



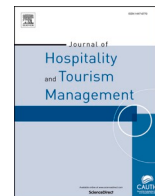
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Who are vulnerable in a tourism crisis? A tourism employment vulnerability analysis for the COVID-19 management

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ABSTRACT

Providing targeted support to people who are mostly impacted financially is critical in managing the socio-economic impacts of the COVID-19 pandemic; however, governments face the challenge of pinpointing vulnerable workers. Building upon the multi-regional input-output model and a high-resolution employment profile, this research develops a new analytical model to recognize the vulnerable population in a crisis by identifying who they are, where they work and what sector they work for. The model was applied to Indonesia to assess tourism losses and found four regional hotspots where the employment vulnerability of women, youth and low-education workers was more than five times higher than the national average. Findings demonstrated that this model could assist with rapid and efficient targeted support for crisis management in the short term and continued investment for an equitable disaster recovery in the future.

1. Introduction

The shock of the COVID-19 pandemic to the travel and tourism industry is unprecedented. In 2020 alone, international tourist arrivals declined by 74%, and domestic tourism was also significantly reduced (UNWTO, 2020d). This led to an export revenue loss of US\$910 billion to US\$1.2 trillion, which places 100–120 million tourism-related jobs at risk (UNWTO, 2020a). The impact of tourism unemployment, at the scale of half-a-million jobs possibly being lost per day, is eight times larger than that experienced during the 2008 global financial crisis (UNWTO, 2020d).

To mitigate the socio-economic impacts of this global tourism crisis, significant and swift government measures have been implemented to support the tourism sector (Khalid et al., 2021). Amid all government financial measures, the United Nation World Tourism Organization (2020e) and the World Travel and Tourism Council (2020) have called for one priority—protecting the livelihoods of workers—and the first step is to “incentivize job retention, support the self-employed and protect the most vulnerable groups” (UNWTO, 2020c).

While this priority is widely recognized, governments face the challenge of identifying the most vulnerable groups and designing a subsidy policy to facilitate the targeted support. Worldwide, the current

financial measure for the travel and tourism jobs is broadly applied with around 100 countries implementing some level of subsidies to small and medium tourism enterprises and self-employed workers across the country (UNWTO, 2020b). This high-level nationwide subsidy program, however, is unlikely to be long-lasting as the huge number of workers will quickly deplete the budget. With the prolonged COVID-19 mobility measures and the uncertainty of the tourism sector recovering in the short term, an imminent task for government is to channel the limited resources to provide direct support to those who are most financially impacted (UNWTO, 2020c).

Currently, governments rely on the economic impact analysis to identify reduction of employment and income across the economy. The standard economic impact assessment reports a total number of workforces impacted without giving a detailed account of employment vulnerability across groups. This can be seen in the current COVID-19 assessments on tourism, with the example of World Travel & Tourism Council WTTC (2020) having evaluated 197.5 million tourism jobs being lost, and OECD (2020) having assessed 6.6–11.7 million unemployed in the European region. Aggregated job figures are also being reported at the national level: 1.7–2.7 million jobs in Japan (Kitamura et al., 2020), 3.32% to 3.58% of jobs in Australia (Pham et al., 2021), and 2.1%–6.4% of employment in Greece (Mariolis et al., 2020). While

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these figures are important to inform the magnitude of the economic shock to tourism employment, they have limited capacities to appraise which groups are subject to a higher financial burden across the large pool of the tourism workforce. Without a detailed job vulnerability analysis, the standard economic impact assessment falls short in informing the design of a targeted support package.

The purpose of this study is thus to develop and test a new analytical model to analyse tourism employment vulnerability during the COVID-19 pandemic. The developed model integrates the multi-regional input-output model with a high-resolution employment profile to better understand how tourism losses affect local employment from the socio-demographic, sectoral, and regional perspectives. In particular, we adopt two indicators: tourism employment losses and the tourism unemployment rate to define the tourism employment vulnerability. Employment losses proxy *risk potential* and the unemployment rate captures *coping capacity*. Based on a case study of Indonesia, this high-resolution employment risk analysis demonstrates how the proposed model can quickly identify the vulnerable labour force segments by pinpointing who they are, where they work and what sector they work for. This information has a great potential to assist governments in strategically designing and planning for the employment targeted support package for the COVID-19 pandemic and for future tourism crises.

2. The employment vulnerability model

Not all tourism workers bear the same level of financial vulnerability in the face of a crisis. The level of financial burden can be proxied through employment vulnerability, defined as “how hard it is for individuals to manage the risks or cope with the losses and costs associated with the occurrence of risky events or situations” (Bocquier et al., 2010, p. 1297). In the context of COVID-19, the drastic reduction in tourism demand implies that tourism employment vulnerability ties strongly to (1) risk and exposure—the unemployment and wage loss potential, and (2) coping—an employee’s ease of re-employment (Bazillier et al., 2016). A person’s employment vulnerability is deemed high if he/she is more susceptible to lay-offs (high risk potential) while being unable to be re-appointed after a job loss or earn additional income to supplement their reduced earnings in the current position (low coping capability).

The risk likelihood of unemployment and related coping capabilities link strongly with employees and their job characteristics, which are sector- and region-specific (Hill & Narayan, 2020). Women, youths, and low-income, low-skilled groups are found to endure disproportionately more economic hardship with higher unemployment rates and higher pay cuts than their counterparts in the COVID-19 pandemic (Henehan, 2020; Lekfuangfu et al., 2020). One critical factor of this outcome is that these vulnerable groups are overly represented in positions that are informal, have low wages, lack a formal contract, are self-employed or individual entrepreneurs, and are in micro or small businesses (Kartseva & Kuznetsova, 2020). Especially, low-skilled, casual and temporary workers are deemed the first to lose their jobs among the tourism labour force during pandemics (UNCTAD, 2020).

Whilst these groups face a high level of economic uncertainty, their chances of being re-appointed in a new position in the short term are relatively limited. Since the start of the COVID-related restrictions, telework has become a direct measure to protect employees and safeguard their economic welfare (Belzunegui-Eraso & Erro-Garcés, 2020). Telework, however, requires employees to have adequate technological capabilities to enable them to work comfortably within information and communications environments. However, low levels of education, inadequate vocational training programs and an increasing skills deficit due to digital advancements among tourism employees make them harder to locate new ‘teleworkable’ positions, and hence such workers are more economically vulnerable in this health pandemic (Shibata, 2020).

Besides job-specific characteristics, the employment risk of individuals is also influenced by the macro-level development. The

complexity of economic structures, the reliance of tourism revenue, and the penetration of telework make tourism employment vulnerability geo-specific. In general, employees face more financial challenges if they have worked in regions with a significant reliance on tourism, with a simplified economic structure and with a low capacity to switch into a telework-dominant system (OECD, 2020). Essentially, the heterogeneity of employment vulnerability across all tourism workers is moderated by social-demographic characteristics, sectoral structure, and regional factors.

To capture these elements in the assessment, the proposed economic model has the following two features. First, it integrates high-resolution employment data with total jobs disaggregated by sociodemographic variables, sectors, and regions. The employment profile identifies, for example, the number of female employees in the hotel sector in region A vs those in the food sector in region B.

Secondly, to proxy employment vulnerability, the model adopts two indicators: the absolute number of jobs that are at risk and the unemployment rate among the same cohorts who are employed in the region. Absolute job losses represent the level of *risk and exposure*, evaluating the total number of people whose livelihoods are at risk due to a reduced tourism demand. On the other hand, the unemployment rate indicates how likely these individuals can be re-employed in the short term, to reflect their *coping capacity*. High unemployment rates not only signal massive job loss but also proxy the difficulty for people to find new positions due to the fierce competition among unemployed workers with a similar skill set.

3. The analysis

The multi-regional input-output (MRIO) model is the backbone for the job risk analysis due to its superior capacity to fully capture the inter-industry linkages across regions and sectors of an economy (Kitzes, 2013; Leontief, 1970; Miller and Blair, 2009). In addition, the model can be easily integrated with an employment profile (referred to as the ‘employment satellite account’) to link inter-regional transactions and labour inputs with their socio-demographic characteristics. The reduced spending from international tourists, for example, can be assessed with job losses for employees who are female living in Bali province and Jakarta-capital, Indonesia, respectively.

To calculate the economic impact of the reduced tourist spending on workers, the following standard input-output formula is adopted:

$$\hat{Q} = \mathbf{q}(\mathbf{I} - \mathbf{A})^{-1}\hat{\mathbf{y}} = \mathbf{q}\mathbf{L}\hat{\mathbf{y}}$$

where \hat{Q} is the impact on labour, \mathbf{A} is the domestic input coefficients of the matrix, $\hat{\mathbf{y}}$ is the relative reduction of tourist spending, \mathbf{L} is the Leontief inverse matrix representing structural interdependencies, \mathbf{q} is the labour intensity (job/revenue, and is differentiated by women, youth, low education, and low-income categories) (United Nations, 1999). In this study, a 17-sector, 34-province multi-regional input-output model was constructed with an employment satellite account created based on the Indonesian National Labour Survey (Statistics Indonesia, 2020c) by gender, age, education, and income status. Tourism spending losses ($\hat{\mathbf{y}}$) from January to September 2020 were estimated based on the Indonesia tourism satellite account, assuming that, if the COVID-19 pandemic had not occurred, the tourism demand in Indonesia would have had no change from the baseline of 2019.

4. Result

Similar to other tourism-dependent destinations, Indonesia experienced a drastic reduction of tourism demand during this pandemic. Based on the reduced numbers of international and domestic travellers, we estimated a total loss of US\$ 14 billion (Rp 201.85 trillion) for the Indonesia tourism industry from January to September 2020.

The multi-regional input-output model estimated that the reduced

visitor spending, US\$14 billion, will directly place 1.8 million jobs at risk. If the supply chain impact was included, the total impact on employment would have amounted to 3.4 million workers, leading to a reduction of 2.6% of nation-wide employment. Across the economy, accommodation and food service incurred the largest job losses, accounting for 31% of the total employment reduction, followed by retail and wholesale (27%), and service activities (17%). The standard economic impact analysis generally would stop at this stage, providing an aggregate estimate of the workforce by sectors that is being impacted (top graph in Fig. 1).

With the proposed model, we are able to pinpoint hotspots where the workers are directly and indirectly affected by tourism losses and are subject to higher employment losses and a high unemployment rate. The model starts with the national figure of 3.4 million jobs at risk, followed by a regional analysis demonstrating the uneven impact across provinces whereby seven regions contributed to 75% of the total tourism-related unemployment. Mapping the unemployment to the socio-demographic groups further confirmed that female, youth (15–27 years old) and low-education workers (with the highest education being elementary school) were disproportionately affected. Among these at-risk jobs, 1.63 million jobs were held by women; 755,000 jobs were for youth; 1.12 million jobs were for low-education workers; and 541,000 jobs were for low-wage occupations. This translates to 3.1% of female workers, 2.7% of youth employees, 3.1% of low-education staff, and 2.3% of low-income workers who will face high job insecurity.¹

Based on the proposed model, two criteria—total jobs at risk and an unemployment rate exceeding 10% within the cohort—were used and four tourism-reliant communities and those who were most in need were then identified (the bottom graph in Fig. 1), including:

- Bali – 820,000 possible job losses and the unemployment rate for youth, women, low-education and low-income workers having exceeded 30% in the region. Around 40% of job losses incurred in the retail and wholesale sector.
- Yogyakarta – 242,000 possible jobs losses, and the economic risks for women, youth and low-income workers being five to six times higher than the average across the country. Retail and wholesale incurred the biggest losses (40%).
- Nusa Tenggara Barat – 204,000 possible job losses, and the economic burdens expected to be more prominent for female workers and low-education workers with a 10% unemployment rate. One-half of the total employment reduction worked in accommodation and food service.
- Kepulauan Riau – 114,000 possible job losses, and one in every six low-income and female workers expected to endure significant jobs and income losses, and one in every three unemployed was reported in the accommodation and food service.

It is important to note that significant differences in job vulnerability are observed across regions, sectors and sociodemographic groups. Using the unemployment rate as a basis, we found youth and female workers are exposed to a higher economic risk in Bali and Yogyakarta while low-education workers in Nusa Tenggara Barat and low-income workers in Kepulauan Riau are the most vulnerable. Local economic structure and the composition of the labour force contribute to this heterogenic job vulnerability, which is clearly identified in the proposed model.

5. Discussion and conclusion

To effectively manage and mitigate COVID-related social impacts, strong and valid evidence is needed to guide policy measures toward people who are mostly in need. The standard economic impact analysis

generally reports job losses by an aggregate figure, and lacks the critical information to identify which community and which subgroup of the workforce are most economically vulnerable. This paper contributes to the literature by proposing a high-resolution job analysis that maps employment losses to geographic regions, sectors, and socio-demographic groups. Conceptually, we define employment vulnerability at the macro level using two key constructs – total employment loss to proxy economic risk and exposure, and the unemployment rate in the cohort to indicate the coping capacity of being re-appointed. The tourism industry struggles to prepare itself for and adapt to various disasters (Möller et al., 2018). The proposed model will empower policy makers to offer a rapid and efficient economic relief package in the short term, and to facilitate an inclusive recovery for procedural, distributive and retrospective fairness in the long term (Rastegar et al., 2021).

Findings of Indonesia suggest important considerations when designing a targeted support package for tourism recovery. First, the geographic breakdown is warranted given most countries experience a highly uneven distribution of tourism demand across regions (Rogerson, 2015; Wang et al., 2015). The consideration therefore needs to go to places that attract a high volume of tourism expenditure (flag-ship destinations) and to small communities that are highly dependent on tourism, even if their tourism revenue is relatively small. Secondly, it is important to recognize that not all tourism workers bear the same level of financial burden. Distributing subsidies without a selective process is likely to quickly deplete the government budget without achieving the best relief outcome. Those who endure more financial hardship are generally employed in informal positions, have low wages, and are self-employed or in micro or small businesses. These positions are overly represented by females, youths, and low-education and low-income workers, as demonstrated in our Indonesia analysis.

As the targeted support is found to effectively address inequality in disposable income (Jurzyk et al., 2020), we suggest a sectoral-, regional- and worker-specific relief policy in the short term. Directing central funds to the regional level to assist with wage compensation, unemployment subsidies, in-kind transfer, or job relocation for a subset of the workers will provide the much-needed assistance. In the long term, strengthening the coping capacities of tourism workforces is required. Programs are called for to upskill, reskill and multi-skill the current tourism workforce through innovation and digitalization. Although many Indonesian women are digitally connected, business owners and workers continue to lag behind in terms of their digital skills. Building capabilities in digitalization through vocational, on-the-job trainings or on-line training are a ‘must’ for all affected employees (UNICEF et al., 2021). Overall, these labour policies need to go hand-in-hand with subsidies that help tourism business survival. Low-interest loans and tax relief to small and medium tourism enterprises in the most affected provinces constitute an effective way of supporting the businesses (OECD, 2020).

It is important to note that the proposed model is operated within a linear assumption (Miller & Blair, 2009). A fixed ratio between tourism losses (recovery) and job losses (creation) is assumed. The model implies that once tourism recovers, people will find jobs immediately and the subsidy program can stop. With a plummeting labour force participation rate among women and youth workers (UNICEF et al., 2021), how fast these disadvantaged cohorts can get back to the labour market remains unknown. Future research on the systematic monitoring and reporting of new jobs by regions, sectors and demographic attributes is called for. The observation will be important to profile the job recovery status and advise the optimal timing for phasing out the subsidy program. In addition, the study reflects an important need to respond and manage crises from a systemic perspective (Scott & Laws, 2006). Tourism demand, local economic structures and labour compositions present a complex job vulnerability, which has not been sufficiently recognized and studied within the tourism crisis management literature.

In conclusion, our analysis demonstrates the need for destinations to establish a detailed employment profile to capture the heterogeneity of

¹ Additional results are available upon request.

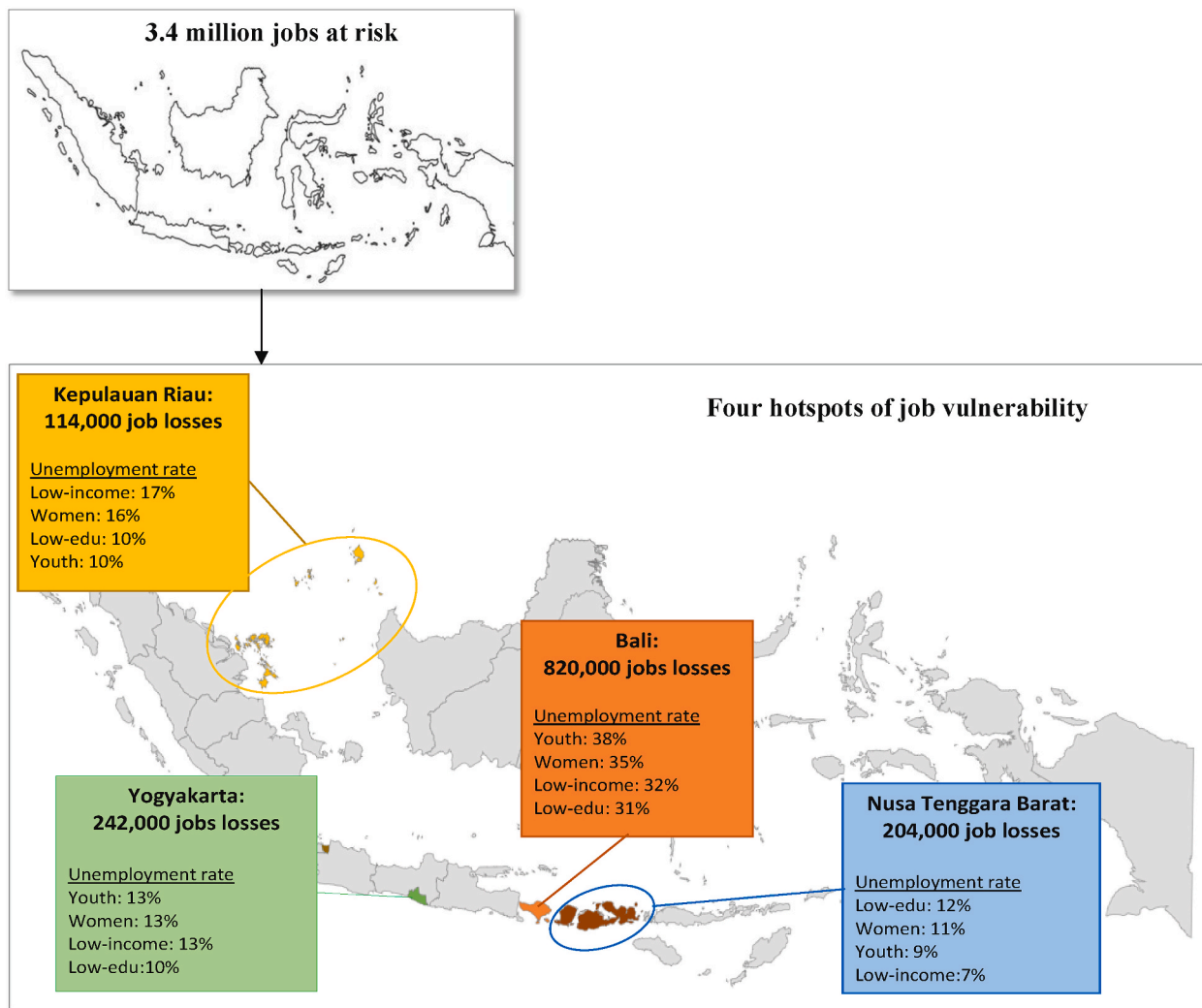


Fig. 1. Job vulnerability in Indonesia due to tourism losses, Jan to Oct 2020.

Note: The top figure presents the number of total jobs at risk. The bottom section identifies four hot spots where the regions experienced the most job losses with the highest unemployment rate across four demographic groups.

employees among tourism businesses and their suppliers (Kronenberg & Fuchs, 2021). Most tourism statistics, such as the Tourism Satellite Account, are not equipped with an employment profile (Jones & Munday, 2008; Liberos et al., 2006), and thus are unable to reflect the unique local labour structure and job opportunities that are affected/offered by tourism businesses, directly and indirectly. The inclusion of gender, age, education, income, disability, migrant status, and race in the economic model provides great potential for important policy insights as these factors are found to be correlated with the asymmetrical financial vulnerability that workers have experienced globally (Montenovo et al., 2020; UNCTAD, 2020). This will become an invaluable foundation for the design of an efficient and inclusive recovery policy in crisis management.

Declaration of competing interest

None.

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Appendix A. Supplementary data

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.jhtm.2021.08.014>.

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