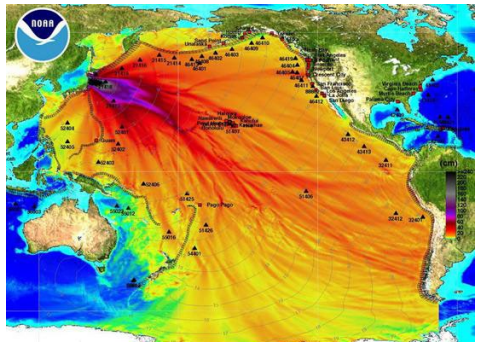
50 centimeters of tsunami

METHODOLOGY

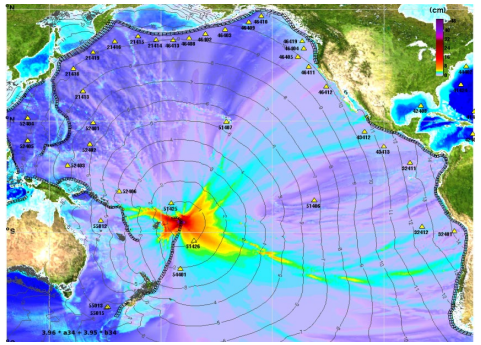
Comparison of tsunami impacts

2011 Great Tohoku Tsunami, Japan

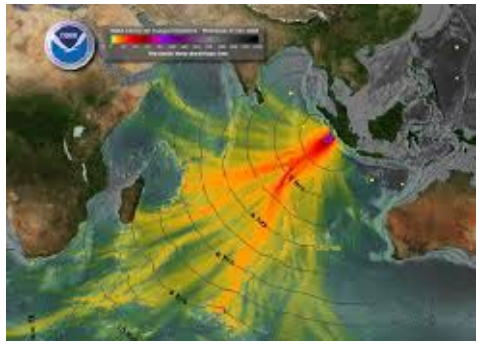


2010 Tsunami Chile

2009 Tsunami Samoa



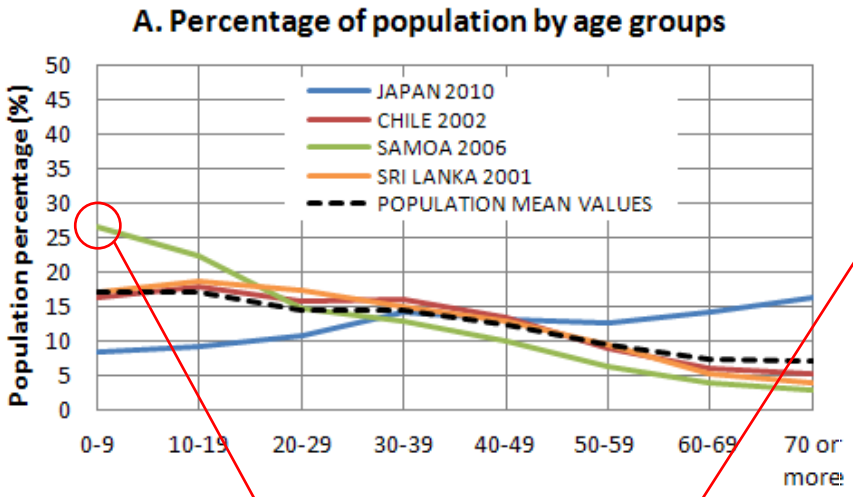
2004 Indian Ocean Tsunami (Sri Lanka, Thailand)

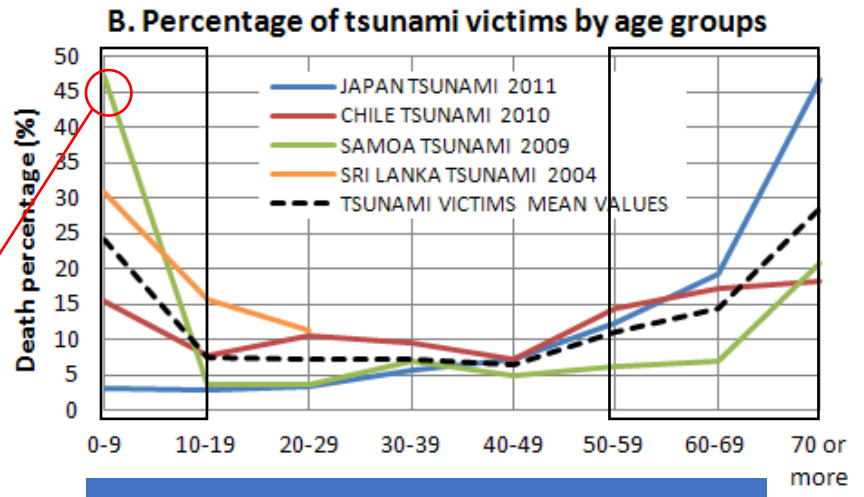


	2011 Great Tōhoku Tsunami	2010 Chilean Tsunami	2009 Samoan Tsunami	2004 Indian Ocean Tsunami
Date	11/03/2011 (Friday)	27/02/2010 (Saturday)	29/09/2009 (Tuesday)	26/12/2004 (Sunday)
EQ magnitude	9.0 Mw	8.8 Mw	8.1 Mw	9.1 Mw
EQ LT	14:46:24 JST	03:34:11 CLT	06:48:10 WST	06:28:53 IST (SL); 08:28:53 ICT (TH)
TS arrival time (after EQ)	20 min.	30 min.	15-20 min.	2h (SL); 1h (TH)
EWS (local warning issued)	Yes	No	Yes (not enough time)	No
TS max wave height (tide gauges)	7.3 m (Soma, Fukushima)	2.61 m (Valparaíso)	2.5 m (Pago Pago)	SL: 3.87 m (Colombo) TH: 4.70 m (Ta Phao Noi)
TS max inundation depth (surveys)	10-15 m (Sanriku)	2.30 m (Constitución)	Above 5 m	SL: above 10 m (Ampara) TH: 6 m (Ban Thale Nok)
TS max run-up (a.s.l.)	55.88 m (Iwate) 38.56 m (Miyagi),	29 m (Constitución)	14.45 m (Lepa, Upolu Island)	SL: 12.50 m (Yala) TH: 19.60m (Ban Thung Dap)
TS max distance travelled inland	7 900 m (Iwate) 4 951 m (Miyagi),	1 032 m (Playa Purema)	440 m (Salani, Upolu Island)	SL: 500m (Koggala and Kalkudah) TH: 939 m (Hat Praphat)
Fatalities	15 884 (T: 15817)	156	140	SL: 13 391; TH: 5 395
Missing	2 633 (T: 2629)	25	4	SL: 799; TH: N/A
Total casualties	18 517 (T: 18446)	181	144	SL: 14 190; TH: 5395

RESULTS

Age related vulnerability (Samoa: Green line)



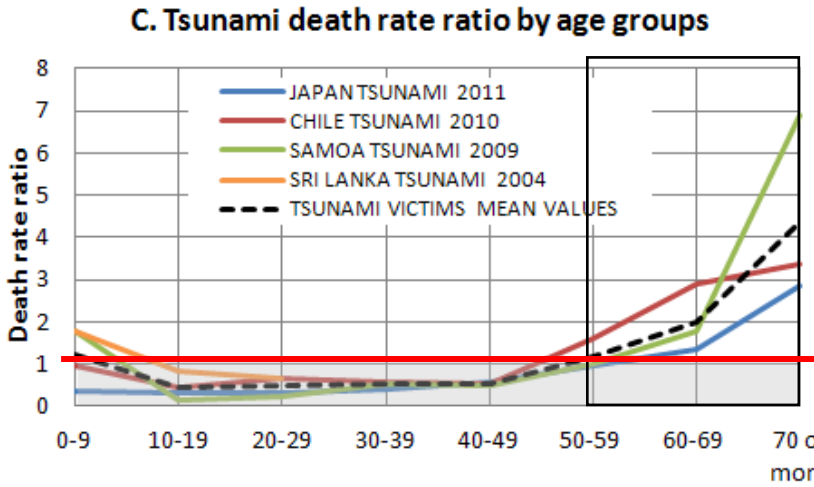


26% of Samoan population is below 9 yr

46% of Samoan victims is below 9 yr

HIGHER MORTALITY OF CHILDREN AND ELDERLY IN SAMOA, 2009

DEATH RATE RATIOS MUCH HIGHER FOR ELDER PEOPLE



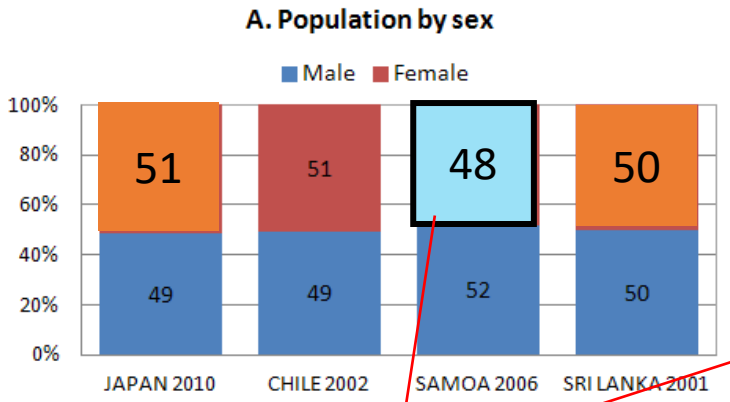
Death rate ratio =B/A

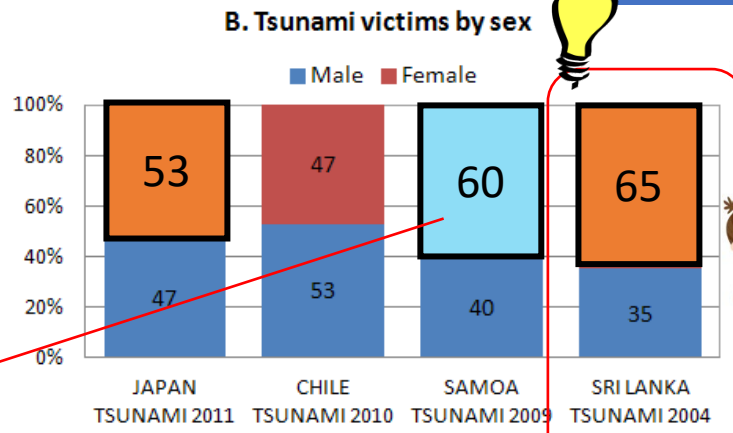
DRR>1 : death is related to **higher vulnerability** and not to pre-event population structure

RESULTS

Gender vulnerability

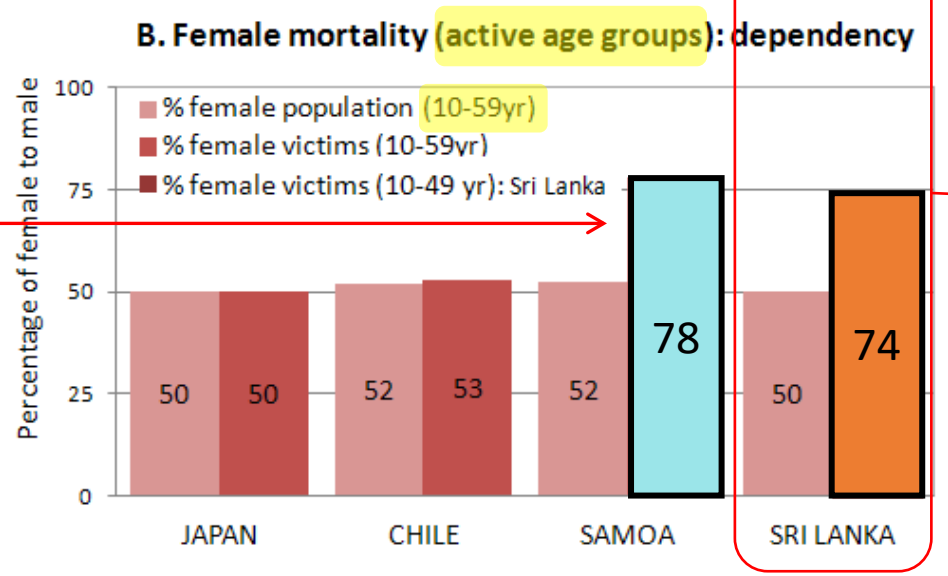
HIGHER FEMALE MORTALITY





RELATED TO DEPENDENCY & GENDER ROLES?

Higher Female mortality in Samoa, 2009



HIGHER FEMALE MORTALITY DUE TO GENDER ROLES: **ONLY** IN SAMOA AND SRI LANKA → **DEPENDS ON COUNTRY'S DEVELOPMENT PROFILE!!**

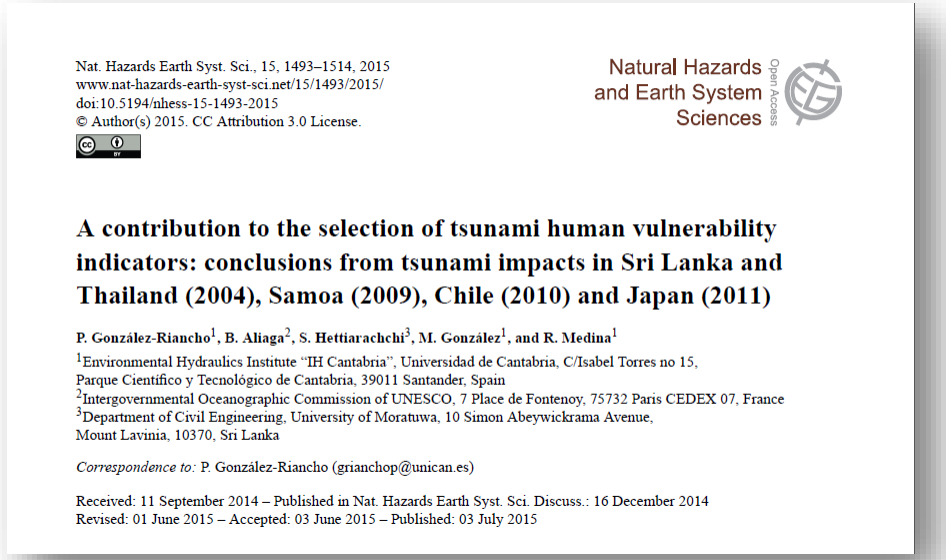
Sri Lankan female victims:

- 65% of total victims
- 74% of victims between 10-49 yr

CONCLUSIONS

VALID FOR SAMOA, 2009 – POSSIBLY FOR SIDS IN GENERAL

- **AGE: children and elderly are the most vulnerable.**
  - Elderly: much higher death rate ratios, compared to the demographics
  - Mortality paterns depend on **population pyramids** (country development profile) and is exacerbated by the vulnerability of elders and childrens
- **GENDER: female mortality not always related to gender roles.**
  - Gender roles identified in developing/undeveloped countries (Samoa, Sri Lanka)
  - Japan female mortality due to female longevity.



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A contribution to the selection of tsunami human vulnerability indicators: conclusions from tsunami impacts in Sri Lanka and Thailand (2004), Samoa (2009), Chile (2010) and Japan (2011)

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TAKE HOME MESSAGE:

FOR SIDS, ELDERS AND CHILDRENS UNDER AGE 9 YEAR, AND WOMEN, ARE IN EXCESS THREATENED BY TSUNAMIS

→ SIDS HUMAN VULNERABILITY INDICATORS FOR (TSUNAMIS) SHOULD INCLUDE AGE AND GENDER CONSIDERATIONS

Standard Operating Procedures (SOP) Planning and Implementation for Tsunami Response

Jointly organized by IOC-UNESCO and EC-JRC

5-6 October 2022, EC-JRC Ispra-Italy

unesco

Intergovernmental Oceanographic Commission

SOP Development – CARIBE EWS experience

B. Aliaga
IOC Tsunami Unit

THANK YOU FOR ATTENTION!

QUESTIONS?
COMMENTS?