Features (16Cs) and strategies (7Ts) for science and risk communication

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The mass media are considered a central channel for communicating the sciences of disaster risk reduction (DRR) to citizens and has a significant collective effect on how individuals and society consider natural hazards science, mitigation, and risk reduction principles. Effective communication that meets citizen needs will be achieved by aligning DRR topic knowledge with citizen information requirements leading to increased engagement in DRR and to support DRR-focussed decision-making. The objective of my research was to identify practical ways in which media, scientists, and policy- and decision-makers could individually and collaboratively improve the content of mass media concerning natural hazards. I undertook an extensive literature review, surveyed and interviewed 493 New Zealand citizens including scientists and other Canterbury-earthquake-related media sources, analysed earthquake-related articles in New Zealand-based on-line print media articles and television broadcasts, as well as women's magazines published before and during the Canterbury earthquakes of 2010 and 2011, and compared the content with a proxy of earthquake-related research generated by analysis of over 4500 academic articles relating to 20 recent earthquakes. The table below represents a synthesis of the literature review as to how scientists and practitioners can better communicate about science and risk for DRR.

16Cs: Key features of well-regarded science and risk communication

7Ts: Strategies

A **CONSIDERATE** communication that is...				And exhibits the **COMPLETE** range of strategy elements:	
		CLEAR	simple and clear core message		Begin, conclude or include options for **Tangible action**
		CAPTIVATING	entertaining, engaging, salient, storied		**Tell the story**
		COMPREHENSIVE	evidence-based, holistic, integrated and remember audiences don't know what they don't know		Make sure it's **Theoretically robust** and **The whole story**
	CONTEXTUALISED	Communicates **COMPLEXITY**	multiple perspectives, facts separated from frames, starting with a clear definition of goals		
		COMPARABLE	provides a standard of comparison		**Touch base** with the audience(s)
		Addresses **CONCERNS**	provides local context and considers audience(s) criticisms, values and information needs		
		Acknowledges **unCERTAINTIES**	is clear about what is certain and what is not; science is provisional knowledge, models have limitations, clarify uncertainty terminology		**Tell it like it is**
		CREDIBLE	transparent, believable		
		COUNTERACTS myths	addresses topics and concerns that, having little evidence-basis doesn't serve society well		
		COMPREHENSIBLE	does not use jargon		**Tell them what they need to know**
		CONCISE	avoids superfluous information		
		CONFIRMABLE	able to be checked – links to other information		
		CONCRETE	advice linked to evidence-based information about solutions, actions and responsibilities		**(Tangible action)** as above

Sixteen key features of 'effective' science- and risk communication beginning with the letter 'C' (16Cs) are shown in the first to third and fifth columns. These key features are applicable to a story of only a few sentences in length, such as a short television interview, a print news story, a book, or an evening of public consultation. Column six includes seven elements beginning with the letter 'T' that together exemplify 'best-practice' to define a strategy (7Ts) for DRR-communication influenced by the 16Cs (after Weingart et al. (2000) and Miller (2008)). The 7Ts also include recommendations for communicating risk from other literature including Amberg and Hall (2010) and Fisher (1999).

Primary source: Bryner, V. (2016) Communicating the Science of Earthquake-related Disaster Risk Reduction: Stories Surrounding the Canterbury Earthquakes, Unpublished PhD Thesis, University of Otago. **Selected Other References:** Amberg, S. M., & Hall, T. E. (2010). Precision and rhetoric in media reporting about contamination in farmed salmon. Science Communication; Fisher, A., 1991, Risk Communication Challenges: Risk Analysis, v. 11, no. 2, p. 173–179; Miller, S. (2008). So where's the theory? On the relationship between science communication practice and research. In Communicating science in social contexts (pp. 275-287). Springer Netherlands; Weingart, P., A. Engels & P. Pasengrau (2000) Risks of Communication: discourses on climate change in science, politics and the mass media Public Understanding of Science, 9, 261-283.