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Penelitian dan Pencapaian"
Health and Safety Hazard Identification and Risk Assessment of Tourism Areas in Bali

I Md Ady Wirawan¹, I Made Kerta Duana¹, Ni Made Dian Kurniasari¹, Wayan Citra Wulan Sucipta Putri², Ketut Hari Mulyawan¹, Christian Suharlim³

¹School of Public Health, Faculty of Medicine, Universitas Udayana, Bali, Indonesia
²School of Medicine, Faculty of Medicine, Universitas Udayana, Bali, Indonesia
³Harvard T.H. Chan School of Public Health, Boston, USA

Phone: 081239394465, e-mail: ady.wirawan@unud.ac.id

Abstract

Background: The number of international travelers to Bali has increased significantly. This increasing trend has been accompanied by the rise in travel related morbidity and mortality. Currently available travel health surveillance system relies on ill-returned traveler’s data and has been mainly designed for country of origin at developed nations. This study aims at developing an integrated travel health surveillance and information system for destination areas in Bali.

Methods: The first phase of the study included mapping and geotagging of health hazards and risks at tourism areas as well as health facilities nearby. Hazard identifications were performed and health risks were assessed using qualitative risk assessment chart. Data were collected using the Open Data Kit software.

Results: Two hundred tourism spots in 8 regencies and 1 municipality in Bali were included. The health and safety hazards were mapped based on geo-points identified, and connected to the surrounding health facilities. Of the 197 spots observed, 6 main hazard groups were identified including mechanical, physical, biological, ergonomic, psychological, and chemical hazards. Health and safety risks were presented descriptively in this study, including the preventive measures already in place.

Conclusions: The first phase of the study has been able to generate a comprehensive database of health hazards, risks, and health facilities at tourism areas in Bali. This finding will be the basis for the next phase of the study where a system accessible through mobile handheld device will be developed to foster a travel health network in Bali involving private and public sectors.

Keywords: Healthy Tourism, Safety Hazard, Risk Assessment, Destination
Health and Safety Hazard Identification and Risk Assessment of Tourism Areas in Bali

- dr. I Md. Ady Wirawan, MPH, Ph.D
- I Made Kerta Duana, SKM, MPH
- Ni Made Dian Kurniasari, SKM, MPH
- dr. Wayan Citra Wulan Sucipta Putri, MPH
- Ketut Hari Mulyawan, S.Kom, MPH
- Dr. Christian Suharlim, MD, MPH

PSKM FK Universitas Udayana & Harvard School of Public Health

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Outline

Background
Aims
Research Road Map
Research Methods
Results and Discussions
Number of international travelers to Bali has increased significantly. The increasing trend has been accompanied by the rise in travel related morbidity and mortality.

Background

- Travelers are considered an important population from epidemiology point of view due to their mobility, and risks of importing and exporting diseases.
- Currently available travel health surveillance system relies on ill-returned travelers data and has been mainly designed for country of origin at developed nations.
Aims: Developing an integrated travel health surveillance and information system at destination (TravHeSID)

- Mapping health hazards and risks at tourism areas in Bali
- Mapping facilities that provide travel health services in Bali
- Developing items for providing area-specific travel health information
- Developing a system that enables travelers to access specific travel health information at tourism areas, health facilities nearby, and report symptoms or illness through mobile handheld device.
- Conducting implementation research to assess effectiveness of the new system

TravHeSID Research Road Map

**Phase I**
- Mapping health hazards and risks at tourism areas
- Mapping facilities that provide travel health services
- Develop items/factors for providing area-specific travel health information
- Assessing feasibility and acceptability of using a surveillance system accessible by travelers and health facilities through mobile handheld device (may include mobile application, SMS, push notification, etc)
- Developing a system that enables travelers to access specific travel health information at tourism areas, health facilities nearby, and report symptoms or illness through the mobile handheld device (ex: appointment system)

**Phase II**

**Phase III**
- Implementation research comparing areas which are included in the systems and areas which are not
Research Methods

Year 1:
Mapping health hazards at tourism areas
Mapping facilities that provide travel health services
Risk Assessment

- Hazard identification: descriptive study using observations, interviews, hazard level measurement.
- Initial geotagging of sites will be performed using global positioning system, including coverage of the sites.
- Open Data Kit (ODK) Collect
- Risk assessment: descriptive study using qualitative risk assessment tools
- Sites: 8 regencies and 1 city, with 198 tourism areas

Risk Assessment Chart

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Results and Discussion

Kawasan wisata di Bali
Kawasan wisata dan faskes di bali

Kawasan wisata dan jarak ke faskes
Main hazards

6 main hazard groups were identified including:

• Mechanical hazard – slips/trips/falls, drawing
• Physical hazard – climate, sun
• Biological hazard – vector, rabid animals
• Ergonomic hazard – equipment handling, layout
• Psychological hazard – stress, hassle
• Chemical hazards – smoking, alcoholic beverages (methanol)

Main tourism categories

• Agro tourism
• Hot spring
• Waterfall
• Lake
• Tourism Village
• Mountain, Hill
• Tourism forest
• Zoo, Conservation

• Museum
• Beach
• Art Market
• Temple
• Rice field
• River, Rafting
• Cliff
• Monument
• Amusement Park
Risk Assessment*

- Low Risk : 50.9%
- Medium Risk : 37.3%
- High Risk : 11.8%

*Temporary analysis

Conclusion

- The first phase of the study has been able to generate a comprehensive database of health hazards, risks, and health facilities at tourism areas in Bali.
- This finding will be the basis for the next phase of the study where a system accessible through mobile handheld device will be developed to foster a travel health network in Bali involving private and public sectors.