

Sendai Framework for Disaster Risk Reduction

**Methodology to Estimate Damages to Infrastructure and Interruptions
to basic services to Measure the Achievement of Target D**



Sendai Framework for Disaster Risk Reduction

Target (D):

*Substantially reduce disaster **damage to critical infrastructure and disruption of basic services**, among them health and educational facilities, including through developing their resilience by 2030*



Monitoring global target (D)

Scope of the indicators

What is a indicator?

An indicator, as the word itself suggests, is a number (or index) that gives an **indication**, in this case of the increase or not of damages to infrastructure and interruptions to basic services.




Monitoring global target (D)

Challenges of indicator D:

- it refers to two **different** but **interrelated** situations:
1-critical infrastructure is damaged, 2- basic services are interrupted.
- Damage may interrupt or not services.
- Interruptions can happen without damage
- Interruptions may be partial
- Length of interruptions are variable
- Service may not be interrupted by provided with (varying) lower quality
- Coverage of the interruption may vary

Monitoring global target (D)

Countries and Secretariat recommendations to monitor the damage to several critical infrastructures at either global or national levels

Infrastructure Sector 	Recommended to be monitored at <u>global level</u>	Recommended to be monitored at <u>national level</u> depending on the needs and context of each country
Education	X	X
Health	X	X
Transport	X (road)	X Other transportation (e.g. airport, seaport, railway, etc.)
Energy	X	X (including Nuclear, Other)
Communications	X	X (ICT Sector)
Finance		X
Food		X (Agriculture, Livestock, Irrigation)
Water	X	X
Sewerage	X	X (Sewage, Waste)
Government	X	X
Safety/Security		X
Emergency services	X	X

Color coding:

X Available quantitatively in 91 National loss databases (i.e. # schools)

X Available qualitatively in 91 National loss databases (Affected: Yes/No)

X Not currently available in most National loss databases



Monitoring global target (D)

Indicators proposed:

-
- **D-1** Damage to critical infrastructure due to hazardous events. This indicator should be computed based on indicators D-2, D-3, D-4 and D-5.
 - **D-2** Number of health facilities destroyed or damaged by hazardous events
 - **D-3** Number of educational facilities destroyed or damaged by hazardous events
 - **D-4** Number of road infrastructures (measured in linear Mts) destroyed or damaged by hazardous events
 - **D-5** Number of times basic services have been disrupted or affected due to hazardous events. (list of services proposed)
-



Monitoring global target (D)

Basic Services proposed to be monitored globally indicator D:

Education (D-2)	(no. of facilities affected)
Health (D-3)	(no. of facilities affected)
Transport (D-4)	(mts. of roads damaged)
Energy (D-5a)	(y/n affected)
Communications (D-5b)	(y/n affected)
Water (D-5c)	(y/n affected)
Sewerage (D-5d)	(y/n affected)
Government (D-5e)	(y/n affected)
Emergency services (D-5f)	(y/n affected)

Indicators D2, D3, D4 are to be reported quantitatively for usage also in Target C Direct Economic Losses. **It is suggested, to reduce burden, that D-5a to D-5f are reported as service/infrastructure affected qualitatively (Y/N)**



Monitoring global target (D)

indicator D1:

The Secretariat proposes several options to calculate the index, all of them following this general pattern:

D1=Index of Critical Infrastructure Damage and Service Interruptions =
number of times interruption or damage happens / population * 100,000

Where “number of times interruption or damage happens” can be determined as:

- Simple count of number of events in which an interruption or damage is accounted for.
- Consolidated count of interruptions or damages per sector.
- Consolidated count of interruptions or damages per sector with emphasis on health and education.



Monitoring global target (D)

Options to calculate number of Interruptions:

1. **Simple count of number of events in which an interruption or damage is accounted for:** this method will count the number of records in the national disaster database that contains damage or interruption to any service.
2. **Consolidated count of interruptions or damages per service.** This method will sum the number of sectors affected per record for all records. Situations in which more than one sector has been affected will contribute more to the sum.
3. **Consolidated count of interruptions or damages per sector with emphasis on health and education.** This method will sum the number of sectors different of health and education, and will add the number of schools and health facilities affected, for all records. Situations in which more than one sector has been affected, or more than one school or health facility was affected will contribute more to the sum.



Monitoring global target (D)

THANKS