

Outputs

Identification of areas/communities in Ulaanbaatar city with highest level of vulnerability due to limited access to health and essential services

Vulnerability assessment of Ulaanbaatar settlements

Improved OpenStreetMap data in Ulaanbaatar

Activities

1. Prepare training materials and video tutorials
2. Recruit and engage volunteer mappers
3. Organize and provide training to volunteer mappers
4. Organize mapathon events
5. Give presentations and lectures

Outcomes

1. Crowd-sourced mapping on OpenStreetMap
2. Improved local capacity on OSM
3. Awareness raising about open data and OSM
4. Creating and strengthening of local volunteer mappers community in Mongolia

International collaboration and guidance

Activities

1. Bi-weekly regional project meetings
2. Meetings and consultations with global project team and principal investigator
3. Feedback and input from regional and global partners
4. Project events and presentation activities

Outcomes

1. Local NGO capacity building in Mongolia
2. Project implementation and strategy support
3. International collaboration experience
4. Knowledge-sharing opportunities
5. Awareness of regional/global impact of COVID-19
6. Networking opportunities

Additional objectives achieved

Activities

1. Data collection of health services in 21 provinces, 330 sub-provinces
2. Mapping of essential services nation-wide, outside Ulaanbaatar
3. Research on health service access related information and resources
4. Stakeholder support provided to the Ministry of Health of Mongolia via provision of geo-data of existing health services

C2M2 ULAANBAATAR PROJECT RESULTS

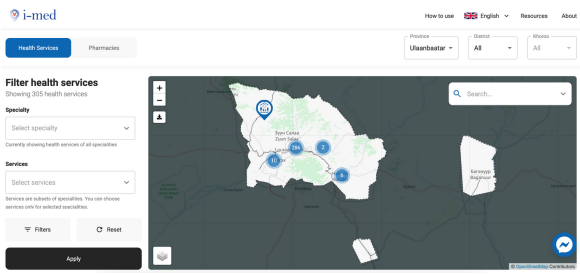
Health service information portal

1. Web-map-based database
2. Mobile application of database

Key characteristics:

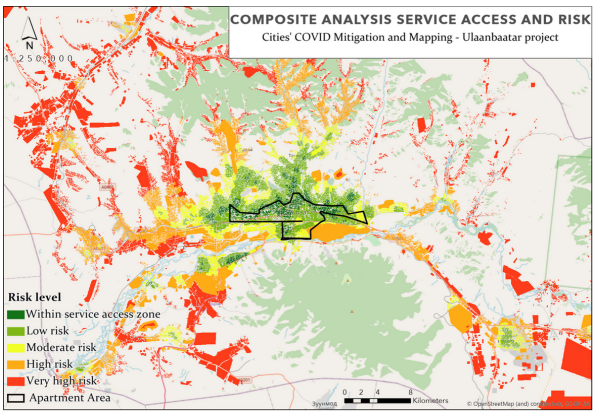
- Multi-functional
- Open-data based
- User-friendly
- Dual-language
- Comprehensive
- Up-to-date
- Nation-wide

i-med



Maps/Vulnerability analysis

- Health service access
- Transportation service access
- WASH service access
- Food access
- Education access
- Composite vulnerability map
- Crowd-sourced locations of pharmacies selling hand-sanitizers



Health Service Data

Ulaanbaatar

- 1004 pharmacies
- 121 public hospitals
- 763 private hospitals

21 province, 330 sub-province

- 859 hospitals
- 792 pharmacies
- other essential services
  - financial services
  - WASH services
  - food services
  - fuel services etc.,

OpenStreetMap contribution

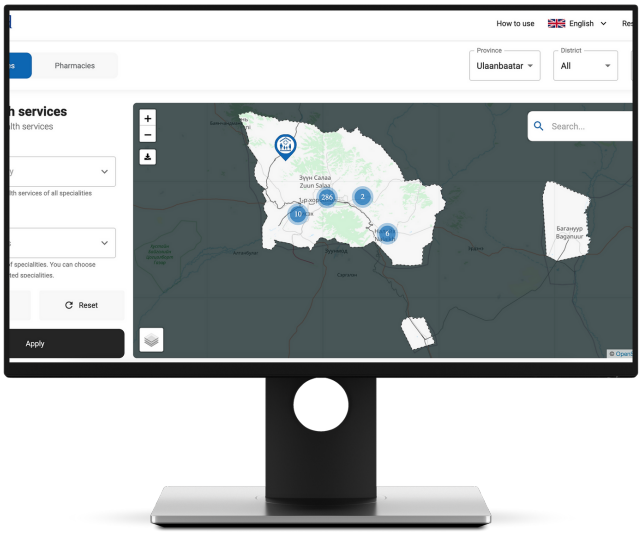
- 200,000 buildings
- 7,600km of road
- 3.5million total edits
- 250+ volunteer mappers trained
- 30+ mapathon events organized

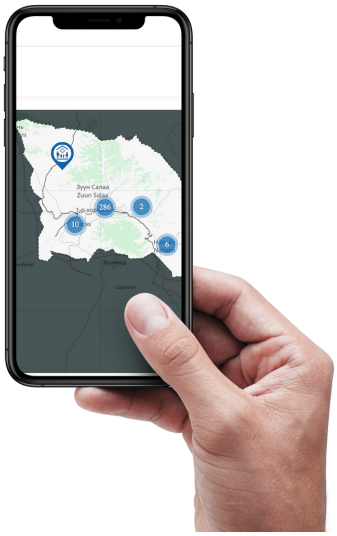
Awareness and stakeholder engagement

- Monthly meeting with relevant health sector stakeholders
- Collaboration workshops
- Stakeholder awareness and call for collaboration event
- Social media campaign
- Short-video series

DESCRIPTION OF THE HEALTH SERVICE INFORMATION PORTAL

The health service information portal has the following key functions and intended use of each function. The table below describes only the key functions to provide overview of the web and mobile portal capacity.





The health service information can be access via

WWW.I-MED.MN

or

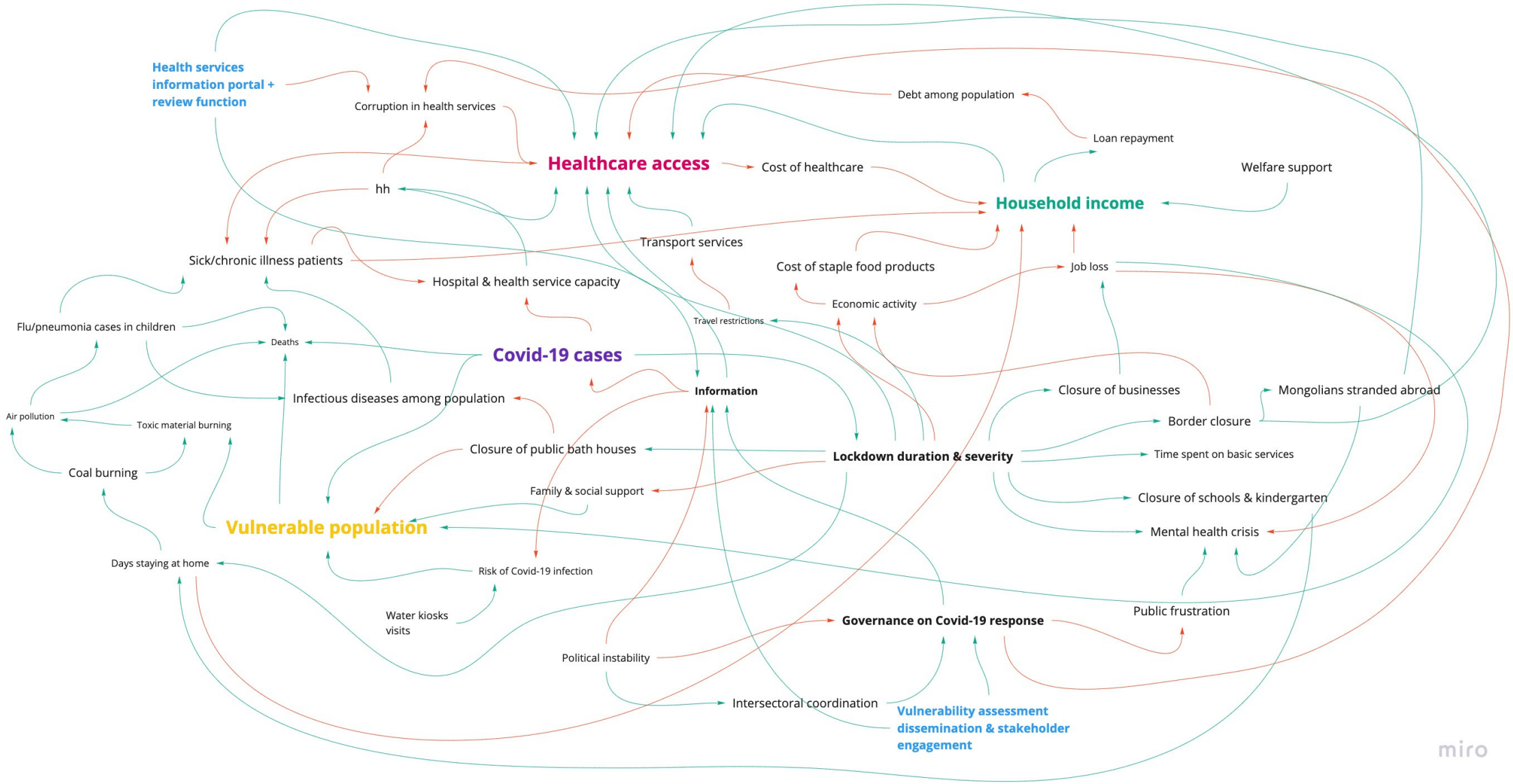
by downloading from PlayStore on Android phone by searching

IMED MONGOLIA

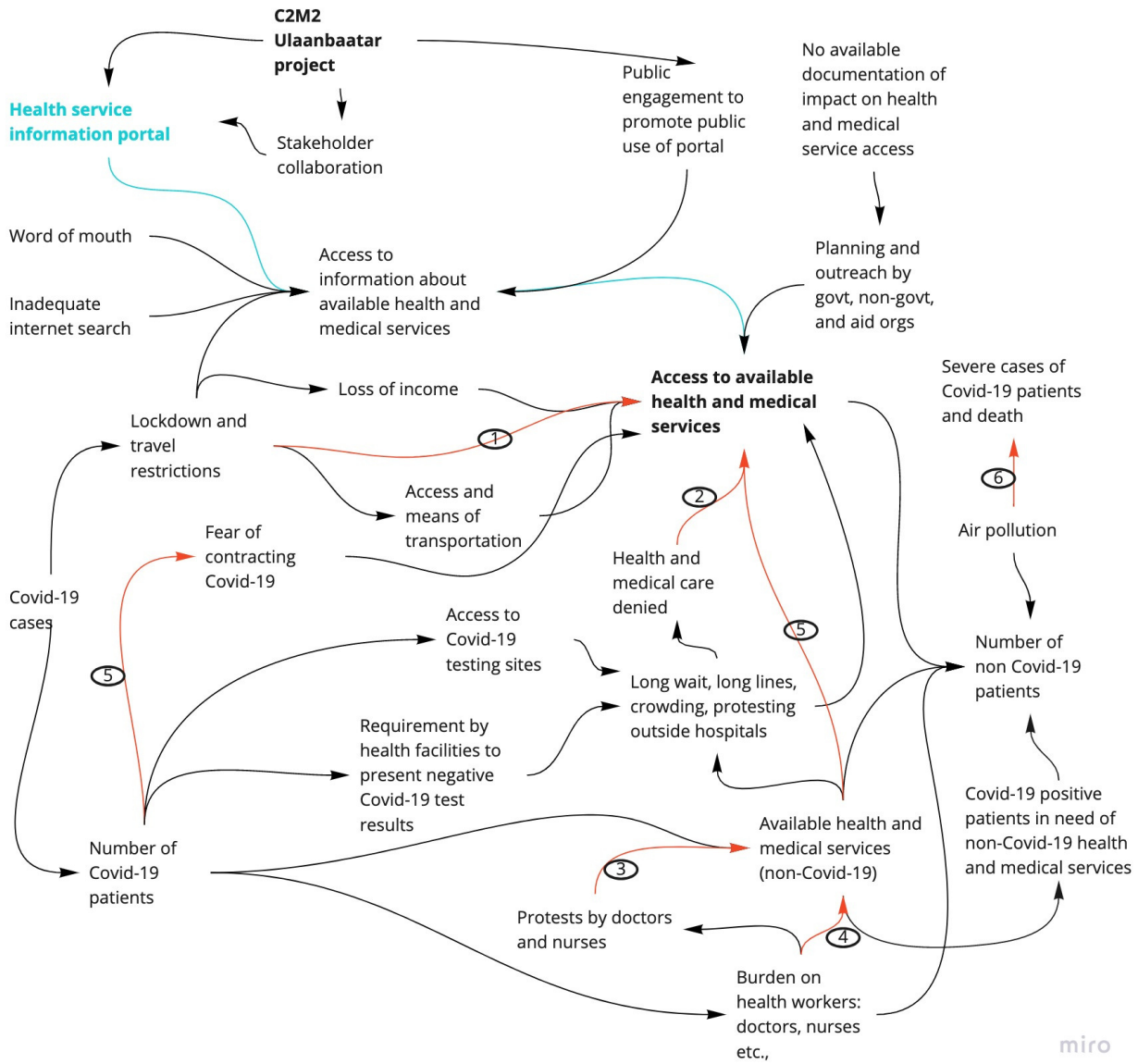
KEY FUNCTIONS OF THE HEALTH SERVICE INFORMATION PORTAL

No.	Key functions	Intended use	Web	Mobile
1	How-to-use tutorial	Easy to understand, step-by-step tutorial on how to use the portal	Y	Y
2	Search hospitals and pharmacies separately	Easy bulk categorization of available health services	Y	Y
3	Search by geographic location/administrative boundary	Facilitate search by city, district, province, sub province levels	Y	Y
3	Search hospital category health services by specialization	Facilitate search process by narrowing down by specialty type	Y	Y
4	Search hospital category health services by specific service within the specialization	Facilitate search process by narrowing down by specific service needed	Y	Y
5	Review service and leave comment	Promote usership and transparency	Y	Y
6	Provide edit to data on any available or new health service	Ensure data relevance, update OSM or google form to accommodate anyone with suggested edits	Y	Y
7	Messenger chat support	Provide real-time support to users	Y	Y
8	Navigation to selected health service	Facilitate commute planning	N	Y
9	Resources page	Provide useful, practical information on health service access and policies	Y	Y

ULAANBAATAR PROJECT CAUSAL LOOP DIAGRAM



HEALTH SERVICE ACCESS CAUSAL LOOP DIAGRAM



Reported cases of observed impact on access to health and medical services correlate to the numbered red arrows

1. **December 8, 2020:** A woman from Arkhangai province dies at the Ulaanbaatar city's border due to travel restrictions and being unable to access emergency medical care. (Source: http://time.mn/piD.html)
2. **June, 2021:** A Covid-19 positive man dies from complications shortly after being denied medical care and sent home.
3. Ambulance and other health and medical services are unavailable to many
4. **July 6, 2021:** Health workers protest outside the government building demanding additional wages amidst combatting the increasing Covid-19 cases
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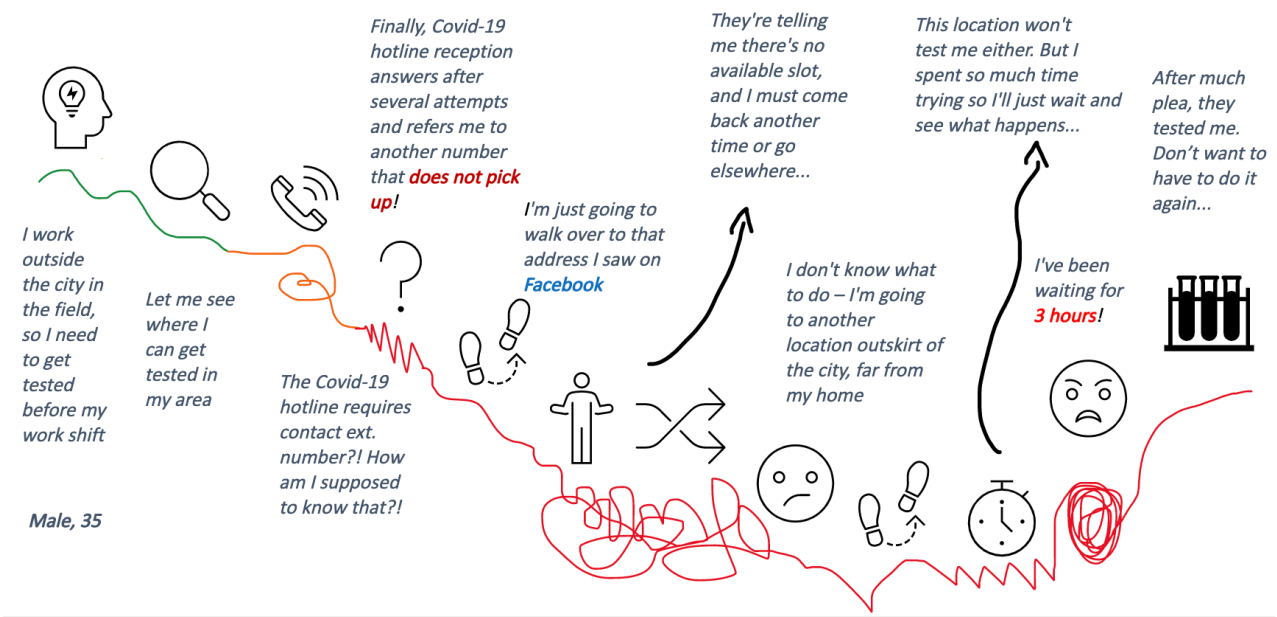
7. Covid-19 death toll and case severity could be higher in countries with high levels of air pollution. (https://www.hsph.harvard.edu/c-change/subtopics/coronavirus-and-pollution/)

LESSONS LEARNT AND OBSERVATIONS

At the conception of the project, we were aware of the lack of comprehensive health service information portal, and that getting information on available services is a significant barrier for the public in accessing health and medical services on time. Our assumption was that this existing challenge in health service access will be exacerbated by the burden of the COVID-19 pandemic in the country.

In the first component of the project, following the development of the baseline assessment, we conducted a series of informal interview with sample population to better understand how Mongolians in Ulaanbaatar city get information about available health services. We made few observations from the interviews. We found that the interviewees fell into the following information access behaviors: word-of-mouth inquiry, in-person inquiry, and online inquiry.

We confirmed through the interviews with a sample of interviewees that the process of obtaining the information about health and medical services is a time-consuming, cumbersome process that delay the access to the necessary health and medical services. All the interviewees expressed the need for a comprehensive information portal to help facilitate not only getting information about available services, but as a tool to be able to compare available service providers by location, customer reviews and services offered etc.,

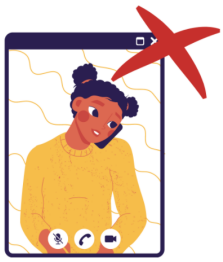


HOW DO MONGOLIANS FIND INFORMATION ABOUT AVAILABLE HEALTH AND MEDICAL SERVICES?

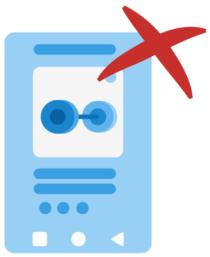
Word-of-mouth inquiry was the most common among interviewees from outskirts or rural areas or those with less online search experience or skills. We infer from this that many of the rural population, elderly, and those from low-income or low-education households would rely most on this method of obtaining information about health services. The word-of-mouth inquiry is often used when a person knows someone in the health sector, especially doctors in their social circle. Therefore, not everyone can also take advantage of the word-of-mouth way of getting information about health and medical services.

In-person inquiry refers to the behavior where a person would visit the health service site personally by commuting to get the information and possibly the service itself. We observed that people who travelled into the city from rural areas for health or medical services or those who recently moved to the city and still unfamiliar tend to resort to this method of inquiry. This method of inquiry is very time and energy intensive as one must commute, search for the location and wait in line in order to get the information on site. We infer that many of the recent migrants in the capital city, living in the fringes of ger area will rely on this inquiry method.

Online inquiry includes phone calls, social media, and search engines. Most interviewees expressed that they prefer to talk to someone rather than search for information on websites or social media pages for reasons such as lack of online research experience and uncertainty about whether the information found is reliable. However, the way to get the phone number for health services is to call an information call center to get the number for the service provider or search online. The call centers may not always have the detailed, or up-to-date contact information that are smaller private health or medical service providers. Social media pages are common however, the amount and reliability of the information is an issue. Search engine results are also sporadic, uncomprehensive and can be out of date.



Word-of-mouth only information



Unreliable, hard-to-trust information

District ambulance won't come - too busy

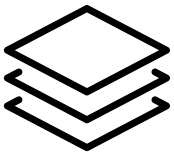
DATA ON AVAILABLE HEALTH SERVICES

The information on available health services was not only inaccessible, but also to a certain extent unavailable. There was no comprehensive, up-to-date database of available health service providers. While we found sets of data on health services in various formats, there was no up-to-date, comprehensive dataset to rely on completely.

We worked with the multiple sets of available data to triangulate and develop a final list of health services. However, we found that the information on the health service providers were not accurate, especially regarding location. This prompted the unforeseen need to carry out an extensive level of field work.

Our interaction with some key stakeholders in the health sector revealed this data gap to be the case. A recently established government agency responsible for registration and licensing for health service providers, Medicine and Medical Equipment Registration Agency sought our support in presenting the locations of available health services to the Ministry of Health of Mongolia.

Similarly, the National Emergency Management Agency benefitted from the health service database and the improved OpenStreetMap data develop by the project in COVID-19 response. NEMA uses OSM as one of its main geospatial tools. This was especially relevant when we trained local volunteer mappers in 21 provinces to map health and other essential services in 21 provinces outside Ulaanbaatar.



Multiple sources, but not integrated

Outdated, multiple sources from different years

Unreliable, course, accuracy questionable

Lacking geolocation or wrong addresses

Multiple formats e.g., pdf, web, excel etc.,

Required extensive field work

Time-consuming, labour-intensive

Required detailed verification

Health and safety concerns during fieldwork and project duration

C2M2 ULAANBAATAR PROJECT REVIEWED DATA LIST

Product	Data topic		Format	Collection
Health service platform/app	-Hospitals/ Clinics/ Laboratories/ Pharmacies etc., *(15 categories of health services from primary to specialized)*		GIS + attribute	Survey123
Vulnerability analysis	Basic urban services (By distance)	-Schools & kindergarten -Health services -Bus stops & route -Water kiosks -Public bath houses	GIS GIS GIS GIS GIS	Existing data
	Essential services (By distance)	-Grocery stores -Kiosks (food, phone & bus credit) -Markets -Coal sales points	GIS GIS GIS GIS	
	Socio-economic (By khoroo)	-Density of low-income households -Density of people with disabilities -Density of single mothers	Statistical	
	Environmental hazard (locations)	-Air pollution -Distribution of pit latrines -Flood risk areas	GIS GIS GIS	

Thematic maps & analysis	Required data lists	Status
Education	School; Kindergarten	Usable
Health	Clinics; hospital; Pharmacy	Usable
Public Transportation	Bus stop; bus route	Usable
Water sanitation and hygiene	Water kiosk, Public Bath	Usable
Essential services: Food	Grocery store-6;8; Tuts, Market;	Usable
Essential services: Energy	Heating type; Improved Fuel Points,	Usable
Air, soil pollution, flood risk	Environmental pollution/hazard	Unusable
Single mothers	Socioeconomic data	Usable data unavailable
Disability	Socioeconomic data	Usable data unavailable
Low income	Socioeconomic data	Usable data unavailable

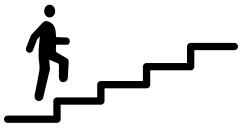
DESCRIPTION OF THE OPENSTREETMAP DATA AND CAPACITY

The OpenStreetMap community is new and local capacity is beginner level in Mongolia. During the project, we worked on not only improving the OSM data for Ulaanbaatar and Mongolia, but also to improve local technical capacity to work on OSM. The efforts made on OSM during the project was aligned with our organizational long-term goal of promoting and developing a strong, cohesive OSM community in Mongolia.

The awareness on OSM is increasing in Mongolia, although a lot of work remains to be done. OSM is increasingly the default base map for various map-based applications and websites, although not mainstream. For example, a popular travel app among Mongolians maps.me uses OSM as its base map. Therefore, improving the data on OSM in Mongolia would benefit the public even if the usership is not directly linked to OSM platform.

We created but also translated training materials and other resources on working with OSM and provide technical training to any willing volunteer mappers. We organize mapathon events as the main channel of engagement. We found that truly crowdsourcing data on OSM with anyone interested can be detrimental since the local baseline capacity is low, and results in inadequate data quality. Therefore, we preferred to work with closed groups of people whom we interact more closely and provide more in-depth training and guidance.

In Mongolia, we need more OSM data validators and continue to improve technical capacity and number of volunteer mappers. Beyond these goals, learning and transferring capacity on field work data collection and other tools will be most needed to continue to promote open-data and use and creation of open data among government, civil and private stakeholders.



The OSM community in Mongolia is largely beginners and needs more capacity building

Lack of awareness and understanding of OSM creates lack of incentive to participate and volunteer

Crowd-sourced data tended to have a lot of errors and needed detailed review and corrections

New volunteer mappers needed repeated training, guidance, and review of their work

Creating local, small groups of volunteer mappers promoted sense of community quality of work

CHALLENGES WITH OPEN-DATA CULTURE AND GIS CAPACITY AT GOVERNMENT ENTITIES

The culture of open data is a huge barrier for Mongolia's development. Inaccessibility and unavailability of more detailed and granular public data presents a challenge for all sectors in making informed decisions. For example, we were unable to obtain a consistent, complete, up-to-date, and granular set of socio-economic status data. Each dataset we were able to obtain were only for certain districts or settlements of the city of Ulaanbaatar, from different years, and at district or large-scale level. Khoroo, or the smallest administrative unit-based data was lacking consistently. These challenges limited our ability to further our vulnerability assessment.

Moreover, use and availability of geospatial data remains limited with key challenges in terms of recency, completeness, and reliability. The overall limited technical capacity at all levels of government entities results in poor or nonexistent geospatial data. More importantly, the lack of technical GIS capacity at lowest level of public administration is they key barrier because all the data is collected through the primary level of administration where key surveyors are not trained or equipped with tools and knowledge necessary.

Higher level of government entities with a few exceptions, largely continue to use paid geospatial services such as Mapbox, Google maps or ArcGIS. Our meetings with government stakeholders illustrate the lack of understanding, awareness, and technical capacity on OpenStreetMap or open-source geospatial tools. While geodata is becoming more popular, and there are a few efforts to develop public GIS database, the efforts are uncoordinated, uncollaborative and lack sustainability plan. For example, two different ministries may commission nearly identical GIS project to private service provider without ensuring technical capacity within the government agencies. Such project soon run out of resources to hire private service providers and maintenance, troubleshooting and future developments are halted, resulting in outdated, failed platforms.

CHALLENGES WITH KEY HEALTH STAKEHOLDER ENGAGEMENT

The project was designed to function without compulsory government stakeholder engagement or partnership to ensure success in implementation of project activities on time. It does not exclude stakeholder engagement from the project and key stakeholder collaboration remains an important component of the project's long-term outcome and future development.

During the COVID-19 pandemic, we faced significant challenges to fully engage key health government stakeholders due to the COVID-19 response in the country taking up all available resources and time at these key stakeholder agencies. Finding available time to meet and follow-up on previous meetings were quite challenging as these key agencies worked at full capacity in response to the pandemic.

In addition, instability in politics and COVID-19 governance has significantly impacted the project's ability to meaningfully engage and collaborate on tangible outputs. The resignation of Prime Minister and his entire cabinet, Head of Special Committee for COVID-19, and other key roles in the main health sector agencies resulted in uncertainty and limitations on potential contact points. The high-level COVID-19 and health sector governance made it very difficult for both any available health sector stakeholder point of contacts and the project team to agree on potential collaboration.

The high turn-over rate of government employees and political seats have always been a significant barrier to sustainability of coordination and collaboration of initiatives. During the COVID-19 pandemic, new working groups and new agencies have been established without solid certainty of their continued existence or clarity of their scope of work.

We observed that poor governance during the pandemic also provided opportunities for corruption or pursuit of personal agenda. Due to these limitations, establishing partnerships with nay key government stakeholder remained a challenge. However, the project continues to explore potential, meaningful areas of collaboration and coordination where possible. We will continue, beyond the project period to seek stakeholder engagement in the form of awareness raising and capacity building activities.

DESCRIPTION OF THE VULNERABILITY ANALYSIS

The goal of the vulnerability analysis of Ulaanbaatar settlement is in two-folds. First, it is to identify communities in Ulaanbaatar facing the most vulnerability factors created by the level of access to public and urban services during the COVID-19 pandemic. Second, the methodology for the vulnerability assessment developed within the C2M2 project will be utilized to continue creating an annual vulnerability analysis to identify, monitor and track Ulaanbaatar's ger area communities' vulnerability levels in terms of level of access to public and urban services to inform relevant stakeholders.

The vulnerability assessment is intended to inform the stakeholders about areas in Ulaanbaatar that need more outreach and support during the COVID-19 pandemic. The vulnerability assessment identifies settlement areas that potentially face the highest levels of vulnerability factors due to the geographic, physical, financial, and social access to health and essential services. We identify settlements with high risk for each service. However, access to each service impacts access to other services and the impact may accumulate as composite impact. Therefore, we also illustrate the composite level of vulnerability factors considering the access to all the service types included in the assessment.

The vulnerability analysis is developed based on government data on different public services, as seen in this table. We choose to work with government data, that are likely to be updated annually. This would enable us to develop the vulnerability analysis an annual document to monitor progress of neighborhoods, and inform key stakeholders in government and civil society on where are settlement areas with most vulnerability factor, where are the gaps in essential public services, and where are the points where new points of essential services could be extended to such as new water kiosk point, or bus stop.

The vulnerability analysis is developed based on government data on different public services, as seen in this table. We choose to work with government data, that are likely to be updated annually.

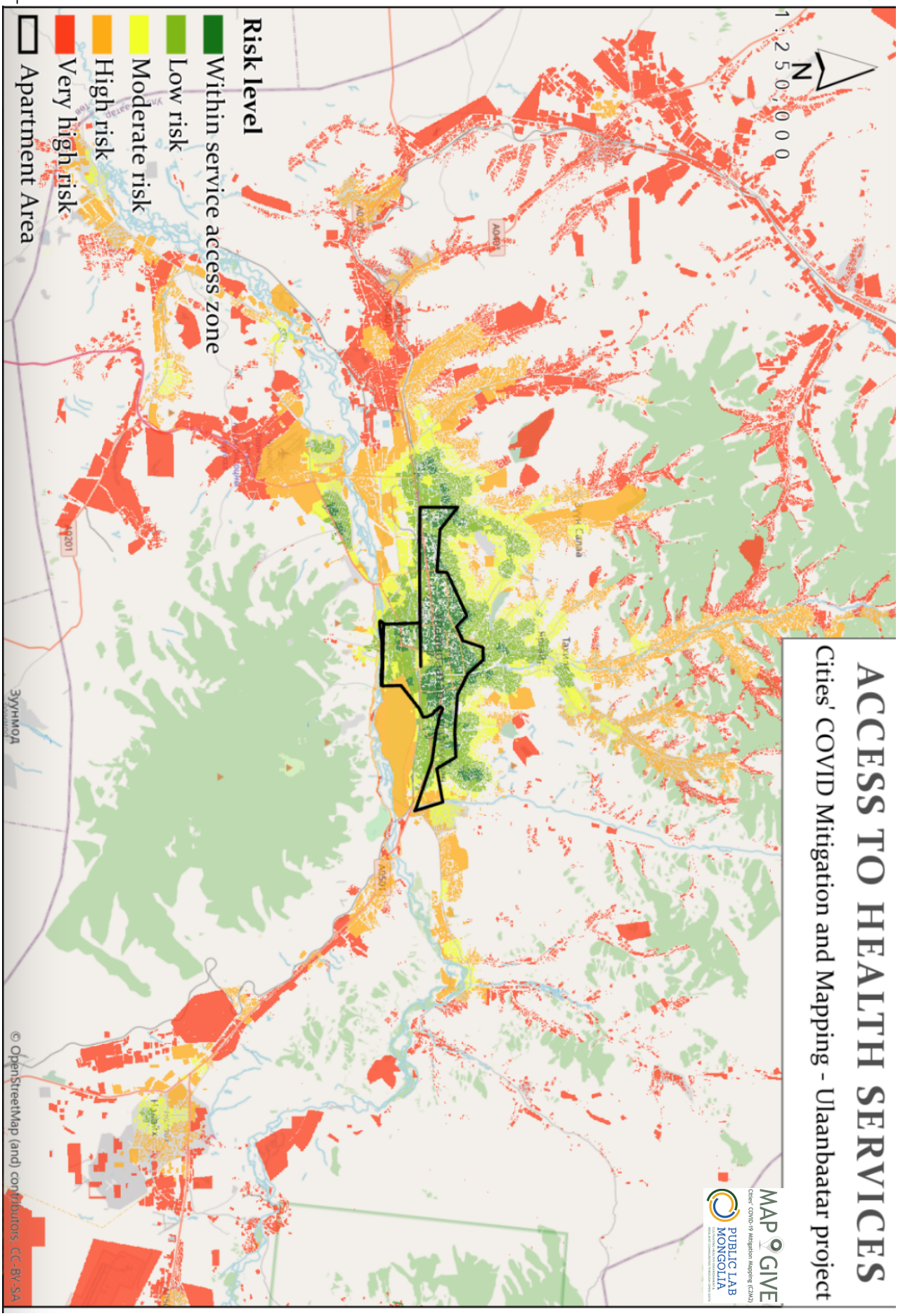
The method we used to develop the vulnerability analysis is level of service access for residents across the city. We have developed 5 levels of service access. First level is based on service access standard set by the government, Article 5.4 of Urban Planning and Construction Regulation Norm. This is usually 300-500 meters. The subsequent four levels double, triple, quadruple, and quentable the standard service access radius.

Within service zone
Low risk
Moderate risk
High risk
Very high risk

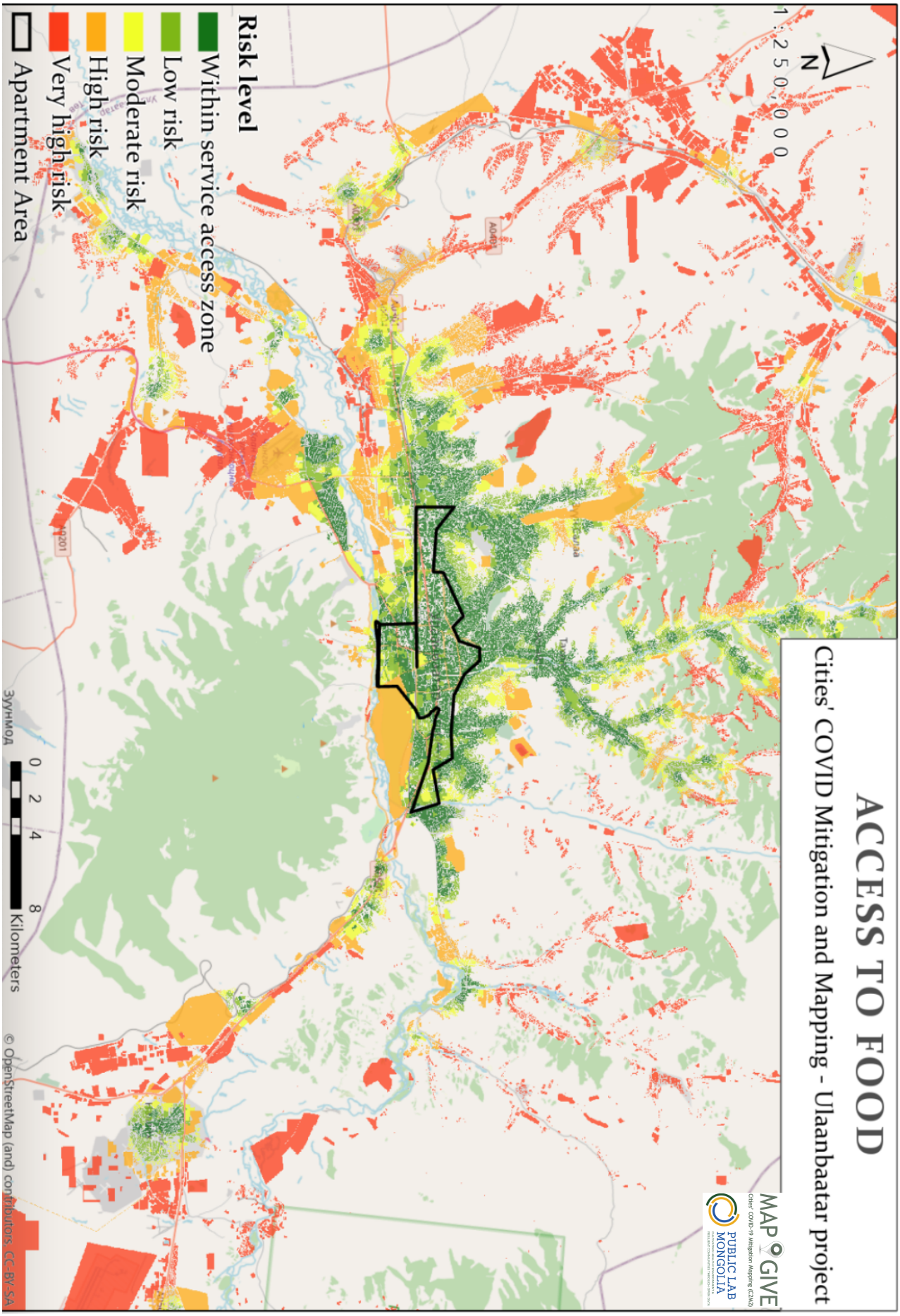
The resulting maps for each thematic area (in the table below) illustrate, therefore, where in the settlement areas have what level of service access for the various public services (single criteria analysis). Single-criteria analysis identify settlement areas with inadequate access to one given service. We assumed that settlement areas that have the least points, meaning farthest from essential services face the greatest number of vulnerability factors.

	Available data	Description	Thematic maps	Year	Source
1 2	Schools Kindergartens	Locations of public sc hools and kindergarte ns	Access to educational services	2019	Department of Education
3 4 5 6 7	Clinics Hospitals Laboratories Other services Pharmacies	Locations of health an d health related servic es	Access to health services	2020	Field collecti on by PLM; Ulaanbaatar Mayor's office
8 9	Bus stops Bus routes	Locations of bus stops and information on bus routes	Transportation and Mobility	2019	Ulaanbaatar Mayor's office
10 11	Water kiosks Public bath houses		Water sanitation, hygiene	2019	Ulaanbaatar Mayor's office
12 13 14	Grocery stores Markets Kiosks	Locations of stores, large markets and small kiosks	Access to essential food services	2019	Ulaanbaatar Mayor's office
15	Socioeconomic data	By khoroo boundary administrative unit	Community socioeconomic status	N/A	Usable data unavailable
16 17	Environmental pollution Flood-risk areas Elevation	Locations of pit latrines Polygon locations of flood-risk areas	Community environmental risks	2019	Usable data unavailable
18 19	Base map data Settlement areas Roads	Plots indicating settlements Linear data of road infrastructure	Access to health and essential services	2019	Ulaanbaatar Mayor's office DSM

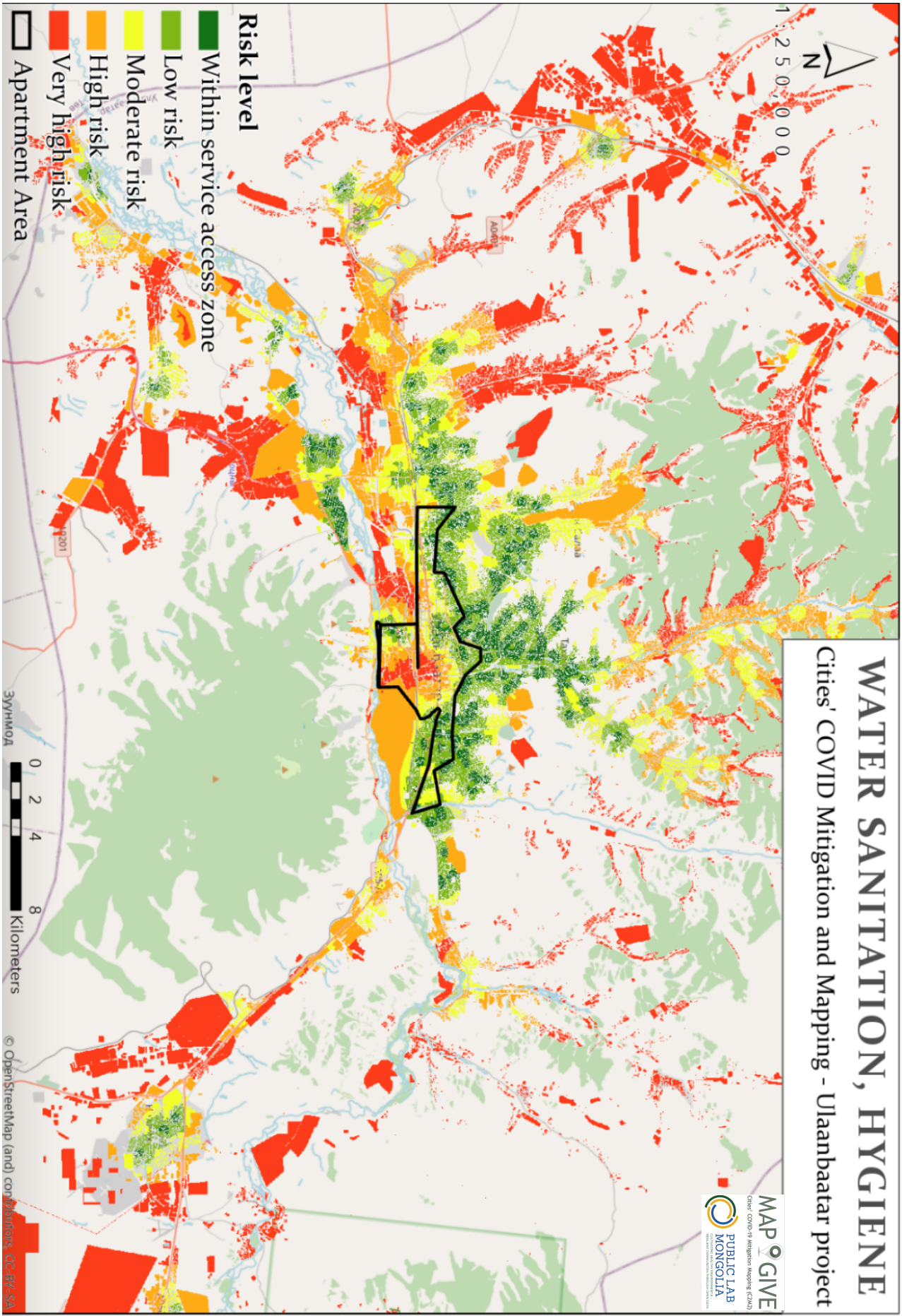
First, access to health services. You can see the access levels differentiated in colors from dark green being within standard service access to red being 5 times further than the service standard access. As you can see, the green zones are mostly within the apartment areas which is market with black outline.



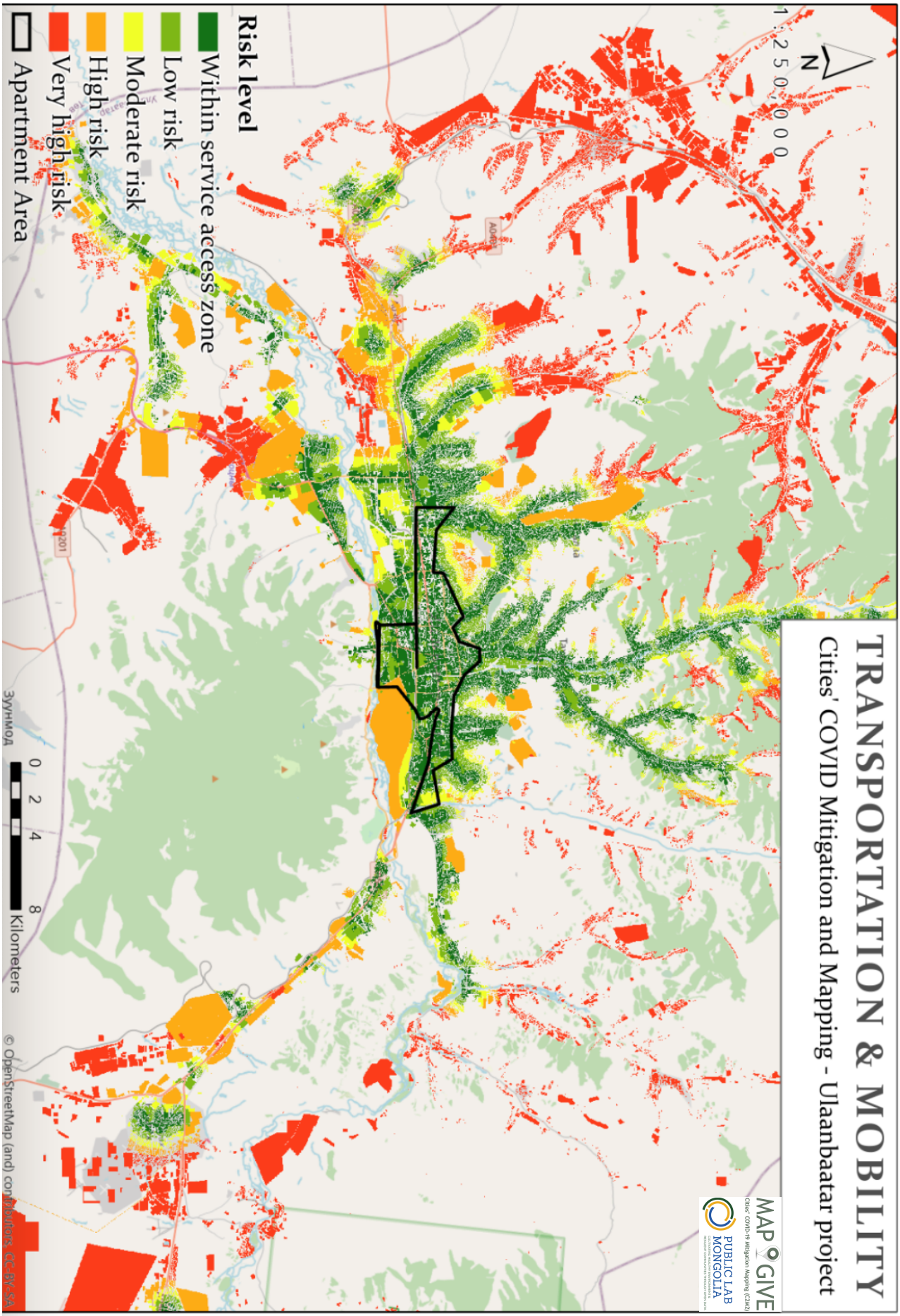
Next is access to food sources including grocery stores and markets, you can see that the green areas become much bigger than health services. This means there is wider distribution of grocery stores and markets than health services However, the fringe areas still remain large orange or red.



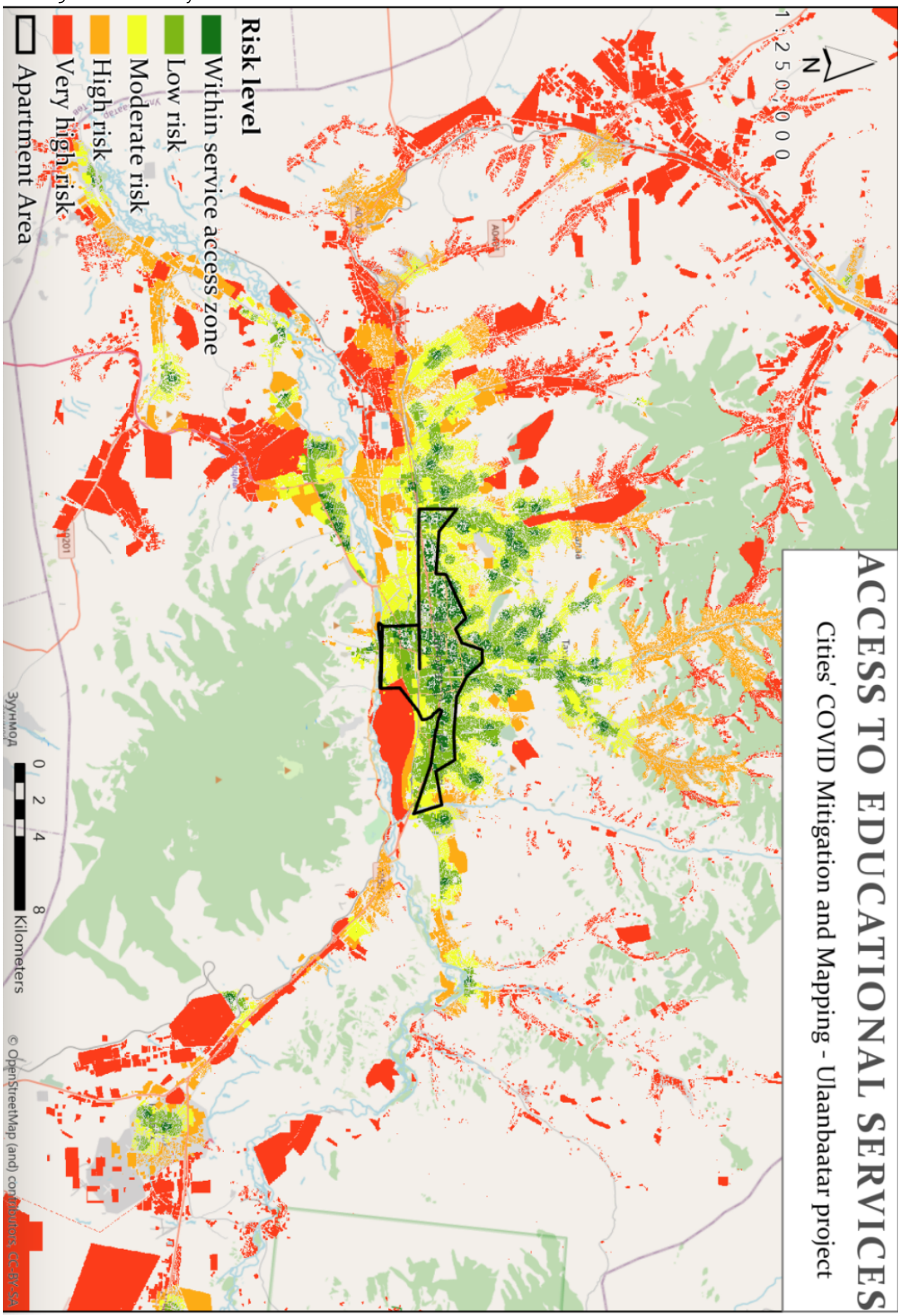
Then we look at WASH services which include water kiosks and public bathhouses. You may notice there is a lot of red in the apartment areas. This is because there is no water kiosks and public bathhouses where there are apartments with modern commodities. You see that central and mid ger areas have green and yellow level access while fringe areas again show up as orange and red. A lot of the fringe ger areas are located on hillsides and harder to access geographic locations, where water kiosks are not built due to being far from central water pipes, or too deep to drill.



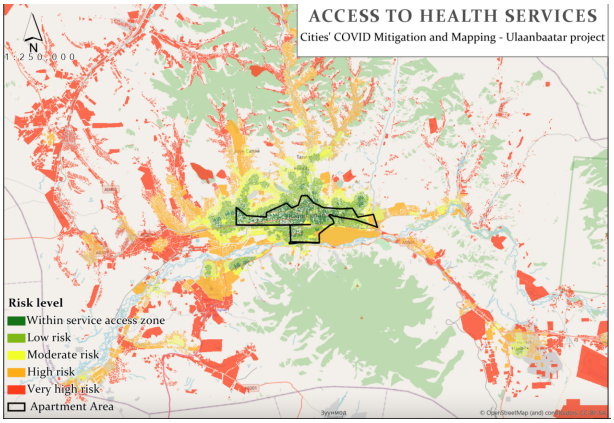
Next we look at transportation and mobility thematic map. As you might notice, the green level service access is much bigger than the previous three thematic maps. This is good, so that people can access public transportation more easily in the ger areas, but we still see the some of the fringe areas in red where access is very limited. The mobility and means of available transportation is an important indicator in that adequate access to transportation facilitates access to other essential services.

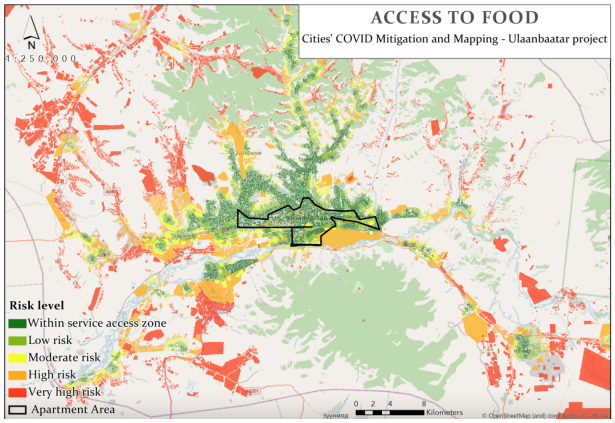


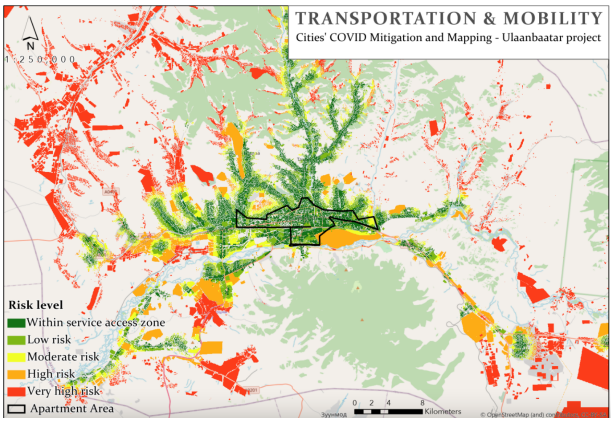
Finally we look at thematic map analysis for educational services. These include public schools and kindergartens. Again a similar trend of dark green in apartment areas with good access, and central ger area in yellow, while mid and fringe ger areas are in orange and mostly red.

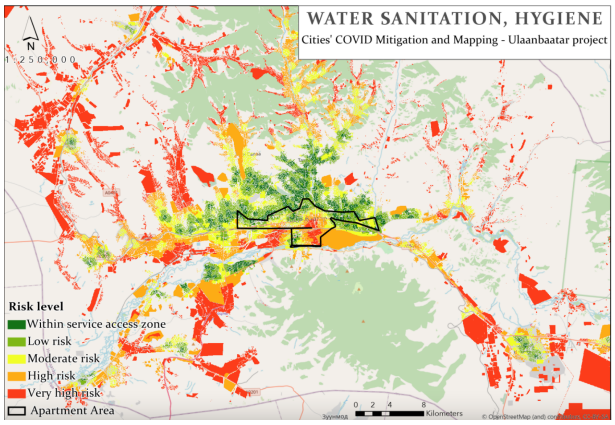


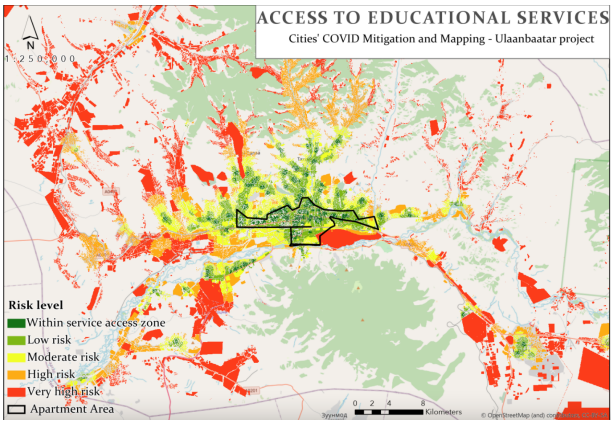
The ger areas that appear mostly orange and red in most of the thematic maps are fringe ger areas. As the city lays in a valley surrounded by mountains, it can mostly expand to west and east, where many of the new urban migrants come to settle down. It is important to understand that new urban migrants may also face challenges other than just geographic service accessibility, but social, financial and informational access as well. When compared side by side, just by general impression, the health service has much more visibly limited access for ger area residents, where almost only apartment areas and some of central ger areas are shown in green. This in a way illustrates the need for mitigating the impact on health service access, especially during the pandemic.





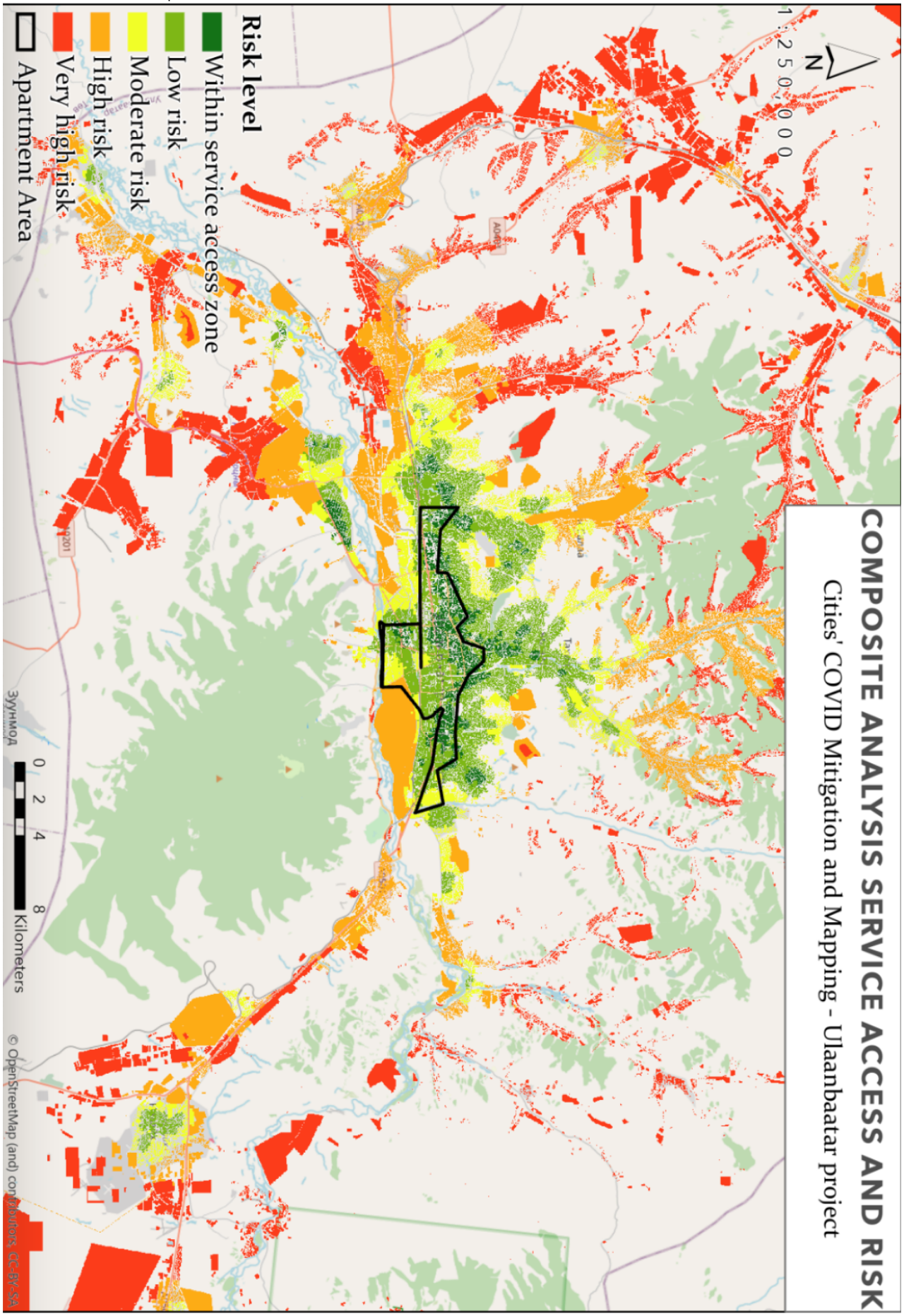






The centralization of health and medical services not only pose physical limitations to access to health services but also present additional limitations and challenges related to mobility, financial, informational, and time-spent compared to those living centrally in the city.

The vulnerability analysis is especially important in the times of the Covid-19 pandemic and future public health or other crisis to inform key stakeholders and effectively minimize the impact on the most vulnerable communities.



RECOMMENDATIONS

The C2M2 project team proposes the following recommendations for improving access to information about available health and medical services:

1. Inter-sectoral stakeholder collaboration is recommended to ensure up-to-date, comprehensive, geo-location data of available health and medical services in the country.
2. Build local, technical capacity in GIS and geo-data management for government stakeholders that are responsible for maintaining health and medical service database
3. Put in place a policy to update new and available health and medical services database.
4. Link the above-mentioned comprehensive database to a public-facing information portal such as www.i-med.mn.
5. Conduct capacity-building training and workshops for health and medical service provider administrative stakeholders to ensure sufficient capacity to update service information in www.i-med.mn
6. Provide timely, useful, easy-to-understand information and resources related to accessing health and medical services on the public-facing information portal where detailed information about available services are accessible.
7. Conduct large-scale awareness and engagement activities for the general public, especially those located in areas with higher vulnerability factors.
8. Capacity building, community building and expanding, local representative training workshops, outreach, and engagement activities are recommended to improve strengthen the existing OpenStreetMap community in Mongolia, but also to promote the culture of open-date in the country.
9. Improve OpenStreetMap data on basic infrastructures and settlement zones to improve navigation functions on www.i-med.mn mobile app and other commonly used apps in Mongolia
    a. update data and map new settlements in Ulaanbaatar
    b. map settlements outside Ulaanbaatar that are largely unmapped
10. Collect data on customer review and rating on health and medical services to compile and conduct a customer satisfaction survey/study using the www.i-med.mn
    a. further develop customer review and rating functions to improve service quality
    b. link customer rating with health insurance or use as a tool to advocate for improving health and medical service quality
11. Second-phase of the project is highly recommended to achieve intended impact of the project and ensure sustainability of the project results.

LIMITATIONS

The project had three main limitations include areas concerning data, awareness, and engagement. These limitations were observed and experienced by the project team and are described in terms of reasons for these limitations and potential results and outcomes if these limitations were resolved.

Data limitations

Data limitations concern detailed socio-economic status data for more in-depth assessment of vulnerability factors across the Ulaanbaatar settlement areas. The socio-economic status data would afford further analysis to identify communities with higher vulnerability factors in more granular level. More specific identification of such communities would better inform government and civil society organizations to plan and target initiatives directed to alleviate and mitigate the impacts of COVID-19 pandemic. Within the context of our project, detailed analysis of community level vulnerability assessment would provide us with information to prioritize community outreach and awareness activities. For example, in-person workshops and awareness activities on the health service information portal can be organized to better reach those in high-risk communities and neighborhoods.

Second data limitation is the data on impact of health service access during the COVID-19 pandemic. The project was not able to capture the extent of the impact of the pandemic on health and medical service access. Comprehensive data that capture and illustrate the extent of the impact on the ability to access health and medical services would provide a deeper understanding of more specifically what kind of health and medical services became most inaccessible, reasons for inability to access these services and finally insight on health and death burden due to limited or lack of access to health and medical services. Quantitative as well as qualitative data on the challenges with health and medical service access during the pandemic would inform not only the project but also key stakeholders on better planning to improve access to these services. However, only very limited data is available on the health and medical service access situation.

Awareness and engagement limitations

The government policies in response to COVID-19 pandemic set limitations to in-person activities for the most part of the project duration. Measures including strict lockdowns, travel restrictions and prohibition of in-person gathering made project implementation challenging and some activities impossible. Engagement with key health stakeholders became a challenge as the pandemic went into full swing in the country, requiring full capacity of the potential stakeholders.

Furthermore, personal safety became a significant concern during the pandemic both before and after vaccination. Mongolia continues to see high rates of COVID-19 infection despite the high vaccination rate. All project team members and collaborating stakeholders have been affected directly via personal contraction of the virus or that of immediate family members requiring hospitalization and extended care.

While the project team took opportunities for online and in-person meetings and awareness activities wherever possible, the full potential of awareness, engagement and training opportunities have been significantly reduced.

Additional considerations for project limitations

The COVID-19 pandemic, lockdown, risk of infection and health burden from the virus on the project team or their families posed limitations.

- Field work for data collection was not as efficient as initially planned and took much longer and harder to complete due to the lockdown and health and safety concerns.
- Inability to hold in-person events and meetings also limited the project team's ability to effectively network and collaborate with stakeholders, recruit volunteers and organize data collection events, or collect full set of data on field due to restrictions and safety issues.
- The burden of COVID-19 disease within the project team and their families also impacted the flow of work and limited time spent on planned activities.

FUTURE DIRECTIONS

Despite the challenges and limitations presented by the COVID-19 pandemic, the project was able to achieve its intended objectives and beyond. The results obtained by the Ulaanbaatar project has built a strong foundation for future directions and development. The technical work of the long-term outcome of the project has been attained by the delivery of the functional health service information portal, up-to-date datasets, and vulnerability assessment materials prepared for communication and outreach.

Nation-wide expansion of information portal

The project team was able to collect and verify health and essential services data from 21 provinces outside the capital city of Ulaanbaatar. This is an important achievement which enable nation-wide expansion of the health service information portal.

The information portal developed within the project for Ulaanbaatar was intended to facilitate the access to health and medical services for residents of the city, especially those living in ger areas with limited access to essential services. However, as the health and medical services are highly centralized in Ulaanbaatar, people from outside the city travel often to access health services. Therefore, the health and medical service information portal will service the entire population of the country and not just the residents of Ulaanbaatar.

On the other hand, making information about available health and medical services in the 21 provinces also help facilitate access for those living outside the capital city, or non-locals traveling in provinces other than their own.

The health service information portal can accommodate nation-wide health service data and search functions from technical standpoint. Inputting the collected and verified data for the provinces outside the capital city would establish the portal as the first-ever national health service search tool that is available. More importantly, extending the product nationally would significantly improve usership and therefore sustainability and enable further development of the portal.

Stakeholder awareness and capacity building

Due to the limitations and challenges described in previous sections, the project outcome will be tremendously improved by continued stakeholder awareness and capacity building. Successful future direction of the Ulaanbaatar project is defined by buy-in from key stakeholders, and local technical capacity to maintain the data updated.

First, key stakeholders need to understand fully the main advantage of the portal – open-access, crowdsourcing capacity. Establishing buy-in from key stakeholders on the information portal means also getting them on board with using OpenStreetMap. The use and approval of OSM by higher level stakeholders paves an important step towards meaningfully promoting and implementing the culture of open data to improve quality of life for Mongolians via better decision-making. Raisin awareness and bringing stakeholders to the same understanding on OSM-based health service information portal is crucial to establishing collaborations attempted during the project period.

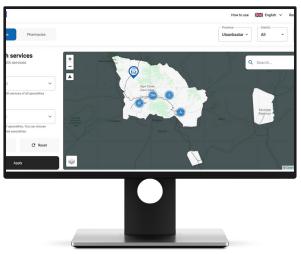
Second, building technical capacity at implementation-level and service-providing stakeholders can ensure quality, accurate update on the health service data populating the portal. Since OSM capacity is still in beginner level in the country, more capacity building need to be done, targeting specifically those directly involved with the health service data and information. These stakeholders include government agencies responsible for registration and licensing of existing and new health service providers and just as importantly, health service providers themselves – such as administrative clerks or owners for clinics, hospitals and pharmacies. The capacity building trainings for such stakeholders will need to focus on becoming adept at using the information portal and using OSM to enter and edit new and existing data.

Public awareness and outreach

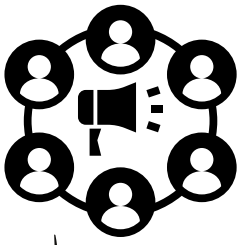
The project's main product, the health service information portal needs active usership to achieve its intended goal and remain relevant in the future. Therefore, large-scale public awareness is necessary to not only introduce the general public to the information portal but more importantly to adopt it as a new and improved way to find information on available health services. The ideal level of public awareness will result in behavior change within the public – where Mongolians are aware of the portal's existence, know how to use it, and uses it as a tool regularly in their daily lives.

An important part of the public awareness is targeted outreach in high vulnerability settlement areas such as fringe ger area communities. The resources and tools available for facilitating service access are not often evident to those most in need of those resources and tools. New urban migrants living in the fringes of the ger area are less likely to have the means than city-center residents to get up-to-date information to improve their access to health and essential services. Therefore, targeted, in-person outreach activities for communities identified within the vulnerability assessment as having the highest risk factors will provide the most benefit. Furthermore, certain demographics such as low-income, low-education, elderly, and low-tech rural communities will also benefit in the same way from targeted outreach and awareness activities.

FUTURE DIRECTIONS AND POTENTIAL SCHEMATIC

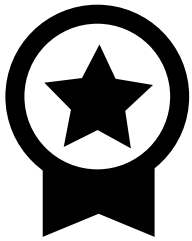


Nation-wide, functioning health service information portal and mobile app



Public awareness, engagement to create, promote usership

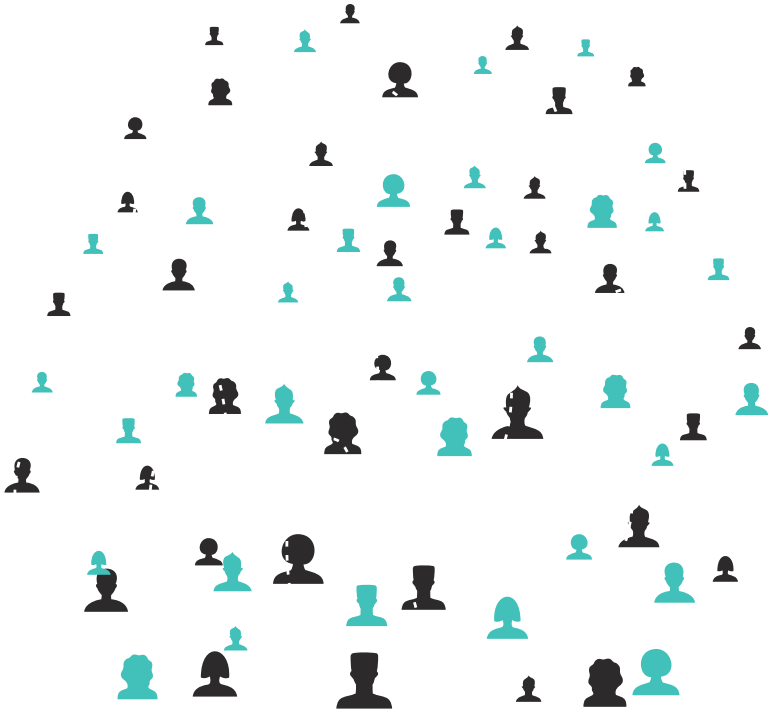
Stakeholder engagement to ensure data quality and update



Useful to public, up-to-date, comprehensive health service database

Health service provider usership and continued data update

Health service review and increased incentive for public and service provider usership



Public usership of the health service information portal and mobile app

APPENDICIS

1. Data: Spreadsheet of data
    a. Master list of health services data
2. Tools and Methods used to generate data
    a. QGIS
    b. OpenStreetMap
    c. Hot Tasking Manager
    d. ArcGIS Pro
    e. Collector for ArcGIS
    f. ArcGIS Survey123
    g. ArcGIS Online
    h. Garmin GPS
    i. Mavic 2 Pro Drone???
    j. Microsoft office 365
3. List of events and workshops conducted - attached as separate document

Project Lead	Event Title	Date(s) Held (if multiple days, input starting date)	Event location (address or city)	Facility used for event	Short description of event purpose	Number of attendees	Number of males	Number of females	Attendee titles/professional or academic positions (if more than one, subdivide entries with semicolon)
Erdenetsogt Sumiyasuren	GeoVolunteer 2020	10/13/2020	Ulaanbaatar	Remote	mapping settlements, road, buildings and fences	69	NA	NA	N/A
Erdenetsogt Sumiyasuren	Mapathon with The Asia Foundation office in Mongolia	12/17/2020	Ulaanbaatar	Zoom,	Organize Mapathon with The Asia Foundation office in Mongolia	13	1	12	Project managers; Project coordinators
Erdenetsogt Sumiyasuren	Mapathon with NEMA officers	1/5/2021	Ulaanbaatar	Zoom	Organize Mapathon with NEMA office from 21 Provinces, to check all the healthsites and essential services in Open Street Map, it's very useful for general public during the COVID-19 pandemic	45	30	15	NEMA officers
Erdenetsogt Sumiyasuren	Community Mappers Mapathon	1/5/2021	Ulaanbaatar	Zoom	To improve base map of UB city	14	6	8	Government officer; Geography teacher; construction engineer
Erdenetsogt Sumiyasuren	Geo Night	4/9/2021	Ulaanbaatar	Zoom	organize mapathon with Community mappers from France and Ulaanbaatar to improve base map of UB city	10	2	8	Volunteers, Govt officer, and teachers
Erdenetsogt Sumiyasuren	Youth Mappers-2021	4/19/2021	Ulaanbaatar	Zoom	The Youth Mappers 2021 data entry internship program is to improve base map of UB city	40	15	25	University Students
Erdenetsogt Sumiyasuren	Mapathon with EFP Alumni	2/12/2021	Ulaanbaatar	Zoom	to improve base map and introduce project	13	5	8	Environmental volunteers and specialists
Erdenetsogt Sumiyasuren	UN World Data Forum	10/6/2021	Virtual	Zoom	UN World Data Forum: Citizen-generated data for COVID-19 response: Incorporating open data in micro-planning for vaccine equity	50	25	25	Professional; Academic
Erdenetsogt Sumiyasuren	Group Discussion with Govt agency MMDRA	6/25/2021	Ulaanbaatar	in Person	Group Discussion with Govt agency MMDRA on scope of collaboration	5	2	3	Govt agency leaders and staffs
Erdenetsogt Sumiyasuren	Monthly Geo-Talk by MGA	5/11/2021	Ulaanbaatar	Clubhouse; Zoom	Introduced the C2M2 project goal and expected outcomes on Monthly Geo-Talk by MGA	15	10	5	GIS professionals, students
Erdenetsogt Sumiyasuren	Improving health services access through digitization (Stakeholder awarness event)	12/1/2021	Ulaanbaatar	In Person	The purpose of this event is to share experiences and discuss opportunities for collaboration with key health and data sector stakeholders to improve access to health and medical services through open data and digitalization.	35	10	25	Health sector officials, International organizations, US Embassy, Start Ups, NGOs

Organization(s) in attendance (if more than one, subdivide entries with semicolon)	Type(s) of organization(s) present (check all that apply)	Event length (in hours/days)	Type of activity (check all that apply)
Mostly individuals, and a few organizations who did mapathon before lockdown	Nonprofit, Local civic organization	3 months - Oct 13, 2020 - Jan 17, 2021	Data collection
The Asia Foundation	Nonprofit	3 hours	Data collection
local NEMA offices	Municipal government	3 hours	Data collection
Community mappers participants	Academic, Municipal government, Local NGO	3	Data collection
Public Lab Mongolia, CarTONG	Local NGO, Nonprofit	3 hours	Data creation
Mongolian university of life sciences, Public Lab Mongolia	Academic, Local NGO	14days	Data creation
EFP Alumni, Public Lab Mongolia	Academic, Local NGO	3hours	Data creation
HOT OSM	Academic, Local NGO, Nonprofit	3hours	Informatio n session
MMDRA, PLM	Municipal government, Local NGO	2hours	Informatio n session
Mongolian Geospatial association, Engineer Geodesy LLC, and PLM	Local NGO, Private Sector	2hour	Informatio n session
National Emergency Management Agency; Center for Health Development; Medical Care Service Department of the Ministry of Health and Project Director of COVID-19 and E-Health Projects	Academic, Municipal government, Local NGO	4hours	Informatio n and Discussio n senssions