Universities' Preparedness and Response Towards Multi-Hazards:

COVID-19, Natural, and Human-Induced Hazards

Universities' Preparedness and Response Towards Multi-Hazards:
COVID-19, Natural, and Human-Induced Hazards

About this publication:

This publication is developed by a group of individuals from the International Institute of Disaster Science (IRIDeS) at Tohoku University, Keio University (Japan) and Tsinghua University (China), in collaboration with the Association of Pacific Rim Universities (APRU) Multi-Hazards Program.

This publication is not the official voice of any organizations and countries. The analysis presented in this publication is of the author of each innovation.

Team members:

Takako Izumi (IRIDeS, Tohoku University)
Rajib Shaw (Keio University)
Hui Zhang (Tsinghua University)

How to refer this publication:

Please refer to this publication as follows:

Izumi, T.; Shaw, R.; Zhang H.; (2021): Universities' Preparedness and Response Towards Multi-Hazards: COVID-19, Natural, and Human-Induced Hazards by IRIDeS, Keio University, Tsinghua University, Japan, 79 pages.

March 2021

Foreword

The entire world has experienced systemic shocks and personal tragedy from the novel coronavirus from early in 2020. It continues to have a major impact on health, the economy, and livelihoods despite efforts to limit its spread and to develop effective vaccines and treatments. The pandemic led us to realize that severe risks can derive from human-induced threats from our relationship with the natural world beyond what we regard as normal natural hazards. Since most current risk reduction measures predominantly focus on natural hazards, it is clear now that they need to be reviewed and improved to incorporate the reduction of risks caused by these new threats.

The Association of Pacific Rim Universities (APRU) is a network of 56 universities located around the Pacific Rim. APRU jointly established the Multi-Hazards (MH) Program with Tohoku University in 2013 to strengthen research capacity in disaster science and contribute to international and regional discussions on disaster risk reduction. Its secretariat has been hosted by the International Research Institute of Disaster Science (IRIDeS) of Tohoku University. The IRIDeS leads disaster science research and has been successfully contributing to the recovery efforts in affected areas to build sustainable and resilient communities.

One of the MH program's major activities is "the campus safety program" which aims to review campus safety measures and learn from the experiences of member universities. Universities have been severely affected by the COVID-19 pandemic. Many universities encountered issues in welcoming students back on campus. Further, they faced financial challenges caused by a decrease in students from overseas. They have made tremendous efforts to continue providing high-quality education to students online and through other methodologies. This has highlighted the importance of preparing for such risks and building resilience.

Our member universities face various obstacles in tackling and recovering from these unprecedented challenges. Hence, it is crucial to record these significant experiences, share them with other universities, and learn from them. Above all, we hope that the COVID-19 pandemic will be rapidly resolved and that we will be able to resume our regular education programs, active discussions and learning, as well as campus lives. We hope that this publication will facilitate learning from each other's experiences and strengthening current campus safety through disaster risk reduction activities on campus.

Christopher Tremewan
Secretary General,
Association of Pacific Rim Universities
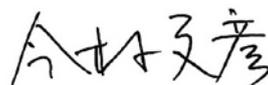
Fumihiko Imamura
Director,
International Research Institute of Disaster Science, Tohoku University

Preface

The experience of the COVID 19 pandemic reminded us that hazard risks are not only natural, but also include different types of hazards such as biological, chemical, industrial etc. It is crucial to understand these various types of hazard risks and take proper preparedness measures to ensure effective response efforts.

The scope of the Sendai Framework for Disaster Risk Reduction, adopted at the United Nations World Conference on Disaster Risk Reduction in 2015, emphasizes that *"the present framework will apply to the risk of small-scale and large-scale, frequent and infrequent, sudden and slow-onset disasters caused by natural or manmade hazards as well as related environmental, technological, and biological hazards and risks. It aims to guide the multi-hazard management of disaster risk in development at all levels as well as within and across all sectors."* To support and implement the framework, we are required to incorporate both natural and anthropogenic hazards as well as other types of hazards such as pandemics in our disaster management strategy. Further, we must adopt a comprehensive approach which encompasses all hazards. Universities in particular need to consider adopting this approach as they keep explosive, chemical, and hazardous materials on campus and are responsible for numerous students, staff, and faculty. In addition, the impact on neighboring communities could also be tremendous if any incidents occurred on campus.

The year 2020 was extremely challenging for universities, faculty, and students in education. Due to the COVID-19 pandemic, our regular classes, educational programs, field visits, etc. were tremendously restricted. Students, faculty, and administration staff were struggling to transition teaching and learning methodologies to an online format. The lack of internet access as well as stable connectivity were the fundamental obstacles in many countries. Nevertheless, many universities have overcome these challenges and minimized the damage with innovative and cooperative solutions in such difficult circumstances. It is crucial to learn from these innovative approaches and measures on how universities have been managing this crisis.

The APRU Multi-Hazards (MH) program was jointly established in 2013 with the Association of Pacific Rim Universities (APRU) and Tohoku University in Japan. The campus safety program is a major activity of the MH program. The program includes conducting a survey to understand the status of universities' disaster preparedness, organizing workshops to learn from each other, and compiling this case study to share the experience. At the workshop held early 2020, it was proposed to collect the case studies to learn how universities responded and prepare for the pandemic, and share them especially among university safety/crisis management offices, university staff, and faculty. The idea of this publication derives from the workshop.

The case studies aim to collect the efforts made by universities in the response and preparedness toward the COVID-19 pandemic as well as other hazards such as earthquakes, fires, and anthropogenic hazards. Further, it aims to investigate how to prepare for future pandemics and disasters more effectively. This compilation includes 26 case studies from 13 countries and region. It is critical to keep a record of what happened and success and failures to learn from the experience and prepare for the next hazardous events. We hope that this publication will be useful for universities in strengthening their current strategy and plan to reduce multiple disaster risks and respond efficiently. Further, we believe that it will enable them to

establish a resilient campus against various types of hazards to protect the lives of students, staff, and faculty as well as the assets on campus.

Takako Izumi
Associate Professor,
International Research
Institute of Disaster Science
(IRIDeS), Tohoku University

Rajib Shaw
Professor,
Graduate School of Media and
Governance,
Keio University

Hui Zhang,
Vice Director,
Institute of Public Safety
Research,
Tsinghua University

TABLE OF CONTENTS
Universities' Preparedness and Response Towards Multi-Hazards: COVID-19, Natural, and Human-Induced Hazards

COVID-19

University	BRAC University

Major damage caused by the hazard in general	People infected by the disease, loss of lives, loss of livelihoods, closure of classes, major loss in the education system, loss of benefits from in-person classes, huge loss in the country's economy, for instance, in garment manufacturing and export areas
Major damage / impacts on campus (not only structural damage, but also non-structural such as termination of classes, events, etc.)	• Closure of classes mid-semester with very short notice; • Loss of benefits from in-person classes; • Difficulty in conducting virtual architecture studios and other laboratories that need one-to-one teaching; • Closure of all physical site visits in architecture and disaster management programs; • Postponement of international and national seminars, trainings (DRR), and workshops; • Cancellation of all co-curricular activities; • Abrupt discontinuation of all field-research work; • Physical illness and mental health issues of students, teachers, and staff.
Major preparedness/ DRR measures prior to the hazard at your university	• Temperature readings and hand-sanitizing facilities at the outbreak's onset in every building and department • Awareness posters • Awareness counselling
Response efforts immediately after the hazard at your university	• Temperature readings and hand-sanitizing facilities in every building and every department immediately after the outbreak • Awareness posters • Awareness counselling • Training program • Food and other relief goods supplied to affected people in the neighborhood
Recovery efforts after the hazard at your university	• Training of volunteers by the Disaster Management Program and an awareness campaign in city neighborhoods • Personal initiative of the Department of Architecture and PPDM lead to raising funds for support staff in need
Lessons learned from the event	Not to take these disasters lightly COVID 19 was a slow-onset disaster, and Bangladesh had plenty of time to control it better with more and proper risk reduction measures.
Major changes / improvement in disaster risk management on campus before and after the event	• Campus closure • Introduced online teaching and administration immediately • At the moment (July 4, 2020 onward) a limited number of staff work socially distanced on the physical premises. • Offices are equipped with masks, disinfectants, and thermometers for reading people's temperatures.

Relief Work by Postgraduate Programs in Disaster Management (PPDM)

Zainab Faruqui Ali, Professor, Brac University

CHINA

University	Tsinghua University

Major damage caused by the hazard in general	Physical health and safety of human life, mental pressure and psychological burden, network public opinion, economy, employment, daily work and communication of government departments, schools, enterprises and institutions, aviation and passenger transport, tourism, derivative disasters, etc.
Major damage / impacts on campus (not only structural damage, but also non-structural such as termination of classes, events, etc.)	(1) Health and safety of teachers, students, and staff (2) Mental pressure and psychological burden (3) Network public opinion (4) Education, teaching, and scientific research activities, for example: classes, experiments, practice and training, enrollment, employment, development and promotion of scientific research projects, academic exchange, etc.
Major preparedness/ DRR measures prior to the hazard at your university	(1) Enough medical strength and supplies were reserved. (2) Regulations and emergency plans related to medical and epidemic prevention were issued. (3) A relatively complete mechanism of information submission and release has been established. (4) Daily management of school entrance and exit was implemented. (5) Good cooperation and linkage mechanism with sub-district offices, relevant government units, communities, and hospitals were formed.
Response efforts immediately after the hazard at your university	(1) Implementing responsibility for territorial management and guarding campus safety. ① Establishing a leading organization for prevention and control. ② Closed management of the campus. ③ Cooperating with sub-district offices and communities to achieve prevention and control work. ④ Strengthening management of campus environmental sanitation. (2) Paying attention to prevention and treatment at the same time to protect the lives, safety, and health of teachers, students, and staff. ① Timely release of relevant information on epidemic prevention and control. ② Providing epidemic protection materials for teachers, students, and staff. ③ Stopping campus experimental and practice activities. ④ Helping teachers, students, and staff in difficulties.
Recovery efforts after the hazard at your university	(1) Using information network technology and implementing the responsibility of teaching and educating people. ① Taking the epidemic situation as an opportunity to conduct ideological and political education. ② Implementing network teaching to ensure that instruction is not interrupted. ③ Opening a hotline to provide psychological counselling for teachers, students, and staff. ④ Implementing alternative forms of education around the epidemic situation. ⑤ As the epidemic subsides, teachers, students, and staff should go back to school in a planned, step-by-step way.

Management of school entrance and exit, and campus safety knowledge publicity and education

Online learning, conference and academic exchange

	(2) Conducting scientific research to provide intellectual and technical support for prevention and control of the epidemic situation. ① Establishing a scientific research team to conduct research on virus prevention and control. ② Providing decision support for epidemic prevention and control. ③ Investigating epidemic prevention and control to help at the grassroots level. (3) Improving countermeasures of the public crisis emergency mechanism. ① Establishing a unified and long-term public crisis emergency mechanism. ② Improving corresponding rules and regulations. ③ Strengthening development and application of a campus security information platform. ④ Strengthening the practicability of publicity and education, and cultivating the crisis consciousness of teachers, students, and staff.
Lessons learned from the event	(1) Strengthening awareness of epidemic prevention. ① Strengthening college students' public health and safety education. ② Strengthening the capacity for major epidemic prevention at colleges and universities. (2) Strengthening emergency response capacity. ① Establishing an emergency security mechanism for a major epidemic. ② Strengthening construction of medical and emergency teams. ③ Strengthening construction of early warning and information systems. (3) Improving the level of public opinion control. ① Adopting the public opinion guidance mode matching college students. ② Adopting educational and teaching methods appropriate to the new situation.
Major changes / improvement in disaster risk management on campus before and after the event	(1) Paying more attention to prior management of campus disaster risk (2) Further strengthening cooperation and linkage among various departments of the school (3) Paying more attention to and strengthening the publicity, education, and exercise of public health knowledge (4) Enriching and improving emergency plans related to public health (5) Further improving the school public health emergency management system

(6) In the new era and new situation, paying more attention to deepening development and application of the campus security information platform

Management of school entrance and exit, and campus safety knowledge publicity and education

School leaders investigate and inspect epidemic prevention and control work

Fighting epidemic bravely to ensure a safe and clean school environment

Tao Chen, Professor, Tsinghua University

INDIA

University	Indian Institute of Technology Roorkee (IITR)

Major damage caused by the hazard in general	IITR is located in Uttarakhand State, which, because it lies in Zone IV, is highly vulnerable to multi-hazards like earthquakes, floods, and landslides. Furthermore, due to concerns regarding Tehri Dam's geological stability, estimates predict that a dam burst would submerge numerous towns downstream, including Roorkee City. IITR is a residential campus with 12,000 inhabitants. The current major hazard at IITR is COVID-19, which has led to several changes in operational mode and continued teaching through online platforms.
Major damage / impacts on campus (not only structural damage, but also non-structural such as termination of classes, events, etc.)	• COVID-19 has impacted the campus and city in numerous ways, including the following: the safety of the campus community, access to basic services, classroom learning, financial performance, infrastructure utilization rate and cost, scientific engagement, career opportunities, social equity, psychological status, the informal sector, social life, and quality of life. It has also influenced the neighborhood and campus environment. • Physical classes were terminated in March 2020 and then reorganized through online platforms. Along with students' adjustments, faculty were challenged to shift suddenly and unpreparedly, but seamlessly, from face-to-face to distance teaching and learning. • This shift increased the financial burden on the institute and on individuals, faculty, staff, and students, for instance, investing in online infrastructure, IT related systems, and creation of off-campus learning and teaching support. At the same time, the shift resulted in massive, underutilized infrastructure on campus. • Furthermore, incompatibility of existing space, services, and infrastructure to meet new requirements for safe living and working during the pandemic has created a need for even more investment. The new normal safety requirement has increased the work environment's per-person cost. • Moreover, some students experienced poor Internet connection and Internet unavailability in remote areas, leading to concerns about accessibility and equity. Likewise, due to international travel restrictions, cross-border movement of students was sluggish. • Research activities have been affected by travel restrictions, and research relying on specific technical equipment was hindered. Time-bound, faculty scientific research projects are also in danger of not being successfully completed, and scientific events were cancelled or postponed. • Additionally, the student community had concerns about changing the format of student recruitment and about withdrawal of job offers, thus leading to career uncertainty and psychological stress. Furthermore, sudden uprooting from campus life led to unmet psychological and social needs, making students, faculty, and staff restless. The community felt a sudden loss in social life and quality of life due partly to restrictions on outdoor movements and religious gatherings.

	•Roorkee is an education city where local businesses largely depend on the student population. Absence of students affected the city's economic and social ecosystem. Furthermore, the informal sector of campus—rickshaw pullers, dom estic help, construction workers, and other daily wage earners—were one of the communities the worst hit by COVID-19, because, due to mobility restrictions, employment and income were lost.
Major preparedness/ DRR measures prior to the hazard at your university	• Since the Institute lies in seismic Zone IV and is prone to earthquakes, there, the Centre of Excellence in Disaster Mitigation & Management and various departmental research laboratories have been established; these are equipped with state of the art equipment and work actively in disaster mitigation and management. • Many projects and consultancies have been undertaken by faculty, students, and researchers in soil testing, seismic analysis, building design, modelling and management of floods, development of algorithms for earthquake early warning systems, and other similar areas of study. Research in these areas has ensured that all Institute structures are earthquake resistant. • The Institute has a disaster emergency plan for communication and electricity backup, and emergency fire drills for residents are conducted regularly. All structures are equipped with drainage, electricity, fire alarm systems, sprinklers, fire extinguishers, and signage boards for information dissemination. The Institute has established online support portals such as estate and works, network, software, hospital, email, employee portal, and guest house booking. • Students, faculty, and staff are familiar with an alternative mode of education in emergencies. On campus, stable Wi-Fi and LAN Internet access is always available to students and faculty. Wellness support services are in place for students, staff, and faculty when they need physical and psychosocial support during and after emergencies.
Response efforts immediately after the hazard at your university	• Early warning about COVID-19 was shared with the campus community, and classroom teaching was suspended. Initially, commercial establishments on campus were closed but were soon operational again, with restricted timing and app-based shopping with a home-delivery option. A supply of essential food items was regularly available on campus in coordination with District Administration and Mandi Samiti. A schedule of campus sanitization and fogging was developed, and restrictions on outsiders were followed. • A work from home policy was effected for all faculty, students, and staff to ensure continuity of academic activities; a strategy for the semester evaluation process and a grading system were developed to ensure that students progress normally though a full course of study. Information on various educational tools, such as online lecturing, was provided to faculty. Regular updates, videos, webinars, guidelines, and manuals on different educational tools/modes were also available. IT remote access to e-Resources for seamless learning, and an IT recovery plan was developed. SPARK and DIC summer student internships were converted into distance internships to

facilitate safe research and learning practices.

- Guest houses were converted into quarantine centers for incoming persons. Special measures by the Institute hospital committee were undertaken to test and monitor Institute/home quarantined persons.
- Community action increased to organize camps to provide a regular supply of food for local daily wage earners. The student community initiated an action to provide relief to the informal sector of the campus by distributing essential items.

Recovery efforts after the hazard at your university	• Clear, effective communication streams to staff and students were implemented regularly about critical emergency information, such as safety instructions, updates on the current situation, changes in access routes, and monitored entry to campus premises. Moreover, the institute's susceptibility to cybercrime was overcome by strengthening security against cybersecurity vulnerabilities and attacks. • Development of robust teaching systems was introduced to ensure safety and hybrid learning and to mix synchronous with asynchronous learning. To ensure that all students received equal attention in online classes, accommodations were made in modes of connectivity. Extension of support was provided to students and faculty to cope with the situation, and special grants were provided to set up home offices. • The Institute ccontributed to public policies either through institutional leadership or through research. Senior management and faculty have been consulted by public and government officials on public policies relating to COVID-19. Incredible innovative approaches to issues faced and the sector's resilience were undertaken by faculty at IIR: development of Prana-Vayu ventilators; an antimicrobial nano-coating system for facemasks and PPE to reduce transmission risk; development of software that can detect COVID 19 within 5 seconds using an x-ray scan of a suspected patient; and research into development of a decision support system to help higher education institutes maintain safety and sustainability. • The Design Innovation Centre proposed research for a product scheme (R2P) for faculty to find solutions to COVID -19 and organized a student design challenge for ingenious solutions for campus safety post-COVID 19. Research is being conducted in space design interventions in laboratories, classrooms, offices, and public spaces to maintain social distancing post-COVID-19.
Lessons learned from the event	• In dealing with and recovering from COVID-19, the Institute developed understanding and systems to regularly monitor, improve, and communicate its preparedness, measurement, and scheduled evaluation for disasters of different types. • At the same time, the Institute created a resource pool for humans, knowledge, technology, and finance to address such unprecedented circumstances. Furthermore, it developed partnerships at global, national, and, most importantly, local levels. Likewise, this pandemic taught the need for creating robust and flexible systems to allow quick recovery and facilitation of normal functioning.

| **Major changes / improvement in disaster risk management on campus before and after the event** | The Institute has established a special office and a system of monitoring, evaluation, communication, and partnerships. It has also created a human, knowledge, technology, and financial pool, along with robust and flexible systems for administrative safety, campus safety, classroom learning, scientific engagement, and career opportunities for the entire campus community and the neighborhood. |

Mahua Mukherjee, Indian Institute of Technology Roorkee (IITR)
Harshit Lakra, Indian Institute of Technology Roorkee (IITR)
Sonal Atreya, Indian Institute of Technology Roorkee (IITR)

INDONESIA

University	Universitas Indonesia

Major damage caused by the hazard in general	COVID-19—confirmed cases on campus
Major damage / impacts on campus (not only structural damage, but also non-structural such as termination of classes, events, etc.)	Local infection in offices and at event activities Online learning for all students until the end of 2020 and still on-going until further notice.
Major preparedness/ DRR measures prior to the hazard at your university	1. Conduct activities in population risk assessment 2. Develop protocol Covid-19 prevention for all activities and facilities on campus 3. Reporting and recording procedure for students, staff, and/or guests coming from other cities/countries 4. Building inspection to check compliance with safety requirements, including protocol for COVID-19 5. Provide some COVID-19 prevention equipment and facilities, for instance, PPE, handwashing, hand sanitizer, and signage 6. Conduct screening via body temperature 7. Conduct disinfecting of indoor areas 8. COVID-19 Awareness Webinars 9. Collaboration with Campus Clinic (student medical examinations), Campus Hospital (testing), and local government
Response efforts immediately after the hazard at your university	Contact tracing, swab testing, budget allocation (PPE, disinfectant, handwashing facilities)
Recovery efforts after the hazard at your university	Return-to-work policy including health test and New Normal Polic
Lessons learned from the event	Need for establishing new normal policies that include online events, restriction of offline meetings, and maintenance of inspecting and monitoring new normal activities.
Major changes / improvement in disaster risk management on campus before and after the event	COVID-19 policies in university (goverment regulation-province and national level as reference for Campus COVID-19 Policies)

Disinfecting

Body Temperature Checking

COVID-19 Awareness Webinars
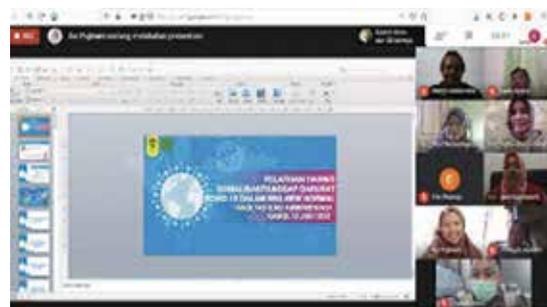
COVID-19 Prevention Facility

Handwashing facility
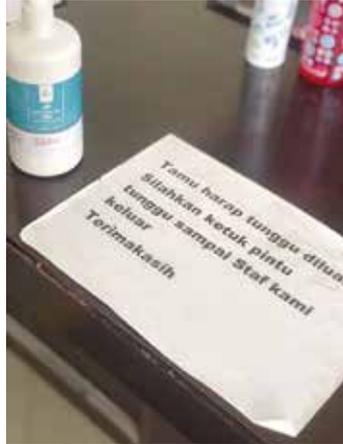
Hand sanitizer

Marks for standing inside elevator

COVID-19-Related Health Promotion Media

Poster of Healthy Lifestyle to Prevent COVID-19 Transmission

Banner of Healthy Lifestyle to Prevent COVID-19 Transmission

How to Wash Hands Properly

Queue-marking Signage

Hand Washing Signage

How to Wear a Mask Properly

Dr. Sjahrul M. Nasri, Universitas Indonesia

MALAYSIA

University	Universiti Malaya (UM)

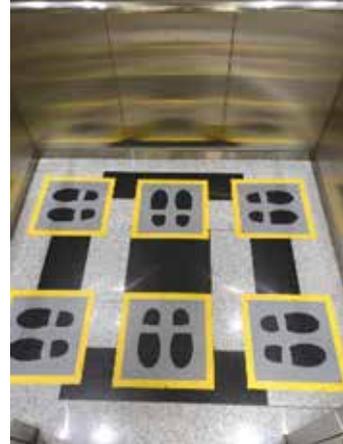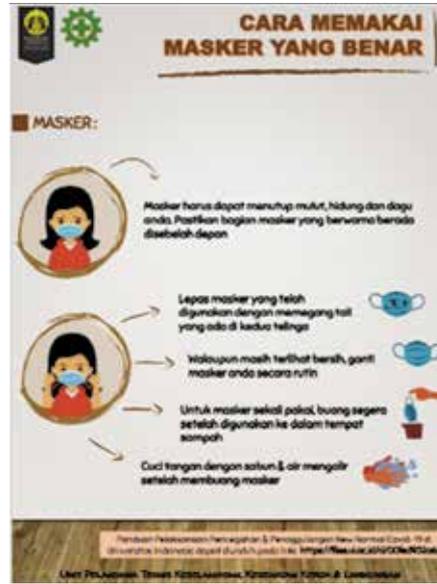| **Major damage caused by the hazard in general**	COVID-19 and the subsequent Movement Control Order (MCO) imposed by the government has deeply impacted the UM. This is potentially catastrophic for UM, which relies on student fees to stay afloat. In this crisis, prospective students are highly likely to delay their studies.
Major damage / impacts on campus (not only structural damage, but also non-structural such as termination of classes, events, etc.)	• The university was forced to make a swift change to online teaching when the MCO was imposed. • Lectures and tutorials have been moved online, ongoing laboratory research has halted, and new student enrollment has been delayed. • Almost all student exchange programs and academic conferences have been cancelled. • While full-time employees face additional pressure to manage disruptions, contractual staff risk unemployment. • Even if students and lecturers can get past the technical difficulties, one cannot assume that students enjoy unlimited Internet access or possess laptops or desktops that allow them to attend online classes free. • Internet coverage and speed vary depending on students' locations and budgets. Therefore, some students, especially those residing in rural areas, do not enjoy sufficiently good Internet access or any access at all. They run high risk of being left behind if classes are conducted entirely online. • Administrators in the tertiary education sector face difficulty reorganizing their respective schools' schedules. Schedules, semesters, new student enrollment, and new staff hiring are inevitably affected by the MCO. • Employees in the tertiary education sector are also affected. Academic staff must become comfortable with online teaching and navigating online classrooms' technical challenges. Non-academic staff must find ways to minimize disruptions. • Untenured professors, contractual staff and international staff face greater employment uncertainty. • Academic staff must not only teach online, perhaps tweaking their lessons, managing more student questions and complaints, and marking papers but also be more responsive to students' queries. This means a more proactive approach in responding to students' emails, in addition to learning to teach online. • Meanwhile non-academic staff have to manage schedules, complaints, and ongoing queries from students, staff, and faculty. • Students are negatively affected because instructional quality is compromised: Students can no longer enjoy in-person interaction in lecture halls and tutorial rooms, and online settings increase students' difficulty of asking questions in a non-invasive way.

Managing foreign arriving and returning students from affected countries at Central Home Surveillance at Residential College

Managing foreign arriving and returning students from affected countries at Central Home Surveillance at 11th Residence College

Major preparedness/ DRR measures prior to the hazard at your university	• Establishment of the Crisis Management Committee and the Crisis Management Plan for UM. • Produce COVID-19 SOP for students arriving and returning from affected countries. • Enhance Internet and intranet facilities on campus for online teaching and learning. • Engage in constant communication with the District Health Office and State Health Department (CDC) to respond to confirmed positive COVID-19 cases and to obtain contact tracing assistance. • Create awareness among the campus community on COVID-19 prevention through portals, emails, and presentations. • Conduct Prevention and Mitigation of COVID-19 at Work Self-assessment introduced by ILO to evaluate and enhance UM's readiness.
Response efforts immediately after the hazard at your university	• Complied strictly with the MCO and SOP imposed by the National Disaster agency Malaysia, Ministry of Health, and Ministry of Higher Education • Established Task Force of Crisis COVID-19 according to prior declaration of pandemic by WHO • Provided COVID1-19 Guidance and SOP for control and prevention actions • Provided centralized home surveillance at residential college for health screening of students arriving and returning from affected countries • Immediately activated a WFH policy for all UM employees • Provide a special budget to procure PPE for all departments and colleges • Provided free meals and accommodations at centralized home surveillance facility at the Residential College. • Helped local authorities and hospitals transfer staff and students for contact tracing; provided passengers and drivers with resources and tips to protect themselves. • Adapted to the new normal culture, namely social distancing, wearing face masks, and hand hygiene across the campus and workplace.

	• Human Resources Department provided Psychological Management services to the campus community. • Provided guidance to the campus community on social distancing and wearing face masks correctly • Conducted training for the Emergency Response Team (ERT) in managing suspected positive COVID-19 cases, including patient preparation in the isolation room
Recovery efforts after the hazard at your university	• Produced Health Declaration and Check-in procedure at all points of entry • Provided additional PPE to all departments • Provided safety training for the ERT in handling COVID-19 positive cases • Revised the existing COVID-19 Control and Prevention SOP • Provided guidelines for disinfection and sanitization of workplaces • Loaned laptops to students and worked to make Wi-Fi available at extension offices across the state. • Student affairs office provided free Internet. • Practiced good hygiene measures in the workplace
Lessons learned from the event	• The Crisis Management Plan must include a deliberately explained epidemic/ pandemic action plan. • Awareness of the pandemic, especially its prevention and mitigation, should be improved to ensure total compliance among the campus community. • In-person classes across the system were moved to online delivery; therefore, information technology (IT) infrastructure must be in operation. • An Epidemic/Pandemic Coordinator or Committee must be established in each department to provide initial prevention and mitigation response. • Technical challenges specific to students who lack access to broadband Internet or to computers necessary for specific types of learning. • Employees should shift their work routines from office-based to home-based and use modern technologies such as video conferencing and virtual private network (VPN) systems.
Major changes / improvement in disaster risk management on campus before and after the event	• Establishment of COVID-19 Task Force and pandemic sub-committee (ERT) at each faculty and/or department • Enhanced epidemic/pandemic SOP in the Crisis Management Plan • Strengthened liaison and collaboration with local authorities and government agencies, namely the State Health Department, Ministry of Higher Education, Ministry of Health, Department of Safety and Health, etc.

- Crisis Management Committee needs to be vigilant and continue monitoring the new normal way of life.
- Successfully overcoming a crisis does not mean only eliminating its consequences and reducing its negative impact but also involves realizing one's mistakes, shortcomings, and deficiencies in readiness to respond and working constantly to combat these factors.

PICTORIAL COVERAGE

Arranging coordinated, supervised medical checkups outside the campus prior to course registration

Daily health screenings of quarantined students at the Residential College

Compliance with COVID-19 Control and Prevention SOPs

Compliance with COVID-19 Control and Prevention SOPs

Compliance with COVID-19 Control and Prevention SOPs

Temperature screening and check-in at point of entry

Site Disinfection Process where persons under investigation (PUI) or those with confirmed COVID-19 reside

Site Disinfection Process where persons under investigation (PUI) or those with confirmed COVID-19 reside
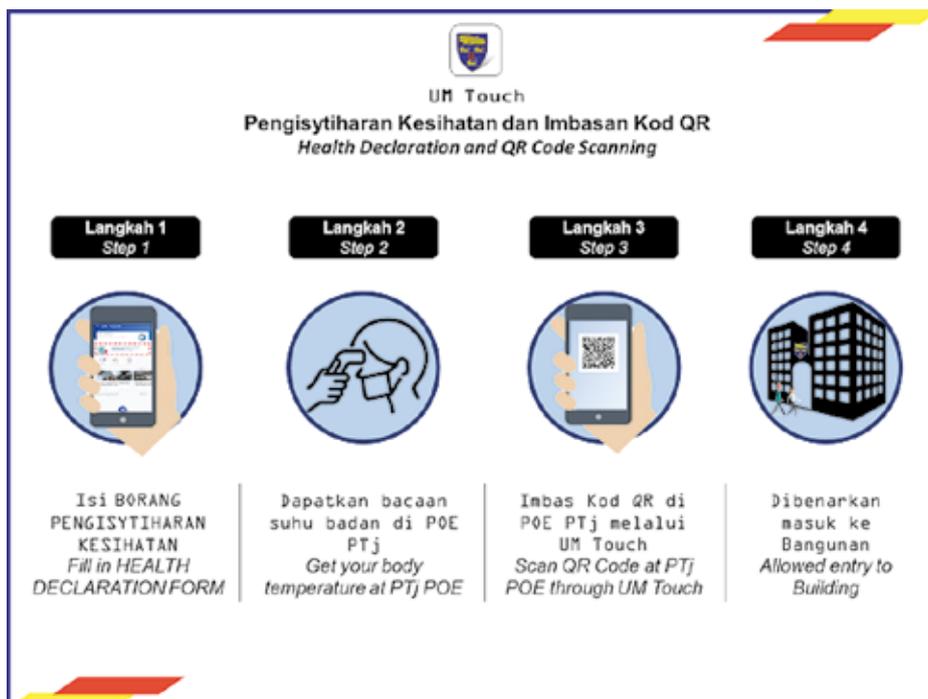
Health Declaration, temperature screening, and QR code scan before entering campus or buildings, using Mobile Applications (UM Touch)

Samples of materials published online

Major (Retired) Syed Abdul Aziz bin Syed Hashim, Universiti Malaya

MALAYSIA

University	Universiti Teknologi Malaysia (UTM)

Major damage caused by the hazard in general	• Campus closed for all students and faculty members since March 18, 2020 under the government's Movement Control Order (MCO) • Few positive cases in students and faculty members • No major disasters related to natural, fire, or chemical hazards recorded so far on campus (both Sukudai and Kuala Lumpur).
Major damage / impacts on campus (not only structural damage, but also non-structural such as termination of classes, events, etc.)	• Strict control by campus security of faculty members with permission to enter campus (staff attendance limited to under 25%, temperature checking at entrance, etc.) • All teaching and research activities limited to online engagement • Full sanitization of campus buildings • Possibility of affecting students' graduation due to delays in academic activities • Students unable to return home due to MCO (inter-state travel forbidden)
Major preparedness/ DRR measures prior to the hazard at your university	• Management of student housing (including distribution of food and other essential items) to prevent cluster breakouts • Emergency Response Team (ERT) and manual for fire emergencies, but no internal experts on pandemics and chemical disasters • Coordination with Police, Fire Department, and Ministry of Health pre-determined in ERT manual (available only in Bahasa Melayu) • Database Monitoring System for COVID-19 at UTM suggested and being developed by Task Force members • To determine levels of disaster risk for each department and building, on-campus Disaster Risk Map being developed • Annual fire evacuation drill conducted by each department
Response efforts immediately after the hazard at your university	• COVID-19 Task Force established based on SOP by Ministry of Health • Teaching and learning switched to online per government SOP • Limitation of faculty members' attendance at work (less than 25%) • COVID-19 Task Force established based on Ministry of Health SOP • Government app "MySejahtera" used effectively to monitor status of faculty members and students
Recovery efforts after the hazard at your university	• Because the Conditional Movement Control Order (CMCO) will be in effect until November 9, 2020, no response plan is being discussed.
Lessons learned from the event	• COVID-19 was the first major disaster experience for UTM; therefore, the university is now highly conscious of pandemics but also other types of disaster risks. • Risk analysis and ranking of risks by the university might encourage investment in reducing those risks, whether structural or non-structural.

	• UTM may become proactive in managing future disasters, instead of waiting for government instructions. • Each department's risk data and information have not been properly shared; therefore, a database system should be developed.
Major changes / improvement in disaster risk management on campus before and after the event	

Dr. Sumiaty Ambran, Malaysia-Japan International Institute of Technology (MJIIT),
Universiti Teknologi Malaysia (UTM)
Nor Zairah Ab. Rahim, Associate Professor, MJIIT, UTM
Dalila Mat Said, Associate Professor, MJIIT, UTM
Dr. Muhammad Hanif Bin Ramlee, Faculty of Engineering, MJIIIT, UTM
Dr. Zanariah Hashim, Faculty of Engineering, MJIIT, UTM
Dr. Zulhairun Abdul Karim, Faculty of Engineering, MJIIT, UTM
Dr. Siti Hajar Binti Misnan, Faculty of Built Environment, MJIIT, UTM
Shohei Matsuura, Associate Professor, MJIIT, UTM

MALAYSIA

NEPAL

University	Tribhuvan University

Major damage caused by the hazard in general	The effect of COVID-19 was severe in Nepal. Tribhuvan University (TU), one of the oldest and largest in Nepal, with campuses in nearly all regions, was also affected. Some TU officials contracted the virus, and a variety of academic and administrative departments on various campuses closed completely for more than 3 months.
Major damage / impacts on campus (not only structural damage, but also non-structural such as termination of classes, events, etc.)	• All teaching-learning activities, including ongoing examinations were halted. • Many planned field visits, academic tours, and conferences were postponed. • Many students were also affected, and at least one academic session was directly disturbed. • The university's building construction was affected due to cancellation of the procurement process.
Major preparedness/ DRR measures prior to the hazard at your university	• The university closed all its activities immediately after the Government of Nepal (GoN) declared a nationwide lockdown on March 24, 2020. • The university was prepared to deal with unforeseen conditions that might arise due to the pandemic after its rapid spread in China and beyond. • University staff and students were advised to use masks and sanitizer; awareness raising programs were conducted on the campuses. • The university issued a notice to follow all relevant rules and procedures suggested by the GoN. • The university prepared and encouraged its faculties, students, and staff to familiarize themselves with online platforms for regular meetings and teaching activities.
Response efforts immediately after the hazard at your university	• The university followed all the GoN's declarations and rules, publishing information about its closing until further notice for all concerned stakeholders. • All academic and administrative staff and students supported the university's preventive steps. Additionally, the university requested all campus administrations to disinfect administrative buildings and classrooms regularly. • In all regions of Nepal, most campuses were utilized as quarantine centers. Tribhuvan University Teaching Hospital (TUTH) designated one unit as a fever clinic and isolation ward for corona treatment. During the pandemic, TUTH operated 24/7 for all kinds of treatments.
Recovery efforts after the hazard at your university	• Different campuses began online classes using virtual platforms, i.e., Microsoft Team, Zoom, Google Meet, etc. The university also trained academic and administrative staff on use of Microsoft Team for regular virtual meetings and classes.

	• Some campuses conducted research-oriented work, i.e., mid-term and final viva-voce of MSc and PhD theses during the lockdown period. • Tribhuvan University formed a committee to recommend alternative examination systems for use during the COVID-19 pandemic. • As per recommendation, Tribhuvan University published a notice of on-site examinations to be conducted following preventive measures. In the meantime, tentative academic plans are being discussed among concerned authorities and bodies.
Lessons learned from the event	• Important lessons were learned about proper understanding of the disaster risk management cycle. • This pandemic has taught us about important aspects of the interaction of science, society, and nature with humankind. Everyone should live in harmony with nature and also maintain harmony among the ecosystem's various actors. • University officials realize that preparedness and mitigation of potential risk are always more important than rescue and recovery; preparation of contingency plans for possible hazards is important to build community resilience. • In addition, the pandemic has provided strong lessons about strengthening public health policies and systems, building capacity in human healthcare resources, and investing in health infrastructure. • Furthermore, university officials have realized that the university should initiate alternative teaching-learning activities using available information technology.
Major changes / improvement in disaster risk management on campus before and after the event	• This pandemic spurred behavior change on sustainable use of natural resources and practice of hygiene and sanitation measures. • We have begun practicing new activities in our daily routines, i.e., physical distancing, use of masks, and frequent handwashing and use of sanitizer. • Social awareness and training are regarded and practiced as highly important in planning and implementation of disaster risk reduction projects. • The university requires use of face masks and sanitizers at work stations. • After the pandemic began, most campuses established in-house cafeterias to avoid infection. • University premises are disinfected regularly, and the university as a whole is motivated to use virtual tools for academic work and meetings.

Gyan Bahadur Thapa, Professor, Tribhuvan University
Dr. Basanta Raj Adhikari, Tribhuvan University

University	University of Peshawar

Major damage caused by the hazard in general	• Pandemic • Loss of lives across Pakistan • Lockdown
Major damage / impacts on campus (not only structural damage, but also non-structural such as termination of classes, events, etc.)	• Long-term lockdown due to COVID-19 has affected studies, examinations, seminars, research, and co-curricular activities on campus. • Traumatic stress • Termination of classes; events and mass gatherings prohibited on campus • Evacuation of students from all on-campus hostels on an emergency basis
Major preparedness/ DRR measures prior to the hazard at your university	• To cope with COVID-19 and prevent the spread of the virus, a complete lockdown was implemented on campus. • Gatherings of more than 2 persons were banned. • Hostels were vacated. • Wearing masks is still mandatory; no one is allowed on campus without a mask. • Online classes, examinations, and assignments
Response efforts immediately after the hazard at your university	• Rescue 1122 team is available 24/7 on campus to swab suspected patients and send samples to the central lab for PCR • To keep the system going, staff and other meetings of university administration are held online. • Ban on gatherings, seminars, and ceremonies • Awareness campaigns
Recovery efforts after the hazard at your university	The university is still closed due to the Covid-19 threat. However, the university has begun online classes and examinations to recover from the disruption. To keep the system going, staff and other meetings of university administration are also held online.
Lessons learned from the event	• Online classes, examinations, and assignments are alternate mechanisms of regular classes • A trained medical emergency response team for such diseases • More informed decision making
Major changes / improvement in disaster risk management on campus before and after the event	• Establishment of an LMS system for registering students and online courses • Training designated persons in each department to facilitate the faculty's online teaching • Emergency response plan with COVID-19 protocol • Availability of medical team for sampling • Online classes and examinations

Dr. Atta-ur-Rahman, University of Peshawar
Imran Khan, University of Peshawar

PAKISTAN

PHILIPPINES

University	University of the Philippines Diliman(UPD)

Major damage caused by the hazard in general	As of 18 November 2020, there are 445 confirmed cases for UP Diliman, with 409 recoveries and 8 deaths. This includes faculty, staff, students and residents within the University's compound. In the Philippines, as of 23 November 2020, the Department of Health reported that there are 420,786 total cases, whereas 24,209 are Active Cases, 386,486 have recovered and 8,123 have died.
Major damage / impacts on campus (not only structural damage, but also non-structural such as termination of classes, events, etc.)	The major damages/impacts that COVID-19 brought to the UP Diliman campus: • Some of the members of the community were infected by the virus (students, faculty, staff and residents within the campus); • Some offices were closed while other offices allowed a skeleton force to report for work; suspension and delay in the provision of some services; • Termination of face-to-face classes and other campus events (some campus events, e.g. Commencement Exercises, were physically terminated but were done virtually/through online platforms). • New work arrangements were also instituted by the University, such as work from home arrangements and decreased number of days to physically report for work, among others.

Major preparedness/ DRR measures prior to the hazard at your university	1. Influenza vaccine for University personnel
	The UP Health Service (UPHS) offers vaccines to its constituents, including the annual flu vaccine. While this is not free of charge prior to the hazard, the vaccine is available through the UPHS-Public Health Unit (UPHS-PHU).
	
	2. Appointment of Health Liaison Officers (HeLO)
	The UPHS-PHU, in coordination with the Office of the Vice Chancellor for Community Affairs (OVCCA), requested that all offices and units within the University appoint their own HeLOs. The HeLOs' functions are as follows:
	  a. Communicates with UPHS-PHU on a regular basis regarding their office's/unit's health situation;
	  b. Helps in the dissemination of relevant health information through the distribution of posters or flyers, maintenance of a health bulletin boards, organize health forums, etc.; and
	  c. Participation in the actual implementation of public health or infection control measures.

Response efforts immediately after the hazard at your university	1. Creation of the UP Diliman COVID-19 Task Force in March 2020 The Task Force oversees studying the current situation within the campus vis-a-vis the local government and the national government and implementing necessary policies, protocols and mechanisms that will prepare and protect the community from the pandemic.

Silungang Molave (SiM)

SiM Hallway: A view of the patients' rooms

Waste bins: properly labeled for waste segregation

2. Release of the University's Post-ECQ Guidelines
After the community quarantine level was lifted and changed into General Community Quarantine (GCQ) from Enhanced Community Quarantine (ECQ), the University released the UP Diliman Post-ECQ Guidelines on 13 May 2020 through Administrative Order No. FRN-20-052. The guidelines contained policies and measures for those who will be physically reporting for work, office operations, cleaning houses/offices, and ensuring the health and safety of the skeleton staff.

An Updated UP Diliman Post-ECQ Guidelines was released on 11 November 2020, through Administrative Order No. FRN-20-068, to reflect the easing of restrictions implemented by the national and local government. The guidelines were formed in anticipation as the University gradually opens its campus in the coming months.

3. Opening of *Kanlungang Palma (KP)*
The University opened KP, its first community isolation facility, after it passed the Department of Health's (DOH) second inspection on May 13, 2020. The isolation facility, with a capacity of 26 beds, was home to those who are suspect and probable COVID-19 patients with mild symptoms and those who were waiting for the results of the swab tests but unable to quarantine at home. While priority was given to members of the UP Diliman community, especially those who are living within the campus, it was also open to those from nearby barangays who can no longer be accommodated at the isolation facilities sponsored by the barangay and the Quezon City local government. KP ceased operations in July 2020 in anticipation of the opening of classes in August 2020 (This isolation facility is an academic building; it houses the College of Social Sciences and Philosophy). Subsequently, Silungang Molave (SiM), a second community isolation facility was opened on 15 August 2020.

PHILIPPINES

4. Opening of Silungang Molave (SiM)

SiM is the University's second community isolation facility. A former student dormitory/ residence hall, Molave Residence Hall was turned into SiM as part of the University's response to the COVID-19 pandemic. In addition to housing patients who were tested and diagnosed to have moderate or mild COVID-19, SiM also serves as isolation facility for those who are waiting for their swab test results and are unable to isolate themselves at home.

On 23 October 2020, the DOH certified SiM as a Temporary Treatment and Monitoring Facility for COVID-19 patients with mild symptoms. The isolation facility cannot accept children or those with comorbidities as patients.

5. Conduct of Targeted-Testing among physically-reporting personnel

The University sponsors the swab testing of its personnel: Very High Risk personnel are tested every month; High Risk personnel are tested once every two months; and Medium Risk personnel are tested if they are considered as close contacts of COVID-19 positive patients and upon the recommendation of the UP Health Service-Public Health Unit.

6. Establishment and hiring of a Contact Tracing Team

Part of the University's response to the COVID-19 pandemic is the hiring of contact tracers who help the UPHS-PHU in identifying the close contacts of those who tested positive for COVID-19.

7. Community Engagement and Public Information Project

In addition to the Community Isolation Facility, Targeted Testing, and Contact Tracing, the University also launches its Community Engagement and Public Information Project. There are two groups of volunteers who go out in the community two or three times a week for information dissemination and consultation with the different pook leaders, among others.

8. Conduct of Risk Assessment Evaluations and Surveys for all offices and units All offices and units within the University were requested to conduct risk assessment evaluation and surveys which were used as basis for the list of personnel whose names were included in the University's targeted testing.

9. Launch of online Health Screening Checklist for University personnel and visitors To lessen the probability of infection, the University launched its online Health Screening Checklist for University personnel. If the personnel/visitor is unable to complete the online health screening checklist, paper forms and pens are provided at the entrance of the office/building.

10. Dissemination of infographics and publicity materials

Infographics and publicity materials were disseminated through posters, tarpaulins and flyers all over the campus as well as through

social media. Information is regarding the novel coronavirus, how it is spread, how infection can be prevented and who they can contact in case of emergency.

11. Organizing and appointment of the University's Post-ECQ Teams (PETs) (online meetings were held to discuss the University's situation during pandemic, what we can do to prevent the spread of the virus and how to ensure the health and safety of the University's personnel.

12. Manual procedures were converted to online/digital processes to promote less personal/ face-to-face transactions.

13. Physical/face to face mode of learning shifted to remote/online learning for academic classes. Teachers were also trained to prepare and enable them for remote learning.

14. Due to the pandemic, the academic calendar, which previously ran from August to July, was adjusted. For Academic Year 2020-2021, the first semester is scheduled from September 2020 until January 2021.

15. Teachers were also required to prepare course packs for the classes to be given to their students before the classes start. The course packs are a compilation of the course's readings and other materials needed by the students. It aims to promote independent learning among the students, to be reinforced by the online/dialogue learning.

16. Whenever there are requests to open certain facilities within campus, the Public Health Unit of the UP Health Service assigns a team to inspect the premises for its compliance to minimum health protocols. They would also recommend other necessary interventions that have to be instituted before the facility may be opened to the public, e.g. interventions for improved ventilation.

17. Dormitory facilities were redesigned to make these compliant to minimum health protocols in the time of the pandemic

| Recovery efforts after the hazard at your university | 1. Release of the Updated Post-ECQ Guidelines (The guidelines were modified to accommodate the national and local government's plan to slowly open the economy by easing up on the restrictions, and in preparation for the increasing the number of physically-reporting personnel per office, etc.)
2. Proposal to continue the operations of SiM, which was originally approved and with funding until the end of December 2020. |
| Lessons learned from the event | 1. The University needs the following:
Regular risk assessment/evaluation especially since the pandemic is still ongoing |

	2. Offices/Units need to upgrade/improve their physical work environments to ensure that there is enough airflow/ventilation for all physically-reporting personnel
	3. All offices/units should comply and appoint their respective Post-ECQ Teams and Health Liaison Officer
	4. Establish Disaster Risk Reduction and Management measures not only for earthquakes but also for other potential hazards: biological, chemical and technical.
Major changes / improvement in disaster risk management on campus before and after the event	1. Intensified information dissemination to the University's stakeholders
	2. Mobilization of University personnel who are assigned to ensure the health and safety of the personnel in their respective offices/units
	3. Online meetings between the University's administration and personnel were conducted to inquire about each other's welfare and current being
	4. Establishment of COVID-19 Task Force and Special Committees who discuss and draft guidelines that are to be implemented and complied with
	5. Meetings are held weekly to discuss the COVID-19 situation in the University

Patient's room: 1 patient per room, with bed, table and chair and cabinet (not in photo)

Donning and doffing area with health care workers

Fidel R. Nemenzo, DSc., Chancellor, University of the Philippines Diliman (UPD)
Alfredo Mahar Francisco A. Lagmay, Professor, University of the Philippines Diliman (UPD)

SINGAPORE

University	National University of Singapore

Major damage caused by the hazard in general	1. Ill-health of staff and students 2. Disruption to academic and research activities and projects 3. Disruption to administrative and construction projects
Major damage / impacts on campus (not only structural damage, but also non-structural such as termination of classes, events, etc.)	1. Classes were moved from face-to-face to online. 2. Outreach activities such as Open Day and the Career Fair were moved online 3. Cancellation and/or suspension of overseas travel for conferences, internships, and attachments 4. Cancellation and/or suspension of local internships
Major preparedness/ DRR measures prior to the hazard at your university	1. Establishment of business continuity framework (BCP) for the university 2. All departments required to establish business continuity plans and to conduct regular BCP exercises and drills 3. Establishment of crisis/emergency framework, to deal with incidents of varying severity 4. Staff and students issued with thermometers and lanyards (for identification). 5. Purchase of thermal scanners (for temperature taking) 6. Establishment of contract tracing team
Response efforts immediately after the hazard at your university	1. Activation of Crisis Emergency Group (CEG) and Crisis Emergency Management Team (CEM) to coordinate crisis and emergency response efforts 2. Travel Restrictions to China and other countries of concern for all staff and students 3. Mandatory travel declaration 4. Dedicated website and regular circulars to all staff and students (https://emergency.nus.edu.sg/) 5. Regular dialogue with all regulators and national authorities– Ministry of Education, Ministry of Manpower, and Health Promotion Board 6. Ad-hoc approval for return to campus 7. Swab testing for contractors and vendors 8. COVID-19 related research to contribute national agenda on research and innovation 9. NUS App for temperature taking
Recovery efforts after the hazard at your university	1. Town Hall meetings conducted by President with each staff category 2. Safe Management Officers to monitor compliance 3. Return-to-Work safety video 4. Posters to communicate on Safe Management Measures 5. Increased cleaning and certification to national standards (SG clean) 6. Mandatory mask wearing 7. Cashless payment and/or transactions at F&B outlets 8. Antimicrobial coating for lift buttons on campus

Safe Distancing Markers & Signages

	9. Launch of NUS app for zoning. 10. Allocation of staff and students to zones 11. Safe distancing markers and signage
Lessons learned from the event	1. A pandemic can affect all aspects of university operations and disrupt supply chains. 2. The university needs to launch digital solutions speedily to keep pace with new control measures.
Major changes / improvements in disaster risk management on campus before and after the event	1. Changes to design standards for construction of new workspaces (towards touchless surfaces) 2. More tabletop exercises for various types of crisis situations 3. Review of the university risk register

Appendix: Recovery and Response Measures

Safe distancing labels in elevator lobbies

Safe distancing labels in lecture halls

Antimicrobial Coatings in Elevators
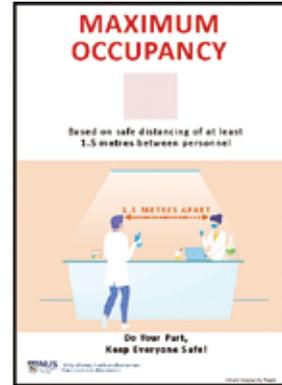
Posters on Safe Distancing and Maximum Occupancy

PPE TRAINING & MASK FIT TESTING

7 Sessions
14 May 2020 – 2 June 2020
330 Trainees

Trainees in PPE

N95 mask fit testing

PPE briefing conducted in 3 languages

Hands-on training on PPE

Trainers with trainees in PPE
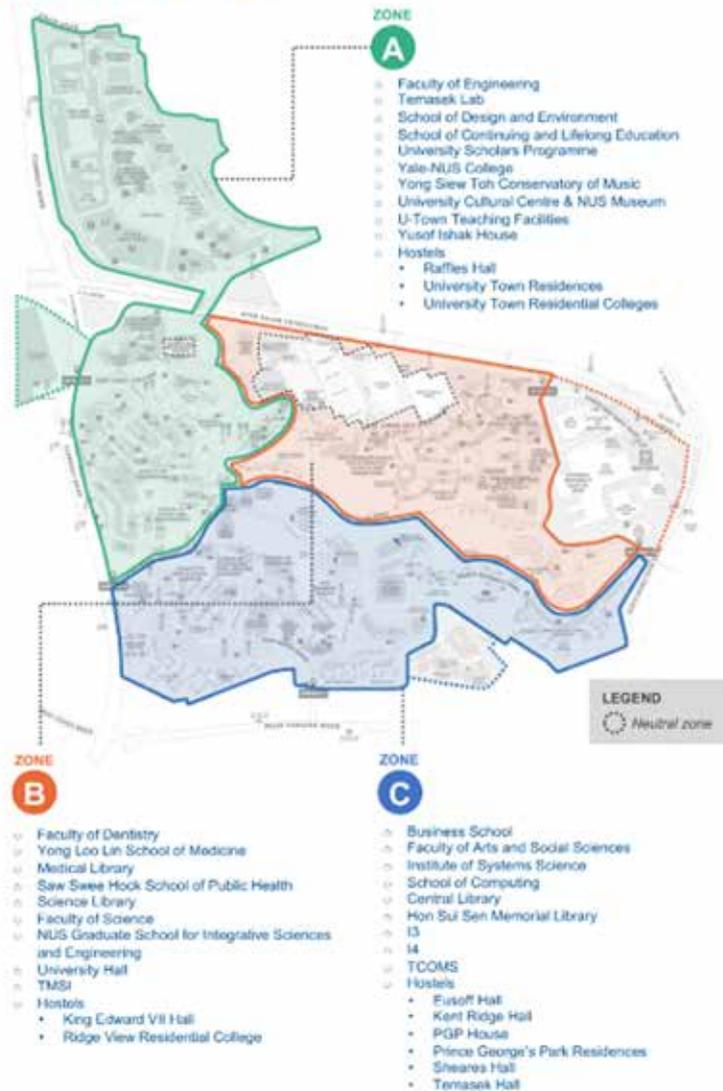
The campus is divided into five zones.

Dr. Thian-Guan PECK, National University of Singapore

SRI LANKA

University	Faculty of Science, University of Colombo

Major damage caused by the hazard in general	• The present case study focuses on the COVID19 pandemic, which has been a major health issue in many countries around the world in 2020. The speed and scale of transmission and severity of damage are issues of concern. • The infection causes mainly breathlessness, fatigue, and respiratory failure; death is also possible. The pandemic has had many impacts including those on health (hospitalization, psychological fear, death), the economy (disturbances to normal life, closures of institutes and industries, loss of income, impacts on economic growth), and society (restrictions on daily and social lives, etc.). • At this writing, no faculty members have contracted the virus, but a few have had secondary contacts.
Major damage / impacts on campus (not only structural damage, but also non-structural such as termination of classes, events, etc.)	Only non-structural damages experienced. *Administrative*: near total closure of the entire university for more than 1 month as a precaution, work on rotations for non-academic staff when restarting *Academic*: shifting of teaching to 100% online mode in April; inequality issues among students as some face IT, Internet, and computer problems; cancellation of laboratory and field-based classes as well as examinations from March–August; limitations on employing temporary academic staff *Other*: Cancellation of all social events and on-campus student activities; disturbances to research and outreach activities; disturbances to some activities due to practice of social distancing; transportation and accommodation issues among students; fear psychology
Major preparedness/ DRR measures prior to the hazard at your university	The current situation was not expected, and the faculty was not prepared for the impact of a pandemic on this scale.
Response efforts immediately after the hazard at your university	*Administrative*: Temporary closure of the faculty; liaison with university and government authorities about future activities and safety precautions when reopening only to staff *Academic*: Transforming all teaching to distance learning mode; postponement of examinations, convocations, etc. *Other*: Banning students' physical entrance; enhancement of safety facilities (temperature checking, hand washing, social distancing) for staff; restriction of entry; and other activities
Recovery efforts after the hazard at your university	*Academic*: Strengthening online teaching and learning through introduction of new IT facilities; staff training for delivering online lectures; introduction of new teaching and evaluation methods, new timetables, and new bylaws for examinations *Other*: Safety—new safety regulations and facilities; welfare–financial aids, laptop computers supplied to needy students; research on

Wearing a mask and handwashing as safety precautions

Social distancing at lectures

	COVID-19 and related issues, new COVID19 testing facility to help health authorities
Lessons learned from the event	Importance of: a. Preparedness and planning ahead to face any disaster b. Integrated emergency response plans at universities c. Raising awareness of emergency responses d. Initiation of new research related to the COVID19 pandemic (testing, modelling, software applications, etc.)
Major changes / improvement in disaster risk management on campus before and after the event	*Administrative*: More attention paid to health, sanitation, and other practices related to reducing risk of spreading disease; development of emergency management plan *Other*: Initiation of a new help scheme for affected students suffering from financial difficulties

Deepthi Wickramasinghe, Professor, Department of Zoology, University of Colombo
Chamari Hettiarachchi, Professor, Department of Chemistry, University of Colombo

SRI LANKA

TAIWAN

University	National Taiwan University

Major damage caused by the hazard in general	• Announcement No. 1090100030 of the Ministry of Health and Welfare of the Republic of China on January 15, 109, added "severe special infectious pneumonia" as the fifth category of legal infectious diseases. • Since December 2019, Wuhan City, Hubei Province has launched monitoring of respiratory and related diseases, and cases of viral pneumonia of unknown cause have been found. • On January 9, 2020, we received a notice from Mainland China that the pathogen was initially determined to be a new type of coronavirus. • In addition to seven coronaviruses known to infect humans, other animal hosts include bats, pigs, cattle, turkeys, cats, dogs, and ferrets. And there are sporadic reports of cross-species transmission.
Major damage / impacts on campus (not only structural damage, but also non-structural such as termination of classes, events, etc.)	(1) The University postponed the 2020 spring semester's start date to March 2, two weeks from the original date. The schedule for registration and course enrollment was also postponed for two weeks. (2) As of May 21, 109, 989 faculty and staff members of National Taiwan University reported that they had travelled/transited around the world or had been tested for the new crown pneumonia virus. Among them, 120 faculty and 117 staff have completed isolation, quarantine, or independent health management and closed their cases after 14 days; students accounted for 869 cases, and 867 have completed tracking management and closed their cases after 14 days.
Major preparedness/ DRR measures prior to the hazard at your university	(1) The University built an NTU Website for Disease Control (https://my.ntu.edu.tw/ntuwdc/) to enhance the epidemic's investigation, and to announce standard operating procedures (SOP) for disease control. (2) The University will, in principle, adopt a flexible and lenient approach to course enrollment, registration, leaves of absence, suspension/ termination, and so on, with a view to alleviating possible impact resulting from escalation of the disease in our students. (3) The timetable of courses in the 2020 spring semester will be adjusted because of the start date's postponement. The semester's end date, originally scheduled for June 20, has been rescheduled to July 3. We advised our teachers to modify course plans so as to finish courses in 16 weeks so that our students can carry out, as scheduled, their summer plans for summer programs, certificate examinations, internships, and overseas exchanges. The 17th and 18th weeks will be reserved for mediation/enrichment courses since spring courses can be accomplished in 16 weeks via online teaching,

Fig. 1 No visitors during the epidemic prevention period, and everyone must show an ID.

Fig. 2 National Taiwan University has developed a low-cost "non-contact forehead thermometer."

examinations, independent learning, and projects, etc. End-of-semester examinations will be held during the 16th week.

(4) For students from China who are unable to travel to the University, support for distance teaching and learning will definitely be provided. We encourage eligible graduate students to enroll in courses such as dissertation, special topic, oral examination, and others that can be delivered via online discussion. We urge supervisors to facilitate their graduate students' course enrollment in the aforementioned cases to meet requirements for conferment of a degree.

(5) Cleaning and sanitizing measures have been reinforced in all teaching and learning buildings and will continue in frequency and improved methods after the semester's commencement.

Response efforts immediately after the hazard at your university	(1) Reduce the campus's open space and entry of non-school personnel.
	(2) Regarding NTU's guidelines on building access control and temperature checks, visitors are, in principle, required only to swipe their ID cards and have their temperatures taken at first entrance, after which only card swiping is compulsory for (re-)entrance.
	(3) Suspension of gatherings or assemblies of 100 people or more until May 31.
	(4) Suspension of international travel among students and colleagues until May 31.
	(5) Suspension of nonessential physical meetings until May 31.
	(6) Temporary closures of the Sports Center, Gymnasium, and outdoor Swimming Pool to May 31.
	(7) Beginning April 27, all courses with 60 students or more should shift to distance learning.

Recovery efforts after the hazard at your university	We are still fighting the disease; the campus has been opened to the public, but building access control is ongoing.
Lessons learned from the event	Since the outbreak of the new crown pneumonia epidemic in Taiwan, **maintaining the university's normal operation during the epidemic prevention process has become an important and difficult issue**. In this epidemic, Taiwan's universities have faced severe impacts and challenges: home isolation in dormitories for more than a hundred overseas Chinese; diagnosis and prevention of the virus; and learning remote teaching skills. In the face of these arduous tasks, we do not dare to relax but, with humility, must keep learning and improving.

(1) Participate in epidemic prevention in unity
- To integrate the whole school's relevant resources for epidemic prevention work, National Taiwan University established a new crown pneumonia epidemic prevention team.
- The president holds weekly epidemic prevention team meetings to discuss comprehensive response measures for the new crown pneumonia epidemic prevention and control work, develop SOP, and actively implement epidemic prevention work.
- The epidemic prevention team is headed by the Academic Affairs Office for health and public health protection, with deployment of epidemic prevention materials and campus disinfection by the General Affairs Office, remote teaching by the Academic Affairs Office, the International Office to remain in contact with overseas Chinese and foreign students, and the environmental security center in charge of access control measures, etc.
- Relevant offices cooperate, and the student union includes members of the epidemic prevention team to strengthen reflection and communication of student opinions.
- In addition to the school-level epidemic prevention team, deans of each college also convene directors of various departments to establish a hospital-level epidemic prevention team to discuss and implement hospital-level epidemic prevention work and to assist in the preparation and promotion of remote teaching.
- To strengthen communication of epidemic prevention work among units, all school units need to send staff to participate in the "epidemic prevention group." Representative units explain or reply to related matters in the group. Through the group, relevant epidemic prevention measures can be immediately promoted to school staff. In addition, colleagues in all units must take turns at entrances and exits of campuses or venues to assist in access control and body temperature measurement. By participating together in epidemic prevention work, they also gather their colleagues' centripetal force. Everyone is an important member in solid epidemic prevention work.

(2) Smooth communication channels
- At the beginning of the epidemic, the school set up a NTU Website for Disease Control (https://my.ntu.edu.tw/ntuwdc/) on the school homepage so that the public and school staff and students can

understand the school's actions.
- In addition to presenting the school's latest information, it also discloses important government information related to epidemic prevention. Too, messages are delivered quickly through emails and related discussion groups. Relevant information is presented in both Chinese and English in consideration of foreign teachers and students.

(3) Anti-epidemic with science and technology, assist in access control, and independent health management
- In this epidemic prevention work, the real-name system developed by the school's computer center can not only help students record and monitor daily body temperature but also serve as access control by identifying them.
- This system can be used on various campuses to include classrooms, laboratories, departmental offices, administrative offices, etc. It scans the QR code for signing in and records footprints; at the same time, it serves as teachers' name or epidemic report.
- In addition, combined with the infrared body temperature measuring instrument developed by the school's electrical engineering department, it can also achieve simultaneous functions of autonomous body temperature monitoring and access control identification.

(4) The entire school implements distance teaching
- Our school was actively preparing for distance teaching at the beginning of the epidemic, and in March, when Mainland, Hong Kong, and Macao students were unable to enter the country, it quickly promoted flexible distance teaching programs. Many teachers have experience in distance instruction, but quite a few are still hurrying to take this path.
- During implementation of distance teaching, the Teaching Development Center of the Academic Affairs Office will provide support for curriculum coordination, distance teaching, and digital learning design.
- In addition, it will also provide teachers and assistants the use of digital media and technology, curriculum interaction for implementation of distance courses, web page building, and other training and consulting services.

Response efforts immediately after the hazard at your university	• In the last semester, most courses were changed to distance teaching, and teacher-student interaction and teaching methods continued to evolve, forcing everyone to think about the future of education. • During the epidemic, human beings appear insignificant and humble. We cannot keep the virus thousands of miles away. We can only be more cautious in facing a life changed by the virus.

國立臺灣大學嚴重特殊傳染性肺炎防疫通報作業流程圖

109.03.23

說明：(1) 臺大校園傳染病管制網：https://my.ntu.edu.tw/ntuwdc/default.aspx
(2) 各單位內如出現通報個案、疑似個案或確診個案，請立即通報保健中心。
(3) 本流程之教職員工生亦包含各單位自聘人員、博士後研究員、研究助理、工讀生、短期計畫人員、臨時工、駐校廠商、與洽公訪客。

(1) 各單位防疫聯絡人應要求所屬教職員工生全部填寫「國立臺灣大學校園嚴重特殊傳染性肺炎健康關懷問卷」(可於「臺大校園傳染病管制網」下載)，並將問卷收回備查。
(2) 3月13日前，自一、二級流行地區與一、二、三級旅遊疫情建議地區入境返台(含於上述地區轉機)之教職員工生，以及3月14日起，自全球任何地區入境返台之教職員工生，防疫聯絡人應對其做後續追蹤，並要求其登入「臺大校園傳染病管制網」通報保健中心(無本校帳號者，可由他人代為登入通報)。
(3) 3月14日起，全球任何地區返台之教職員工生亦請主動通知所屬系所/單位之防疫聯絡人(住宿學生除通知防疫聯絡人外，也須通知宿舍輔導員)，並將所填寫之健康關懷問卷交由防疫聯絡人做後續追蹤。
(4) 非全球任何地區入境返台教職員工生所填寫之健康關懷問卷由防疫聯絡人存查，無須交回保健中心。

(1) 各單位防疫聯絡人請每天電話追蹤自上述地區返台教職員工生之健康狀況，要求其於14天內測量體溫並回報。
(2) 所有教職員工生若具中港澳旅遊/接觸/轉機史，應做居家檢疫。申請獲准至港澳入境者，應做自主健康管理。
(3) 2月6日(含)後，中國大陸各省市陸人暫緩入境。2月11日起，港澳人士暫緩入境。
(4) 2月24日起，自泰國、義大利、伊朗、新加坡、日本入境者，需進行自主健康管理。
(5) 2月25日起，自韓國入境的外國籍人士需進行居家檢疫。
(6) 2月25-26日，自韓國入境的本國籍人士，需進行自主健康管理。
(7) 2月27日起，自韓國入境的本國籍人士需進行居家檢疫。
(8) 2月28日起，自義大利入境的所有人士需進行居家檢疫。
(9) 3月02日起，自伊朗入境的所有人士需進行居家檢疫。
(10) 3月07日起，自法國、德國、西班牙入境的所有人士需進行自主健康管理。
(11) 3月11日起，自希臘、捷克、葡萄牙、芬蘭 、斯洛維尼亞、波蘭、愛沙尼亞、匈牙利、盧森堡、馬爾他、斯洛伐克、拉脫維亞、立陶宛、列支敦斯登、英國、愛爾蘭，以及冰島、瑞士、挪威、瑞典、比利時、荷蘭、丹麥、奧地利、巴林、科威特入境的所有人士需進行自主健康管理。
(12) 3月14日起，自全球任何國家入境，至少需進行自主健康管理。其他需居家檢疫者如上所示。
(13) 3月17日起，自歐洲申根國家、英國、愛爾蘭共28國、杜拜(杜拜含轉機)、東歐13國、中東15國與1地區、北非5國及中亞9國入境的所有人士需進行居家檢疫(註)。
(14) 3月18日起，回溯3月5日至14日自歐洲、埃及、土耳其與杜拜入境民眾(暫含轉機)需進行居家檢疫。
(15) 3月19日起，所有外籍人士禁止入境(除事前申請核准者外)。所有入境者均需進行居家檢疫。
(16) 3月21日起，回溯3月8日至18日自美國及東亞入境且有出現症狀的所有人士應進行居家檢疫。

14天內皆無症狀

追蹤14天後，防疫聯絡人將「國立臺灣大學校園嚴重特殊傳染性肺炎健康關懷問卷」以E-mail: hungch@ntu.edu.tw送回保健中心存查。

沒症狀的由防疫聯絡人追蹤，有症狀的交由保健中心追蹤。

註：有關個別國家的詳細名稱，請以衛生福利部疾病管制署公告為準。

14天內出現發燒或類流感症狀

⭐ 居家隔離、居家檢疫、及自主健康管理中的教職員工生請主動聯絡1922防疫專線，聽從1922專線指示就醫，切勿自行就醫。

居家隔離、居家檢疫、及自主健康管理中出現症狀之教職員工生，亦請主動將自身狀況通知所屬系所/單位之防疫聯絡人(住宿學生除通知防疫聯絡人外，也必須通知宿舍輔導員)，由防疫聯絡人和宿舍輔導員以E-mail: hungch@ntu.edu.tw或電話3366-2165通報保健中心，後續追蹤交由保健中心執行。

防疫聯絡人將「國立臺灣大學校園嚴重特殊傳染性肺炎健康關懷問卷」以E-mail: hungch@ntu.edu.tw送回保健中心存查。

Fig. 3 National Taiwan University COVID-19 Prevention Operation Flow Chart.

Dr. Tsung-Yi Pan, National Taiwan University
Hung-Chi Kuo, Professor, National Taiwan University
Chung-Hsi Chou, Professor, National Taiwan University

TAIWAN

University	Chulalongkorn University

Major damage caused by the hazard in general	- Some university functions were shut down—lecture classes, laboratories, projects, etc. due to the COVID-19 situation. - Faculty members and students of Chulalongkorn University feared the impact of the COVID-19 situation. - Based on the 4th report from Chulalongkorn University on April 8, 2020, the university had 4 cases of COVID-19.
Major damage / impacts on campus (not only structural damage, but also non-structural such as termination of classes, events, etc.)	- Lecture classes had to change from on-site classrooms to online classrooms; this caused many issues due to the adaptations. - Events such as board meetings, conference meetings, exhibitions, and some clubs' and student group meetings were cancelled. - All cafeterias on campus were closed.
Major preparedness/ DRR measures prior to the hazard at your university	- For the last few years, the campus has been preparing for online classes by purchasing licenses for applications such as Google Meet, Microsoft Teams, etc. along with Chula Engineering's development of the learning management system MyCourseVilles. - The campus had been preparing for multi-hazard situations by establishing a risk management center within the university.
Response efforts immediately after the hazard at your university	- Chulalongkorn University announced measures for addressing the COVID-19 situation since February 26, 2020, especially by bringing the attention of the engineering faculty members and students to it. - The university also announced security measures for the beginning of the first 2020 semester: 1. Most lecture classes are conducted online, except for some mandatory meetings between students and lecturers. 2. Along with the university's overall security measures, special measures are taken to prepare laboratories for the COVID-19 situation so that classes may be held. - The university quickly responded as the situation worsened, to ensure that every faculty member and student would be safe by shutting down some functions vulnerable to the COVID-19 situation. - The university developed the Chula COVID-19 Strip Test that can preliminarily diagnose the virus. - The university informed people who wanted to enter campus that they must scan the government's ThaiChana QR code to collect records for the Thai COVID Center (TCC). - The university's engineering faculty members and students created several technologies and projects to help to reduce the risk and impact of COVID-19: 1. The I2P Project (idea to product within 7 days) produced the Faceshield through cooperation between Chula Engineering and medical companies (Figure 1).

	2. Respirator Sterilization by UVC; Chula Engineering designed a method for reusing the N95 facemask. 3. Telepresence: Technologies that help medical staff care for COVID-19 patients via telecommunication (Figure 2) 4. Quarantine Delivery Robot: This robot functions to help medical staff care for COVID-19 patients by telecommunication with them and by delivering foods to them through long-range control (Figure 3). 5. Method for Checking PPE Suit before Usage: This method ensures that PPE suits can be used in real operations before they are dispensed to the medical staff. 6. The Negative Pressure Cabinet helps medical staff have a high level of safety while screening and treating COVID-19 patients (Figure 4). 7. Positive Pressure Innovation: Chula Engineering and the Faculty of Architecture developed this tool to help medical staff care for quarantined COVID-19 patients with less potential harm (Figure 5).
Recovery efforts after the hazard at your university	- After the COVID-19 situation peaked, Chulalongkorn University created a plan to recover losses by involving all stakeholders. 1. Proposed the 10 plus policy for helping students suffering due to the COVID-19 situation 2. For application to the 2020 semester, proposed the "New Normal" policy, focused mostly on social distancing and campus hygiene
Lessons learned from the event	The university wants to ensure that during the pandemic's next wave, the amount of loss is reduced and that its main functions continue. Therefore, the risk management plan should be reexamined to focus on a variety of risks and disasters. Based on the COVID-19 disaster, the university sees that information is a vital resource for understanding the situation, so it plans greater focus on real-time information dissemination through reliable social media.
Response efforts immediately after the hazard at your university	All of the following concepts related to the pandemic situation have been improved: **P**reparedness: Apart from the current focus on Covid-19, multi-hazards have been taken into consideration, together with development of new technologies. **R**esponse: Real-time responses, with effective solutions, need improvement for potential, near-future disasters. **M**itigation: Policies for mitigating damages from disasters should be created in cooperation with all university stakeholders so that no one is left behind.

Figure 1: I2P project

Figure 2: Quarantine Telepresent

Figure 3: Pinto, the quarantine delivery robot

Figure 4: Negative Pressure Cabinet

Figure 5: Positive Pressure

References

Chula Engineering. (2020). I2P. Retrieved August 08, 2020, from https://www.eng.chula.ac.th/th/i2p

Chula Engineering. (2020). *Respirator Sterilization by UVC*. Retrieved August 08, 2020, from https://www.eng.chula.ac.th/th/respirator-sterilization-by-uvc

Chula Engineering. (2020). "น้องกระจก" หรือ ระบบสื่อสารทางไกล Telepresence *ผู้ช่วยบุคลากรทางการแพทย์สู้ภัยโควิด-19*. Retrieved August 08, 2020, from https://www.eng.chula.ac.th/th/telepresence

Chula Engineering. (2020). น้องปิ่นโต (*Quarantine Delivery Robot*) หรือหุ่นยนต์พัฒนาเพื่อการขนส่งและการสื่อสารทางไกลเพื่อช่วยบุคลากรทางการแพทย์. Retrieved August 08, 2020, from https://www.eng.chula.ac.th/th/quarantinedeliveryrobot

Chula Engineering. (2020, April 17). *วิศวฯ ในสื่อ :คณะวิศวฯ จุฬาฯ ร่วมทดสอบมาตรฐานชุด PPE เพื่อให้บุคลากรทางการแพทย์ ใช้อุปกรณ์ป้องกันที่ปลอดภัย*. Retrieved August 08, 2020, from https://www.eng.chula.ac.th/th/27140

JNC Team. (2020, May 09). *รถความดันบวก "CU กองหนุน" สำหรับบุคลากรการแพทย์สำหรับดูแลผู้ป่วยช่วงกักกันตัวอย่างปลอดภัย*. Retrieved August 08, 2020, from https://thejournalistclub.com/รถความดันบวก-cu-กองหนุน/

Supot Teachavorasinskun, Professor, Chulalongkorn University
Natt Leelawat, Assistant Professor, Chulalongkorn University

THAILAND

OTHERS

University	Date / Year of disaster	Hazard Type
Khulna University	2019–2020	☒Natural ☒Biological ☒Technological ☐Chemical ☐Others (Protest etc. Please describe the hazard type here.)

Major damage caused by the hazard in general	i. Infrastructural damage ii. Environmental damage/Green bio-diversity loss iii. Termination of classes iv. Mismatch in academic calendar v. Failure or disorder of communication vi. Anxiety and mental stress
Major damage / impacts on campus (not only structural damage, but also non-structural such as termination of classes, events, etc.)	i. Electric poles were shattered, electricity remained off for several days owing to natural hazards (tropical cyclones like Bulbul and Amphan. In addition, several trees fell. ii. Tea stalls were hard-hit, and repair remained an arduous task. iii. Breakdown of necessary communication with students due to fragility of telecommunication services iv. Classes remained closed after the widespread biological hazard, i.e., COVID-19. v. Cultural events, ongoing extracurricular activities, and outdoor games were postponed. vi. Halls were immediately vacated, and administrative activities remained dysfunctional. vii. Final examinations were postponed, disrupting the academic calendar.
Major preparedness/ DRR measures prior to the hazard at your university	N/A
Response efforts immediately after the hazard at your university	i. Monitoring infrastructural damages and taking immediate steps to rectify where feasible ii. Communicating with students, faculties, and staffs about their conditions iii. Providing financial support to students and staff in dire need iv. Providing mental and physical health support to stakeholders
Recovery efforts after the hazard at your university	i. Gradually moving toward online classes ii. Preparing to start the new semester and minimizing the session gap iii. Developing an ICT platform for starting online course registration iv. Identifying and supporting affected students and their families v. Attempting to provide free Internet access for class attendance.

Lessons learned from the event	i. Appropriate authorities should be prepared for any natural and biological hazards. ii. Disaster preparedness education should be disseminated through training and organizing demonstrations for students and staff, for which thoughtful planning and preparation can help ensure safety. iii. Use hotline services for any emergency response—pre-, during, and post-disaster periods iv. Students, staff, and faculties should be trained to use digital platforms, i.e., taking classes, preparing video tutorial, conducting meetings, seminars, and so on via online technology.
Major changes / improvement in disaster risk management on campus before and after the event	i. Equipping the medical center with medical instruments ii. Prohibiting unknown visitors entering campus; establishing thermal scanning at the entrance, especially after the spread of COVID-19 iii. Through email, providing guidelines, important recommendations, and prescribed medicines to all faculties and staffs during the COVID-19 pandemic.

Md. Nasif Ahsan, Professor, Khulna University
Sk. Faijan Bin Halim, Khulna University
Sazia Ahmed, Khulna University
Mohammed Ziaul Haider, Khulna University

BANGLADESH

University	Date / Year of disaster	Hazard Type
BRAC University	2019	☐Natural ☐Biological ☒Technological ☐Chemical ☒Others (Fire in a high-rise building in the neighborhood)

Major damage caused by the hazard in genera	• Loss of lives, • Toss of property, • Trauma
Major damage / impacts on campus (not only structural damage, but also non-structural such as termination of classes, events, etc.)	No physical impact on teaching or administration, however, observing the fire, smoke, and desperate people jumping from upper floors created fear and trauma among students, teachers, and staff.
Major preparedness/ DRR measures prior to the hazard at your university	• There were fire extinguishers on each floor of the university's rented high-rise buildings. • Main spaces of each floor had smoke detectors. • Some high-rise buildings had operational fire escapes.
Lack of preparedness/ DRR measures	• Some high-rise buildings had non-operational fire escapes. • Some high-rise buildings had no fire escapes. • Smoke detectors did not cover all major areas. • No handheld fire extinguishers or towels were available in the premises. • No fire drills were conducted in the high-rise buildings.
Response efforts immediately after the hazard at your university	• Immediately after the fire, Postgraduate Programs in Disaster Management (PPDM) arranged an emergency meeting among teachers and staff of PPDM and Architecture. • A committee of teachers and staff of these two departments was formed, logged fire escapes, and discussed other university preventive and rescue measures the same day. The report (attached) was sent to the Pro-Vice Chancellor's office for action. • The Pro-Vice Chancellor formed a central committee for fire risk reduction and rescue at the university.
Recovery efforts after the hazard at your university	The fire did not occur inside the university.
Lessons learned from the event	• Refurbish each building with working fire escapes. These could be external types if there are no existing indoor shafts in the building. • Regular fire drills should be conducted. • Regular trainings on prevention of fire, fire extinguishers, escapes, etc. should be conducted.

Major changes / improvements in disaster risk management on campus before and after the event	• Fire hoses on each floor were checked and reactivated. • Handheld fire extinguishers and towels were supplied to classrooms, offices, the cafeteria, student lounge, auditorium, and library. • Trainings on fire extinguishers were conducted by the university. • Posters on awareness were posted on noticeboards. • PPDM conducted a major national seminar and workshop titled Fire Prevention and Rescue in collaboration with the Bangladesh Fire Department. • PPDM conducted a training and workshop open to all university students titled Workplace Safety in collaboration with Community Development for Peace (CDP), a voluntary youth organization.

fire and workplace safety training for senior management

Zainab Faruqui Ali, Professor, Brac University

University	Date / Year of disaster	Hazard Type
Bangladesh Agricultural University	July 22, 2018	☐Natural ☐Biological ☐Technological ☐Chemical ☒Others (Fire)

Major damage / impacts on campus (not only structural damage, but also non-structural such as termination of classes and, events etc)	• At the the university's "Bangabandhu Chattar" organized by BAU and its alumni association jointly on July 22, 2018 to celebrate enormous success and achievements of the university in the last 57 years, according to eyewitnesses, the stage suddenly caught fire at about 11:45 p.m. when it was being decorated. • The fire broke out very rapidly, and everything was burned to ash within 30 minutes. Worse, the huge fire threatened the faculty building, which contained valuable documents and a research laboratory, and the central library, which contained more than 2 million valuable books. • The fire's cause was not immediately known, but fire service officials suspected that it was generated by an electrical short circuit. Property damage reached approximately 60,000 USD, but fortunately, there were no injuries.
Response efforts taken immediately after the hazard at your university	Alerted, six firefighting units rushed in and had doused the fire by around 12:45 a.m. Firefighters worked relentlessly to stop the fire's spread in the faculty building and central library.
Recovery efforts taken after the hazard at your university	
Lessons-Learnt from the event	Based on this experience, Bangladesh Agricultural University initiated disaster management activities. • One key step was to develop a fire service and civil defense center on the university campus as a disaster management plan, actions not considered before the fire. • After the incident, the university administration began immediately cooperating with local government to construct an on-campus fire service unit that will be completed in the near future. • Prior to that, a disaster management action plan project team was formed, and a disaster management plan was initiated and implemented. • University administration is now working on all of the following: emergency response plans for various types of future disasters; providing preparedness training exercises for staff; finding methods of structural improvement and vulnerability assessment for mitigation; installation of fire extinguishers in buildings in an effort to save lives and stabilize incidents during the response phase; a debris management plan during the recovery phase.

Major changes / improvement made in terms of disaster risk management on campus compared to before and after the event

Several challenges and issues were identified in the context of the fire and the lessons learned:

- No prior plan and facilities for any kind of disaster including fire
- No proper link between the fire brigade and institutions prior to the incident
- Modern firefighting technologies required
- Potential resources not transferred to fire authorities to implement successful firefighting in a disaster
- Fire prevention not included in any educational syllabus

Figure 1. Photos illustrate the initial and final conditions of the devastating fire in 2018.
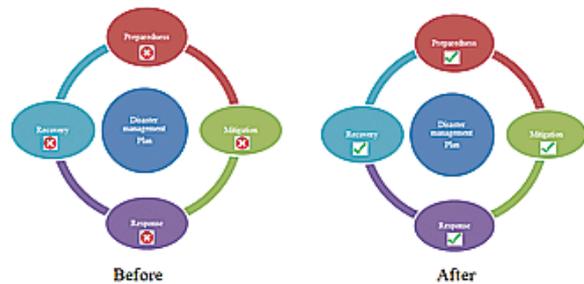

Figure 2. Conditions of disaster management plan before and after the fire incident in 2018.

Figure 3. Fire extinguisher installed in a building

Figure 4. Construction of a fire service and civil defense unit on BAU campus after the 2018 fire

Based on its experience of the fire, Bangladesh Agricultural University is now working on an efficient disaster management plan and improving associated facilities to reduce risk and possible damage and to better prepare for any future disaster.

Md. Hosenuzzaman, Bangladesh Agricultural University
Md. Anwarul Abedin, Professor, Bangladesh Agricultural University

University	Date / Year of disaster	Hazard Type
Sichuan University	May 12, 2008	☒Natural □Biological □Technological □Chemical □Others(Protest etc. Please describe the hazard type here.)

Major damage caused by the hazard in general	1. 69,227 people were killed, 374,644 were injured, and 17,923 were missing. 2. The direct economic loss caused by the Wenchuan earthquake was 845.2 billion Chinese yuan. 3. About one-fifth of cultural relics in Sichuan Province were damaged by the Wenchuan earthquake.
Major damage / impacts on campus (not only structural damage, but also non-structural such as termination of classes, events, etc.)	1. Sichuan University suspended classes until May 15th and then resumed classes. 2. Teachers and students spent nights on the open lawn and playground in camps, away from buildings. 3. Some public buildings such as office buildings, teaching buildings, and student dormitories on campus suffered damage to varying degrees. 4. Teachers and students' psychological state has been disturbed. Some students panicked, and some from the earthquake-stricken area could not contact their relatives or learn whether their hometowns had been affected by the disaster.
Major preparedness/ DRR measures prior to the hazard at your university	None.
Response efforts immediately after the hazard at your university	1. Sichuan University evacuated students, faculty, and staff to a safe zone in time. Teachers and students spent the night on the open lawn and playground, away from buildings. Sichuan University provided plastic equipment such as tents against the rainy night. 2. Various chemical reagents were properly handled to ensure safety. 3. The broadcast station, campus network, and other media broadcast the earthquake situation and anti-seismic measures in time to eliminate most teachers and students' panic. 4. Guards' management was strengthened, with a strict vehicle entry and exit system to avoid congestion on campus. Additional security personnel were assigned to important areas such as student dormitories to ensure normal school order. All night patrols were conducted, especially where students were concentrated. A patrol car with a horn repeatedly publicized the school's various notices to students.

On the second day after the Wenchuan earthquake, students took refuge on Jiang'an campus of Sichuan University.

On the second day after the Wenchuan earthquake, students took refuge on Jiang'an campus of Sichuan University.

Recovery efforts after the hazard at your university	• After the Wenchuan earthquake, the Department of Planning and Construction immediately organized a team to conduct comprehensive investigation of the public teaching buildings and student dormitories. Relevant experts and technicians from the School of Architecture and Engineering Design conducted consultations on some damaged buildings and determined that some housing should be temporarily suspended. • At the same time, the Department of Planning and Construction continued to investigate the library, the first through ninth teaching buildings, the kindergarten, the defective center of the second hospital, and the old public health building to eliminate dangers and ensure needs for continuing normal classes.
Lessons learned from the event	It is necessary to implement policy focusing on prevention, including effective earthquake protection before disasters, reinforcement of buildings with weak earthquake resistance, popularization of scientific knowledge to the public, regular earthquake prevention drills, emergency plans, and emergency preparedness. The earthquake resistance of the university's buildings can be improved.
Major changes / improvement in disaster risk management on campus before and after the event	• Sichuan University and Hong Kong Polytechnic University jointly established the "Sichuan Earthquake Reconstruction Support and Research Center," which conducts multi-disciplinary and interdisciplinary scientific research, personnel training, and social services covering three major areas: comprehensive rehabilitation and nursing services, psychological counselling and community reconstruction, and construction management and engineering technology. • What's more, the two universities used the "Sichuan Earthquake Reconstruction Support and Research Center" as a cooperative platform to conduct research on topics related to earthquake prevention, rescue work, and community reconstruction. • Besides, through both parties' cooperative scientific research and training services, they actively participate in helping optimize reconstruction work in the disaster area. Additionally, the center will

regularly organize training courses for key personnel and professionals in related disciplines and train a large number of excellent nursing staff, prosthetic orthopedic professionals, community reconstruction staff, psychological counsellors, engineers and construction workers for earthquake-stricken areas. Management personnel and other urgently needed talents for post-disaster reconstruction will be organized.

- The two schools cooperated especially in prosthetics and orthopedics, rehabilitation treatment, nursing, psychological counselling, clinical psychological support for children and families, community capacity building, renewable energy, water conservancy and environmental engineering, geotechnical and structural engineering, construction and quality management, geodynamics, and other aspects, jointly to serve reconstruction in the disaster-stricken area and provide talent, intelligence, discipline, and scientific guarantees.

A week after the Wenchuan earthquake, students of the West China Campus of Sichuan University took refuge on the playground.

Dr. Bingwei Tian, Sichuan University
Cheng Zhou, Sichuan University
Haolun Luo, Sichuan University

CHINA

University	Date / Year of disaster	Hazard Type
Tsinghua University	2020	⊠Natural □Biological ⊠Technological ⊠Chemical □Others(Protest etc. Please describe the hazard type here.)

Major damage caused by the hazard in general	• From campus flooding due to strong, heavy rains, buildings and cars may be destroyed. • Some students might have problems leaving buildings. • In fires and earthquakes, people might be injured, and buildings destroyed. • For CBRN disasters at campus laboratories, people might be injured, and air is liable to be polluted.
Major damage / impacts on campus (not only structural damage, but also non-structural such as termination of classes, events, etc.)	Termination of classes and outdoor activities, power shortages, inconvenient and difficult living, collapse of buildings, human casualties
Major preparedness/ DRR measures prior to the hazard at your university	For earthquakes: Reinforcement of buildings For campus flooding: Underground water pipes changed and water pumps available For fire and/or explosion: Introduction of various policies. Electric cars banned from charging in some places. Campus fire inspection every 6 months. November 9 designated as fire day/ firefighting facilities exercise, with drills conducted. Cleaning of combustible building materials on campus. Emergency plans available for some laboratories to prevent fires and explosions. For campus crime: Alarm pulls installed in many places on campus. Video-cameras installed. For traffic accidents: License plate recognition, speeding alerts, parking control, special times for bicycle passage. Vehicles prohibited at certain places/playgrounds.
Response efforts immediately after the hazard at your university	For COVID-19: A fever clinic in the school hospital. Students returning to school from high risk areas are quarantined. University health code app for reporting temperatures and building entry and exit required in mobile phones. Facemasks required in crowded rooms. Campus control entry (green required for Beijing Health Code app). Seat separation required for some places. Online courses provided for foreign students who are overseas. Liquid soap and other hand cleansers provided.
Recovery efforts after the hazard at your university	Recovery efforts for COVID-19: Students return to school on different days. Students returning from high risk areas are required to be tested. Classes are taught in classrooms and are available online.

Lessons learned from the event	The university plans and prepares for the worst case scenario. Resources are available. Students are informed, prepared, and tested.
Major changes / improvement in disaster risk management on campus before and after the event	Changes in teaching methods: Offline classes combined with online classes Restriction of tourists coming onto campus Health code used entering for campus and buildings Temperature test required for entry to some buildings Some student activities postponed

Hui Zhang, Professor, Tsinghua University

MEXICO

University	Date / Year of disaster	Hazard Type
Instituto Tecnológico y de Estudios Superiores de Monterrey	September 19, 2017	☒Natural ☐Biological ☐Technological ☐Chemical ☐Others(Public Health)

Major damage caused by the hazard in general	❖ Loss of human lives ❖ Several injuries ❖ Temporary suspension of academic and administrative activities ❖ Structural damages (some structures collapsed) ❖ Reputational damages
Major damage / impacts on campus (not only structural damage, but also non-structural such as termination of classes, events, etc.)	❖ Damage to the health and physical, and mental well-being of the community ❖ Interruption of basic services (electricity, gas, water, and IT network) ❖ Temporary suspension of campus activities
Major preparedness/ DRR measures prior to the hazard at your university	❖ Analysis, evaluation, and management of risk ❖ Generation of a plan for attention to and mitigation of risks, including earthquake ❖ Improvement of a massive internal alert and notification system ❖ Signaling of evacuation routes, meeting points, lower-risk areas, and dangerous spaces ❖ Determination of an emergency care team (brigade members) ❖ Response team training ❖ Response team training (drills) ❖ Compliance with state and municipal Civil Protection
Response efforts immediately after the hazard at your university	❖ The seismic warning system was activated. ❖ Once seismic movement stopped, the Evacuation System was activated and with it, evacuation of the entire university community began. ❖ Emergency search-and-rescue services of Mexico City were notified. ❖ Conditions in which critical facilities were found (electrical energy, hydraulic systems, computer networks, liquefied petroleum gas, and elevators) were reviewed, ruling out risky or dangerous conditions. ❖ Once the university community gathered at established meeting points, psychological first aid was given. ❖ First aid and medical care posts were established, ❖ A community census was conducted. ❖ People search-and-rescue operations were conducted within buildings. ❖ Closed-circuit television (CCTV) recordings were reviewed to verify victims' locations in collapsed structures. ❖ A primary review and evaluation of physical damage to facilities and infrastructure was conducted by brigade personnel.

	❖ Academic and administrative activities were suspended, in order to conduct an exhaustive safety structural review with support of experts in structural engineering. ❖ Once activities were suspended, teaching, administrative, and service personnel were authorized to leave the facilities. ❖ A review of laboratory facilities was requested by the municipality's Civil Protection. ❖ Areas were established for concentration and reunion of students, collaborators, and their families. ❖ Energy bar and hydration zones were established for the community. ❖ A command and coordination center was established to direct search-and-rescue service and cadaver-recognition service. ❖ A call center was established to respond to doubts and concerns of parents and relatives of the university community.
Recovery efforts after the hazard at your university	❖ A DRO conducted a structural safety analysis to define damage to buildings and a strategy for asset recovery and, subsequently, to present to authorities. ❖ An area was established temporarily in the vicinity of the campus for continuity of academic activities. ❖ The process of restoration and reconstruction of infrastructure began.
Lessons learned from the event	❖ Guarantee that personnel are trained in all study and work areas for management of natural disasters or other crises. ❖ A crisis management committee for each campus, led by the campus director, must be established, trained, and prepared for crisis management. ❖ Greater involvement of leadership is needed in organization of prevention and action during crises. ❖ Extend such training and education to student and teacher communities and involve them in response action plans. ❖ Include greater involvement of management personnel. ❖ An earthquake can generate generalized psychosis if the community's emotions are not dissipated. ❖ Lack of care from qualified psychological personnel after a disruptive event can greatly impact community members. ❖ After a disruptive event, if criminal behaviors arise, keeping the university community within a protected environment is important, while also containing the city's security problems.
Major changes / improvements in disaster risk management on campus before and after the event	❖ Delegate responsibility to the highest-ranking manager by campus so that the manager can designate, train, and prepare an emergency response team. ❖ Allocation of human and financial resources is necessary to extend and maintain the general emergency alert system in an optimal condition. ❖ Collaborative worktables were established with government agencies for training, attention, and response to disruptive natural events. ❖ Support networks were developed with neighboring organizations, providing material and human resources for better care during disruptive events, including those caused by human beings.
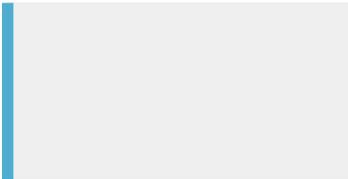
❖ Participation in workshops, seminars, and events that, in terms of civil protection, keep us up to date in techniques of attention and containment of unwanted events with natural and anthropogenic origins.

Antonio Bellorin, Instituto Tecnológico y de Estudios Superiores de Monterrey

University	Date / Year of disaster	Hazard Type
University of Peshawar	December 2017 terrorist attack on the Agriculture Research Institute	□Natural □Biological □Technological □Chemical ☒Others (Terrorist Attacks)

Major damage caused by the hazard in general	On December 2017, terrorists attacked the Agriculture Research Institute, opposite University of Peshawar, killing 9 people and wounding 35 others.
Major damage / impacts on campus (not only structural damage, but also non-structural such as termination of classes, events, etc.)	• 9 people killed and 35 others wounded • Psychological trauma • Termination of classes; events and mass gatherings prohibited on campus • On-campus research activities were also hindered. • Previously scheduled events were postponed. • There was chaos because the media incorrectly disseminated news that the attack was on Agriculture University Peshawar where hundreds of students are from far-flung areas and staying at hostels.
Major preparedness/ DRR measures prior to the hazard at your university	• As a preparedness measure, security checkpoints are installed at each entrance of the university. • Barriers are also installed at each entrance. • Parallel to the checkpoints, an emergency response mechanism is formulated by security agencies to respond in a timely and efficient way. • Rescue 1122 team is available 24/7 on campus; they respond to any medical emergency within 5 minutes. • Regular search-and-rescue exercises by Rescue 1122
Response efforts immediately after the hazard at your university	• The police force responded, and all the terrorists were killed. • Classes were terminated. • Entrances were closed, and police were assigned to ensure closure until further notice. • Rapid search operations in the University's hostel to look for any suspicious persons. • Against terrorist activities, a well-managed plan is formulated to respond in a timely and efficient way.
Recovery efforts after the hazard at your university	• The government took responsibility for treatment of injured students and staff.
Lessons learned from the event	• The university authority, staff, and students highlighted the importance of preparedness in emergency response. • Felt need of trained human capital • Focused on trained volunteers • An Emergency Response Plan in which all participants know their roles and responsibilities is essential.

	• The University Police, Elite Force have developed the Safe Evacuation Plan. • The university has strengthened coordination mechanisms with stakeholders. • An early warning system capable of monitoring and disseminating information to authorities was installed for the campus at police stations. • More informed decision making • Checkpoints at university entrance • Emergency response plan prepared by on-campus police. • Ban on unauthorized persons on departments' premises.
Major changes / improvements in disaster risk management on campus before and after the event	• Checkpoints at each entrance of campus • Emergency response plan • CCTV cameras installed at entrances and key parts of the university • Availability of Rescue 1122 team 24/7 on campus • Trace record of every visitor to departments • Police patrolling campus 24/7 • At each department and hostel entrance, a designated official records visitors' biodata. • Hostels are protected by barbed wire. • Volunteers groups conduct departmental sessions on first aid and emergency response.

Dr. Atta-ur-Rahman, University of Peshawar
Imran Khan, University of Peshawar

PAKISTAN

University	Date / Year of disaster	Hazard Type
University of Peshawar	Jan 2013 Terrorist attack on the Institute of Islamic and Arabic Studies	☐Natural ☒Biological Technological Chemical ☒Others (Terrorist Attacks)

Major damage caused by the hazard in general	In January 2013, five students received minor injuries when an explosion went off in the conference hall of the Institute of Islamic and Arabic Studies. About 1 kg of explosive material was used, causing damage to infrastructure.
Major damage / impacts on campus (not only structural damage, but also non-structural such as termination of classes, events, etc.)	• Multi-story Academic Building jolted by the strong wave of the blast • Psychological trauma and post-traumatic stress • Termination of classes; events and mass gatherings prohibited on campus • On-campus research activities hampered
Major preparedness/ DRR measures prior to the hazard at your university	Peshawar remained a hotspot of terrorist activities for about 1.5 decades, and educational institutes have been targeted many times. Preparedness/DRR measures include: • Security checkpoints installed at each university entrance • An emergency response mechanism formulated by security agencies to respond in a timely and efficient way • At each department's entrance, a designated official records biodata of each visitor.
Response efforts immediately after the hazard at your university	• The injured were immediately taken to the nearby Khyber Teaching Hospital. • The concerned department immediately called police for the initial enquiry. • Search-and-rescue operation by the Rescue 1122 team • Classes were terminated for a few days to prevent a further such event. • Rescue 1122 team available on campus 24/7 to respond to any medical emergency within 5 minutes • Against terrorist activities, a well-managed plan is formulated to respond in a timely and efficient way.
Recovery efforts after the hazard at your university	• Emergency treatment of injured students • Counselling of students and staff to stabilize their mental health • Cracked walls and broken windows were repaired.
Lessons learned from the event	• Checkpoints at university entrance • Emergency response plan prepared by on-campus police • At each department's entrance, a designated official notes every outsider's name, mobile number, National ID number, address, and purpose of visit.

	• Ban on unauthorized persons to departmental premises
Major changes / improvements in disaster risk management on campus before and after the event	• Checkpoints at each campus entrance • Emergency response plan • Availability of Rescue 1122 team 24/7 on campus • Trace record of every visitor to departments • Police patrolling campus 24/7

Dr. Atta-ur-Rahman, University of Peshawar
Imran Khan, University of Peshawar

PAKISTAN

PAKISTAN

University	Date / Year of disaster	Hazard Type
University of Peshawar	2010 Floods	☒Natural ☐Biological ☐Technological ☐Chemical ☐Others (Protest etc. Please describe the hazard type here.)

Major damage caused by the hazard in general	Although the flood didn't directly affect the University of Peshawar, surrounding villages and towns were inundated, resulting in huge loss of lives, property, infrastructure, and livelihood of the masses.
Major damage / impacts on campus (not only structural damage, but also non-structural such as termination of classes, events, etc.)	• The flood 2010 not only eroded roads but also damaged doors, gardens, roofs, and furniture in nearby townships and villages. • Faculty members whose houses were affected sheltered on campus. • The 2010 flood affected classes, daily games, and sports on playing fields due to floods around the country and heavy rainfall on campus.
Major preparedness/ DRR measures prior to the hazard at your university	• The campus has good water/drainage channels that are usually cleaned by the cleaning staff. • Trees are planted to avoid erosion and keep the campus green. • The university conducts an annual exhibition on Disaster Risk Reduction (DRR) in which thousands of students, faculty members, and other adjacent institutions participate and receive updated knowledge about natural and human induced disasters. • The campus has developed student societies including a culture society, a student welfare society, and a proctorial board. • The University Police Elite Force closely observes the entire campus and immediately responds to any mishap.
Response efforts immediately after the hazard at your university	• Several students have conducted their Master's, Master's of Philosophy, and Doctoral degrees on 2010 floods and published their work in well-regarded journals • Academia continuously provides support to government organizations on policy making, planning, and development regarding natural calamities. • Universities, in joint ventures with the government, INGOs, and other stakeholders, conduct projects on disaster risk management.
Recovery efforts after the hazard at your university	• University staff, teachers, and students actively participated in fundraising campaigns, volunteerism, mass sensitization, and research. • The affected (University employees) were accommodated on campus.
Lessons learned from the event	• Importance of preparedness in emergency response • Felt need for trained human capital and volunteer training • Emergency Response Plan • The University Police Elite Force developed the Safe Evacuation Plan. • Helpful tools and technology are enhanced on campus for emergency response, first aid, evacuation, cleaning, fire extinguishers, and security.

	• Early warning system for the campus, capable of monitoring and disseminating information to authorities installed at police stations
Major changes / improvements in disaster risk management on campus before and after the event	• Mass sensitization and preparedness • Volunteer groups have been developed to conduct departmental sessions on first aid and emergency response. • The university regularly organizes awareness campaigns, for instance, the DRR exhibition and Tree Plantation for students, faculty members and support staff.

Dr. Atta-ur-Rahman, University of Peshawar
Imran Khan, University of Peshawar

PAKISTAN

University	Date / Year of disaster	Hazard Type
University of the Philippines Diliman (UPD)	On April 22, 2019, an earthquake of 6.1 magnitude hit Luzon, Philippines, with an epicenter near Bataan. Aftershocks followed. Tremors of Intensity 4 were felt in Quezon City. Another earthquake with 5.3 magnitude hit parts of Luzon, Philippines on 13 September 2019.	☒Natural ☐Biological ☐Technological ☐Chemical ☐Others

Major damage caused by the hazard in general	After the 22 April 2019 earthquake, inspectors declared one building to be structurally unsafe due to major damaged beams and columns. There were severe spalling of concrete covers of beams and floor slabs; cracks on wall-column and wall beam junctions in all floor levels; cracks on the floor at the fourth floor (overhang part); deflection of second floor beams; bulging of partition walls due to beam deflection; partition walls at the 4th floor were detached from the upper beams and might fall; horizontal crack in one of the columns at the second floor; and ground subsidence at the front portion of the building. Five out of 60 buildings had more than 20 to 30 cracks in their walls, beams, and columns possibly due to subsidence or settlement; 38 buildings had minor cracks on walls, beams, column, or floors, others had vertical cracks on columns, had falling hazards or water leakage; 5 buildings had pre-existing or old cracks on their walls. The rest of the buildings had no structural issues. (Please see Annex A for the pictures)
Major damage / impacts on campus (not only structural damage, but also nonstructural such as termination of classes and, events, etc)	• As a result of the 22 April 2019 earthquake, classes and work in UPD were suspended by the Chancellor on April 23, while UPD offices in Pampanga and Olongapo were suspended on April 23 and 24. • Upon the recommendation of a team of experts, one building was declared "off-limits". There were certain areas on the first and second floor of another building that was also declared "off-limits" for wall repairs. Affected personnel vacated the unsafe buildings and were relocated to another building.
Major preparedness/ DRR measures that have been taken prior to the hazard at your university	• The University conducted an Orientation Workshop on University-Based DRRM, "Diliman DRRM Summit 2016" on 3-4 May 2016 and outlined the proposed UPD Overall Disaster Risk Reduction Management Plan to be drafted by the UPD Overall DRRM Committee and its sub-committees. These committees were created as per AO No. MLT–16-104 dated 30 June 2016 and were renamed on 09 August 2019, in consonance with the terminology used in the National Disaster Risk Reduction and Management Council (NDRRMC) per RA 10121 or the Philippine Disaster and Risk Reduction Management Act of 2010. • Based on the political geography, land use plan, population, and existing structure of UPD, 15 zones (after Abiera 2015) were identified

for disaster planning purposes. The following priority hazards were identified: stormwind, flood, fire, earthquake, and human-induced threat.

- In anticipation of "The Big One," the UP President and the UPD Chancellor enjoined everyone to participate in the Nationwide Earthquake Drill on 29 June 2017. (Please see *Annex B* for the pictures)Some UPD units also participated in the 4th Metro Manila Shake drill as per CHED's Memorandum No. 25.

  2018. The drill was held on July 18, 2018. (Please see *Annex C* for the pictures)
- As part of the capacity-building measure of the University in the event of an actual disaster, the Chancellor issued Memorandum No. MLT–19-052 dated 31 January 2019, encouraging everyone to participate in the University-wide earthquake drill on 27 February 2019. This was later amended to 21 February 2019 when the Office of the President of the University of the Philippines issued Memorandum No.TJH-2019-06 instructing all Chancellors to participate in the NDRRMC's nationwide earthquake drill on 21 February 2019. The UPD Chancellor then issued Memorandum No. MLT-19-079 dated 18 February 2019, encouraging all UP units to participate and submit the accomplished forms on various phases of the activity: Pre-, intra- and post-drill that was provided by the UP Resilient Institute. 31 UPD academic units joined the drill on February 21. (Please see *Annex D* for the pictures)

- Acquired funding in the amount of Php13,985,230.00 to purchase supplies and equipment needed in cases of emergency response operations within UPD.

- Conducted initial discussion with the Philippine National Red Cross on 6 February 2019, to draft a Memorandum of Agreement to identify areas to be tapped as emergency sites, the equipment, or other structures to be prepositioned in the event of a large-scale disaster.

Response efforts taken immediately after the hazard at your university	- A *Rapid Evaluation Team*, composed of technical experts was immediately created to assess possible earthquake damage in buildings. - The UPD office Building Administrators (BA) immediately began inspecting dormitories and academic buildings for safety. They were briefed by the Team for an initial quick inspection of buildings to identify signs of earthquake damage, structurally as well as in terms of utility lines (water and electricity). - A one-page quick inspection checklist was provided and pictures were also taken of the observed issues. The engineers from the Office of the Campus Architect, Campus Maintenance Office and the College of Engineering came in for a more extensive inspection when warranted. Due to several aftershocks, the monitoring and inspections were a continuing process. The Team prioritized buildings to inspect further based on the reports of the BA.

Recovery efforts taken after the hazard at your university	When the second earthquake hit Quezon City in September 2019, the response of the same team to assess the damages in the University's buildings after the April 2019 earthquake was easier and faster since the procedures were already in place.
Lessons-Learnt from the event	The University needs to: • Activate the UPD Overall DRRM Committee that was reconstituted by the Chancellor on 09 August 2019 and plan a workshop to (a) complete the UPD DRRM Plan using the Florida International University's plan as a reference, and (b) finalize the structure and composition of the UPD Incident Command System. The UPDDRRM Plan [Outline] was approved in the May 2016 UPDDRRM Summit. • Activate the Disaster Risk Management and Safety Team (DRMST), a newly created unit that was approved by the Board of Regents on 25 July 2019. The DRMST which is directly under the Public Security and Safety Office has a primary task to mainstream safety protocols and disaster risk preparation, as well as to mobilize UPD's personnel and assets to respond in times of emergencies and disasters. The DRMST will also serve as the University's Incident Command Structure when activated during emergencies and disasters. • Activate a pro-active DRRM Committee per academic unit or zones. The 15 identified zones (or clusters) will guide the customization of local plans at their units. Evacuation plans should be identified based on the zoning of structures, to accommodate the members of both the academic and non-academic community. • Develop a disaster emergency plan/guideline/standard operating procedure for the priority hazards identified: stormwind, flood, fire, earthquake, and human-induced threat (while waiting for the finalization of the UPD DRRM Plan). These guidelines should be readily available and accessible for everyone (i.e. publication of a printed and online manual). • Clear the delegation of authority between the Office of the Vice Chancellor for Community Affairs and the Office of the Vice Chancellor for Development when responding to building structure disaster-related concern since the latter is the office in-charge in managing the infrastructure and physical resources of UPD. • Define the relationship of DRRM involvement between UP Diliman and other units or locators inside the campus such as UP Resilience Institute, Project Noah, Philippine National Red Cross, etc. • Realize the construction, operation, and maintenance of a Fire Station on campus as per agreement entered between officials of UP Diliman and the Bureau of Fire Protection on 13 February 2017.

	• Conduct an assessment and inventory of UPD's resources, identify its gaps and establish links with organizations, institutions, etc. to reinforce the gaps. Maintain a directory of hotlines for physical and psychosocial needs during times of emergency/disaster.
	• Ensure that all offices/units are equipped with the necessary equipment, alarms, and others which will help them during disasters (e.g. fire alarm system, sprinklers, and fire extinguishers) and the placement of necessary signages (e.g. fire exit signage). Encourage cluster units to conduct regular drills, assessment of potential security and safety risks such as structural inspection, among others.
Major changes / improvement made in terms of disaster risk management on campus compared to before and after the event	Encouraged units to create their DRRM committees and conduct regular safety drills aside from the Universitywide, local, and national initiated drills.

Annex A : Photos of cracks and damages in UPD buildings after the 22 April 2019, College of Fine Arts

Annex B : Nationwide Earthquake drill, 29 June 2017 In anticipation of "The Big One"

Annex C : Metro Manila Shake Drill, 19 July 2018

Quezon Hall. Photo from the UPRI website.
https://resilience.up.edu.ph/upcoming_events/university-of-the-philippines-participates-inmetro-manila-shake-drill-2018/

Fidel R. Nemenzo, DSc., Chancellor, University of the Philippines Diliman (UPD)
Alfredo Mahar Francisco A. Lagmay, Professor, University of the Philippines Diliman (UPD)

University	Date / Year of disaster	Hazard Type
Asian Institute of Technology (AIT)	October 21, 2011 (Flood)	☒Natural □Biological □Technological □Chemical □Others (Protest etc. Please describe the hazard type here.)

Major damage caused by the hazard in general	An initial estimate shows that AIT has sustained one billion Thai Baht in overall damages (infrastructure, academic laboratories, equipment, etc.) (AIT, Nov. 2011).
Major damage / impacts on campus (not only structural damage, but also non-structural such as termination of classes, events, etc.)	• Floodwaters rose to three meters in some areas of campus. • Ground floors of academic (including offices) and residential buildings were submerged for about a month and severely damaged. • The campus landscape was totally destroyed. Even several months after the flood, trees continued to be uprooted. • Things residents could not move to second floors, such as cars, motorbikes, and bicycles, were damaged. • Termination of classes, postponement of research meetings, etc. • Research proposal defenses and final thesis defense examinations postponed • Students had to return to their home countries, creating an additional financial burden. Students who could not return home were evacuated by the AIT. • The campus was temporarily moved to Stamford University, Hua Hin, Thailand, and Silipakorn University, Petchaburi Information Technology (IT) Campus, Cha-Am, Thailand, where classes continued until the AIT campus was restored. • The graduation ceremony was postponed from December 2011 to January 2012. • The odor of rot and water damage lasted for a long time in some buildings and campus areas. On some ground floors of academic buildings, we can still see floodwater stains and high-water marks, reminding us of the flood of 2011 2011.
Major preparedness/ DRR measures prior to the hazard at your university	Thailand Flood 2011 was worst the flood in 50 years. It affected more than 4 million people in Bangkok and provinces north of Bangkok. At the time, AIT had less preparedness for addressing a flood of such unprecedented scale.
Response efforts immediately after the hazard at your university	• Committees were organized to make appropriate decisions and responses to the disaster. • Important documents, books, PCs, and experimental equipment on ground floors of academic and residential buildings were moved to second floors. • Respective school program chairs were assigned to assess students' status, whether students were returning home or staying on campus and arranging evacuation for those staying. • The campus was moved to Stamford University, Hua Hin, Thailand. The institute arranged to shift students, staff, and faculty to accommodations in hotels and apartments. AIT paid any difference in rent between AIT and new accommodations.

	• Campus relocation was very carefully planned in response to a flood emergency on an unprecedented scale.
Recovery efforts after the hazard at your university	• Water was pumped out of campus with mobile pumping stations. • Cleaning damaged landscapes and areas on campus was undertaken once water was pumped into nearby canals. • Damage assessments and professional cleansing operations began. • The beautiful AIT campus landscape was restored. • Ground floors of academic and residential buildings were restored. • Various fundraising calls were circulated among AIT alumni and major donor partners.
Lessons learned from the event	Lessons learned from the Flood Disaster 2011, summarized by AIT News Letter https://www.ait.ac.th/2012/01/floods-in-asia-lessons-to-be-learned-from-thailand/ (26th January 2012) were: • Inability to cope with consequences of flooding on an unprecedented scale contribute to a major disaster. • Land use, urban development, industrial activities. and water management planning must be coordinated. • Institutional reforms and assigned responsibilities on responding to disasters should be clearly defined. • Scientific knowledge on flood simulation should be realistic and included in planning and policymaking. • The recovery phase should include not only reconstruction of infrastructure but the trust and confidence of people in governance response for managing disasters.
Major changes / improvements in disaster risk management on campus before and after the event	• The campus has recovered and been renovated from disaster loss in the 2011 flood. • AIT designated the Vice President Administration as the responsible person for disaster risk management (now evident during COVID 19 crisis management). • AIT is more vigilant in disseminating information. • The library's books and periodicals section has been moved to the second floor for protection. • AIT is more concerned about building and infrastructure insurance, especially for natural hazards.

Indrajit Pal, Assistant Professor, Disaster Preparedness, Mitigation and Management, Asian Institute of Technology (AIT)
Parmeshwar Udmale, Post-Doctoral Research Associate, Department of Development and Sustainability, AIT
Kullanan Sukwanchai, Doctoral Student, Disaster Preparedness, Mitigation and Management, AIT

ACKNOWLEDGEMENT

We would like to extend our sincere appreciation to the authors of each case study for their contribution and efforts to share their experiences and pictures. Some were prepared by disaster researchers and faculty members, while others were prepared by experts and managers in a crisis management office. These case studies do not represent overall responses by universities; rather, some of them are initiatives by departments and offices belonging to universities.

In addition, our appreciation goes to Ms. Sayaka Kobayashi, a staff member of the Regional and Urban Reconstruction Research Division of IRIDeS, who made tremendous efforts to compile these case studies and render this publication more attractive and meaningful.