

Disaster Risk and Age Index



**HelpAge
International**

age helps

Contents

HelpAge International helps older people claim their rights, challenge discrimination and overcome poverty, so that they can lead dignified, secure, active and healthy lives. Our work is strengthened through our global network of like-minded organisations – the only one of its kind in the world.

We are grateful to the United Nations Office for Disaster Risk Reduction (UNISDR) for providing financial support for the Disaster Risk and Age Index.

We would also like to thank Tom De Groeve and his INFORM team at the EC Joint Research Centre, Institute for the Protection and Security of the Citizens for their support in the review and development of the index methodology.

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Front cover photo by Robin Wyatt/HelpAge International

Design by TRUE www.truedesign.co.uk
Print by Park www.parkcom.co.uk
Printed on Cocoon, 100% recycled and FSC® certified

Online version www.helpage.org/disaster-index
Online graphics by Hoonio Kim

Disaster Risk and Age Index

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Registered charity no. 288180

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ISBN 1 872590 94 2

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Foreword

It is a sign of the world's resilience that in 2014 approximately 868 million people or nearly 12 per cent of the world's population are over the age of 60. By 2050 – just over a generation away – there will be 2 billion people over 60, nearly as many as children under 15.

Older people are a precious resource with much to contribute by way of life experience and understanding of risk but they are often left out of key decision making in disaster risk reduction. UNISDR has been working with HelpAge International and other partners to ensure that older people are included in disaster risk reduction work and that the post-2015 framework for disaster risk reduction is explicit about their needs and how they can become more involved at community level.

The importance of this is self-evident from the publication you now have in your hands. *Disaster Risk and Age Index* captures the collision of two trends: ageing populations and the acceleration of risk in a world which is increasingly exposed to natural and technological hazards.

This report helps to measure and assess countries' progress in supporting older populations in respect of disaster risk, highlighting gaps in international and national data sets and pointing to appropriate policies. It demonstrates clearly how leaving out older people in approaches to development, including disaster risk management planning, can lead to bad outcomes for them in disasters. Such planning must take into account the vulnerabilities as well as the capacities of the older generation. Otherwise they will be disproportionately affected by disasters, as we have seen happen all too often in high- and low-income countries.

This pilot index provides feedback to countries and policy makers on how they are doing globally, and, of equal importance, the data demonstrates the changes needed to improve the disaster resilience of older people, from education and social pensions to age-inclusive disaster risk management. Proactive initiatives on sex- and age-disaggregated data should be applauded, demonstrating what is possible currently, and also highlighting where we need to build and systematise the collection of sex-, age- and disability-disaggregated data as a priority for disaster risk reduction.

Margareta Wahlström

*Special Representative of the Secretary-General
for Disaster Risk Reduction*



Artemio Andaya/COSE

Executive summary

Older people at risk

The increasing size of the ageing population worldwide represents a triumph of development and improvements in healthcare, but the combination of more extreme climate events and an ageing population may increase older people's vulnerability to disasters, especially in low- and middle-income countries. All too often, disasters result in avoidable and disproportionate loss of life and impoverishment among older people, whose vulnerabilities and capacities are overlooked, even though they have the same rights as other age groups to protection from physical and psychological harm.

When Hurricane Katrina struck New Orleans in 2005, 75 per cent of those who died were aged over 60, even though this age group comprised only 16 per cent of the local population. Similarly, in the Japanese tsunami of 2011, 56 per cent of those who died were aged 65 and over, despite this age group comprising just 23 per cent of the population.

What is the Disaster Risk and Age Index?

The Disaster Risk and Age Index 2015 is a pilot initiative which presents a unique snapshot of the disaster risk faced by older people in 190 countries across the world. It highlights which countries are doing the most to reduce the vulnerabilities and boost the capacities of their older populations in the face of disaster risk.

This pilot index is based on the INFORM 2015 Index, a global, open-source risk assessment for humanitarian crises and disasters, which was developed through a collaboration between the Inter-Agency Standing Committee Task Team for Preparedness and Resilience and the European Commission. INFORM 2015 is composed of:

- a hazard and exposure dimension, which outlines both natural and human hazards in the environment
- a vulnerability dimension comprising development and deprivation data, inequality, aid dependency, uprooted people and vulnerable group data
- a capacity dimension that includes disaster risk reduction (DRR), governance, communication, infrastructure and access to healthcare capacity data.



Glyn Riley/HelpAge International

All three dimensions are equally weighted to determine risk. HelpAge International has augmented this methodology to create a pilot Disaster Risk and Age Index, including additional indicators within the vulnerability and capacity components that reflect more accurately the specific situation and condition of the older population, rather than the population as a whole. For example, within the vulnerability dimension, child mortality rates were removed, while pension coverage and relative old-age poverty were included.

In some of the indicators, data on the 60-plus or 65-plus cohort was disaggregated, such as UNHCR's "People of Concern" which was already age-disaggregated. Other indicators were adjusted to data sets which included age-disaggregated components, but were similar to the original indicators, such as malaria mortality in older age, as opposed to the original prevalence data which was not available age-disaggregated.

Findings

The pilot index shows that the countries where older people are most at risk from disaster are Somalia (1), Central African Republic (2) and Afghanistan (3), due to ongoing conflict and a hazardous environment as well as the lack of services and protection for older people. At the other end of the scale, in São Tomé e Príncipe (188), Finland (189) and Malta (190), older people are exposed to the lowest risk in disasters.

Two countries in the index which demonstrate that efforts are being made to reduce the disaster risks to older people are Japan (133) and USA (142). For both these countries, strong capacity and low vulnerability scores help reduce the risk to older people despite high hazard exposure values. However, while these countries show some progress, events such as Hurricane Katrina and the Japanese tsunami reveal that much more needs to be done on age-inclusive disaster risk reduction (DRR) to prevent the disproportionate impact on older populations.

Ageing and increasing disaster risk

The report identifies countries and regions at highest risk on the index that also show demographic projections of rapid ageing over the coming century. From these findings, it anticipates what the risk in the future may be. The analysis focuses on South and East Asia which demonstrates most visibly both rapid population ageing and increasing disaster risk. In particular, Bangladesh, Cambodia, Myanmar, Vietnam and Thailand all include significant ageing populations with an increasing risk of climate hazard.

Older people can be part of the solution to these potential crises, the report argues. Older people have a lifetime of experience, knowledge and skills that can be useful in understanding local environmental hazards and their impacts and supporting disaster preparedness in their communities.

Introduction

These capacities are often overlooked by governments, donors and non-governmental organisations (NGOs), who are more inclined to see older people as passive recipients of aid than to find ways to use their capacities to make disaster relief activities more effective. HelpAge International further invites government and agencies working in disaster risk reduction to sign up to Charter 14, committing to include older people's needs, capacities and visibility in all aspects of disaster risk reduction.

The report also outlines the methodology used in the index, and its current gaps and limitations.

Recommendations

The report highlights critical policy and practice changes across all aspects of development, including disaster risk management, that are needed to reduce the risks to older populations. Key recommendations are:

- Specifically mention older people in national disaster management and climate policies, requiring direct action in planning, budgeting, training and response.
- Collect sex-, age- and disability-disaggregated data, including for older age groups: 50-59, 60-69, 70-79, and 80+ years, in all disaster management data sets, and analyse this data with regard to the impact of all disaster risk reduction initiatives.
- Make age- and disaster-smart development decisions to create resilient and age-inclusive societies, boosting older population's capacities and reducing their vulnerabilities in the face of disaster risk.
- Include high-level data such as this index in the monitoring mechanism of the new post-2015 Disaster Risk Reduction Framework, accompanied by local-level monitoring mechanisms to ensure the voices and experience of those affected by disasters are heard and acted upon.

The Disaster Risk and Age Index is an important tool to support governments and other disaster management practitioners to understand how to reduce their older populations' vulnerability to disaster and boost their capacity, through improved developmental services such as healthcare, income, infrastructure and disaster management planning and preparedness. It provides a holistic view of disaster management, demonstrating actions that need to take place within society on a day-to-day basis to boost resilience to disasters, as well as specific disaster management and preparedness actions to ensure disaster risk is effectively managed for all of society including the growing older population.

Today, people aged over 60 constitute nearly 12 per cent of the global population.¹ By 2030, this proportion will have reached 16 per cent – that is, 1.4 billion older people. Much of the population ageing will occur in lower-income countries.² This dynamic will develop at the same time as the world's climate changes, increasing climatic risks across the globe and heightening exposure to disaster.³ A report by the United Nations Intergovernmental Panel on Climate Change (IPCC) in 2014 warned that climate change has become a threat to life and livelihoods and is also a factor in the rise of mega-disasters.⁴

The ageing population is to be celebrated, as it represents the triumph of development and improvements in healthcare, but the combination of more extreme climate events and an ageing population has the potential to increase older people's vulnerability to disasters, especially in low- and middle-income countries. All too often, disasters (whether slow or rapid onset) result in avoidable and disproportionate loss of life and impoverishment among older people, whose vulnerabilities and capacities are overlooked, even though they have the same rights as other age groups to protection from physical and psychological harm.

When Hurricane Katrina struck New Orleans in 2005, 75 per cent of those who died were aged over 60, even though this age group comprised only 16 per cent of the local population.⁵ Similarly, in the Japanese tsunami of 2011, 56 per cent of those who died were aged 65 and over, despite this age group comprising just 23 per cent of the population.⁶ Furthermore, humanitarian response systems are ill-equipped to respond to older people's needs. A study carried out by HelpAge International in 2013 found that only 1 per cent of funded projects targeted older people.⁷

Older people at risk in disasters

Four key factors explain older people's heightened vulnerability in the face of shocks:

- Physical decline that comes with ageing, which can include poor health, mobility, sight and hearing
- Lack of adequate service provision, support and information for older people, both on a daily basis and in emergencies
- Age discrimination, which serves to exclude and isolate older people, and often violates their rights
- High poverty levels among older people, often exacerbated by lack of social protection mechanisms and livelihood opportunities. This leaves them vulnerable to disaster – for example by exacerbating their physical decline as they are unable to access services and education, protect their homes and businesses or reduce their exposure, save or access financial services.

Older people's physical and social challenges can reduce their capacity to prepare for disasters – for example, they may struggle to stockpile food and water, bring livestock to safety quickly, or travel long distances. Frail and poor older people who live alone, isolated from family and community support, are more likely to live in poorly constructed houses, which can put them at greater risk. In addition, many frail or housebound older people may be less able or willing to flee their homes (for example, to move to higher ground or

evacuation centres when cyclones or floods threaten), due to connection to land and place. Lack of developmental services, and the absence of resilient service systems that can function in the face of disaster and poverty in old age across the world, often leave older people highly vulnerable to disaster.

Older people's contributions

Older people have a lifetime of experience, knowledge and skills that can be useful in understanding local environmental hazards and their impacts and supporting disaster preparedness in their communities. It is therefore vital to recognise older men and women's capacities, and support them to make contributions to all stages of disaster management activities, from risk assessment to operational response and recovery. Older people can also make other important contributions:

- As community elders and traditional knowledge-holders, they may be a valuable source of information on local hazard and risk profiles, and sustainable community-based mitigation strategies which can be combined with other information sources, such as scientific data to better understand local hazard. For example, older people may recall details about the impact of previous local disasters (and the response effort), highlighting what could be improved. They also have experienced how the community has adapted to climate variability and climate change over time.
- Older people may not be as intensively engaged in day-to-day economic activities as younger people, and so may be able to spend more time on disaster risk reduction activities, while encouraging other community members to get involved. They will also have acquired significant knowledge and skills over their working life which they may wish to contribute.
- Older women in particular can play an important role in supporting family members and grandchildren. In addition to their own protection needs during a crisis, their role as carers of other vulnerable groups also needs to be considered.
- Older people can be strong community champions when it comes to DRR. They generally have the ability to reflect and to benefit from hindsight, and are strongly motivated by wanting to make the world a safer place for their grandchildren.

These capacities are often overlooked by governments, donors and NGOs, who are more inclined to see older people as passive recipients of aid than to find ways to use their capacities to make DRR activities more effective.

Assessing risk for older populations: methodology

With support from United Nations Office for Disaster Risk Reduction (UNISDR), HelpAge has developed the Disaster Risk and Age Index as a pilot. This provides a country-by-country analysis of the disaster risks faced by older people in 190 countries, based on three dimensions: Hazard and exposure, Vulnerability and Lack of coping capacity.

The index is based primarily on the INFORM 2015 Disaster Risk Index developed by the European Commission in collaboration with the Inter-Agency Standing Committee Task Team for Preparedness and Resilience, who also provided a review, guidance and feedback on the Disaster Risk and Age Index methodology.

A developmental approach

The approach of INFORM 2015 and the subsequent Disaster Risk and Age Index is based on a developmental approach to disasters. Disasters arise from the interaction of a natural or human-based hazard with the social, economic and environmental conditions in the society concerned. A disaster is incubated in daily life, where vulnerabilities exist and develop due to poor decision making, lack of resources and resilient services. The consequence of these vulnerabilities becomes evident in the resulting impact of the disaster.

Disaster risk reduction (DRR) should therefore be part of everyday decision-making: from education opportunities, healthcare services and social protection provision to urban planning, alongside effective disaster management preparation.

For the development of the Disaster Risk and Age Index, all the data indicators in INFORM 2015 were analysed to understand how well they reflected the vulnerabilities and capacities of older people. The indicators were then augmented with additional and replacement data which provided a better analysis of older people's situation in regard to disaster risk.

For example, within the vulnerability dimension, child mortality rates were removed, while pension coverage and relative old-age poverty were included. In some of the indicators, data on the 60-plus or 65-plus cohort was disaggregated, such as UNHCR's "People of Concern" which was already age-disaggregated. Other indicators were adjusted to data sets which included age-disaggregated components, but were similar to the original indicators, such as malaria mortality in older age, as opposed to the original prevalence data which was not age-disaggregated. In the hazard and exposure dimensions, the same INFORM 2015 methodology was retained without adjustment due to the lack of disaggregated hazard exposure data. The full methodology can be found in Appendix 1.

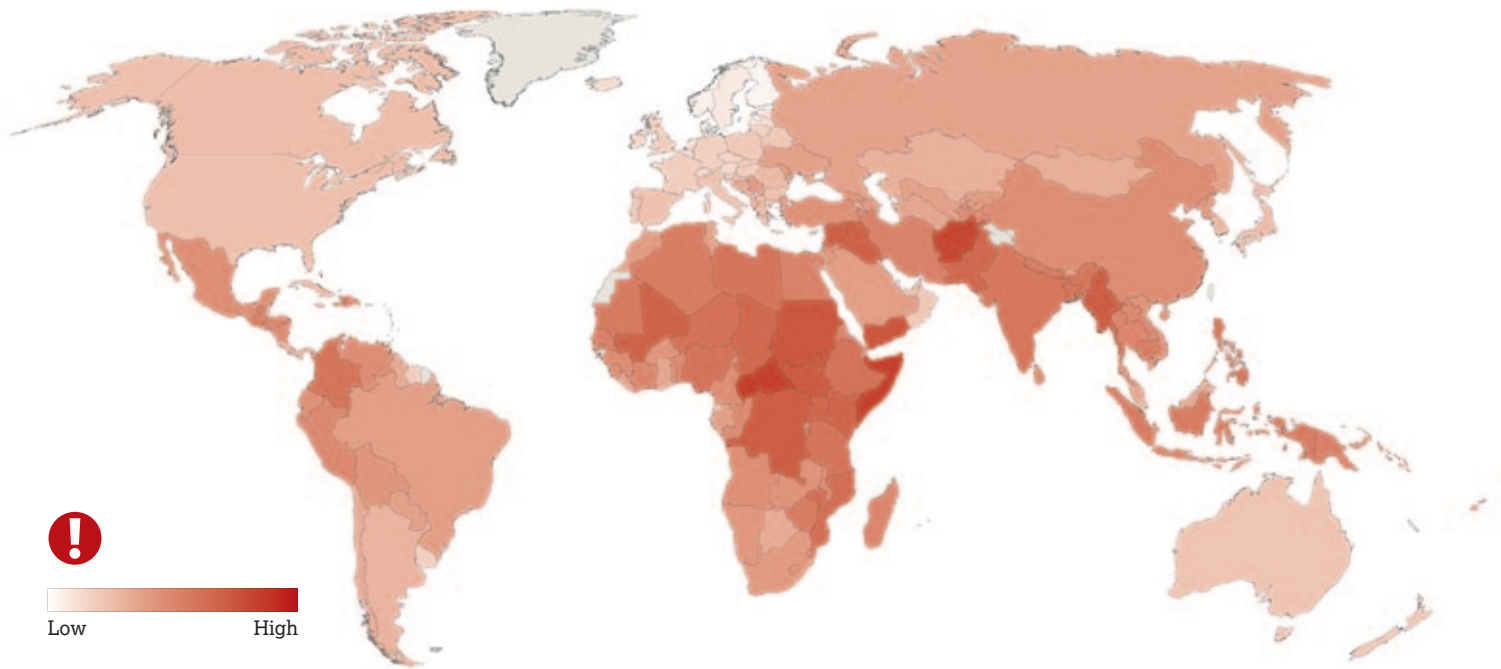
The index demonstrates how older people's day-to-day living conditions can leave them vulnerable and at risk from disasters to which they are exposed. The aim of the Disaster Risk and Age Index is to demonstrate that there are policies and practice that can significantly reduce the risks to older people. Policy makers, from health to social and economic affairs and disaster risk management, all have a role to play in reducing disaster vulnerability and building capacity. The index allows national and international policy makers to analyse their current positions and values and also to facilitate the exchange of good practice and learning on age-responsive disaster risk management.

Disaster Risk and Age Index findings

Table 1: Disaster Risk and Age Index rankings

Rank	Country	Rank	Country	Rank	Country
1	Somalia	65	Cameroon	129	Antigua & Barbuda
2	Central African Republic	66	Fiji	130	Macedonia FYR
3	Afghanistan	67	Turkey	131	Greece
4	Sudan	68	Ecuador	132	Romania
5	Yemen	69	El Salvador	133	Japan
6	South Sudan	70	Vietnam	134	Palau
7	Myanmar	71	Zambia	135	Croatia
8	Congo DR	72	Djibouti	136	Montenegro
9	Syria	73	Georgia	137	United Arab Emirates
10	Iraq	74	Burkina Faso	138	Canada
11	Mali	75	Timor-Leste	139	Israel
12	Kenya	76	Bolivia	140	Grenada
13	Haiti	77	Lesotho	141	Nauru
14	Uganda	78	Lebanon	142	United States of America
15	Chad	79	Guinea-Bissau	143	Spain
16	Pakistan	80	North Korea	144	Trinidad & Tobago
17	Mozambique	81	Namibia	145	Bulgaria
18	Philippines	82	Jordan	146	Italy
19	Niger	83	South Africa	147	New Zealand
20	Nigeria	84	Kyrgyzstan	148	Portugal
21	Ethiopia	85	Moldova	149	Marshall Islands
22	Libya	86	Azerbaijan	150	Australia
23	Burundi	87	Serbia	151	Dominica
24	Colombia	88	Morocco	152	Poland
25	Bangladesh	89	Brazil	153	Oman
26	Tanzania	90	Bhutan	154	Slovakia
27	Palestine	91	Saudi Arabia	155	Belarus
28	India	92	Liberia	156	Equatorial Guinea
29	Mauritania	93	Ukraine	157	Cyprus
30	Nepal	94	Gabon	158	Suriname
31	Algeria	95	Paraguay	159	Hungary
32	Indonesia	96	Uzbekistan	160	Barbados
33	Zimbabwe	97	Tunisia	161	Bahrain
34	Cambodia	98	Russia	162	St Vincent & the Grenadines
35	Guatemala	99	Comoros	163	France
36	Papua New Guinea	100	Gambia	164	United Kingdom
37	Egypt	101	Jamaica	165	Uruguay
38	Senegal	102	Ghana	166	Germany
39	Iran	103	Malaysia	167	Czech Republic
40	Dominican Republic	104	Turkmenistan	168	Bahamas
41	Solomon Islands	105	Panama	169	Lithuania
42	Madagascar	106	Bosnia & Herzegovina	170	Slovenia
43	Côte d'Ivoire	107	Kuwait	171	Tuvalu
44	Thailand	108	Chile	172	Qatar
45	Sri Lanka	109	Guyana	173	Maldives
46	Peru	110	Armenia	174	Ireland
47	Lao PDR	111	Botswana	175	Austria
48	Honduras	112	Albania	176	Switzerland
49	Eritrea	113	Mauritius	177	Latvia
50	Congo	114	Mongolia	178	Belgium
51	Benin	115	Samoa	179	Iceland
52	Nicaragua	116	Belize	180	Brunei Darussalam
53	Vanuatu	117	St Kitts & Nevis	181	Estonia
54	Guinea	118	Kazakhstan	182	Netherlands
55	Rwanda	119	Tonga	183	Denmark
56	China	120	Cape Verde	184	Luxembourg
57	Tajikistan	121	Micronesia	185	Sweden
58	Venezuela	122	Seychelles	186	Norway
59	Togo	123	Costa Rica	187	Singapore
60	Mexico	124	Argentina	188	São Tomé e Príncipe
61	Sierra Leone	125	Cuba	189	Finland
62	Malawi	126	St Lucia	190	Malta
63	Swaziland	127	Kiribati		
64	Angola	128	South Korea		

Figure 1: Global Risk map



Older people in disasters: the highest-risk countries

The Disaster Risk and Age Index shows that the countries where older people are most at risk from disaster are Somalia (1), Central African Republic (2) and Afghanistan (3), due to ongoing conflict and a hazardous environment as well as the lack of services and protection for older people. At the other end of the scale, in São Tomé e Príncipe (188), Finland (189) and Malta (190), older people are exposed to the lowest risk in disaster situations (see Table 1).

The top 10 countries, which also include Sudan, Yemen, South Sudan, Myanmar, Congo DR, Syria and Iraq, all display very similar characteristics, in that all have significant conflict and human hazard scores, which have substantially contributed to their position, along with a lack of services, provision and protection of their older citizens (see Table 2).

However, if the risk score is broken down into its three components, some differences emerge. Those countries with the highest exposure to hazard are Afghanistan, Somalia and Syria, due to a combination of natural hazards alongside serious conflict situations. Countries with the lowest hazard and exposure scores are reflective of the overall risk score in the case of Malta, Finland and São Tomé e Príncipe.

On the older person vulnerability component alone, Central African Republic, Afghanistan and Congo DR show older populations most vulnerable to disaster and Norway, Sweden and the Netherlands, the least (see Figure 3).

For lack of coping capacity, Somalia, Guinea Bissau and Chad doing the least to boost the capacity of their older citizens in response to disaster risk and Denmark, Norway and Finland, the most (see Figure 4). A full list of all dimensions results can be found in Table 7 in Appendix 2.

Table 2: Disaster Risk and Age Index top ten countries

Rank	Country	Overall risk	Hazard and exposure	Vulnerability	Lack of coping capacity
1	Somalia	8.3	8.6	7.0	9.5
2	Central African Republic	8.3	7.8	8.3	8.7
3	Afghanistan	8.0	8.7	7.3	8.2
4	Sudan	7.3	7.3	7.0	7.7
5	Yemen	7.3	7.9	5.7	8.4
6	South Sudan	7.1	7.0	5.8	9.0
7	Myanmar	7.0	8.2	5.9	7.2
8	Congo DR	7.0	5.4	7.3	8.5
9	Syria	6.9	8.4	6.8	5.7
10	Iraq	6.8	8.2	5.5	6.8

Figure 2: Hazard and exposure map

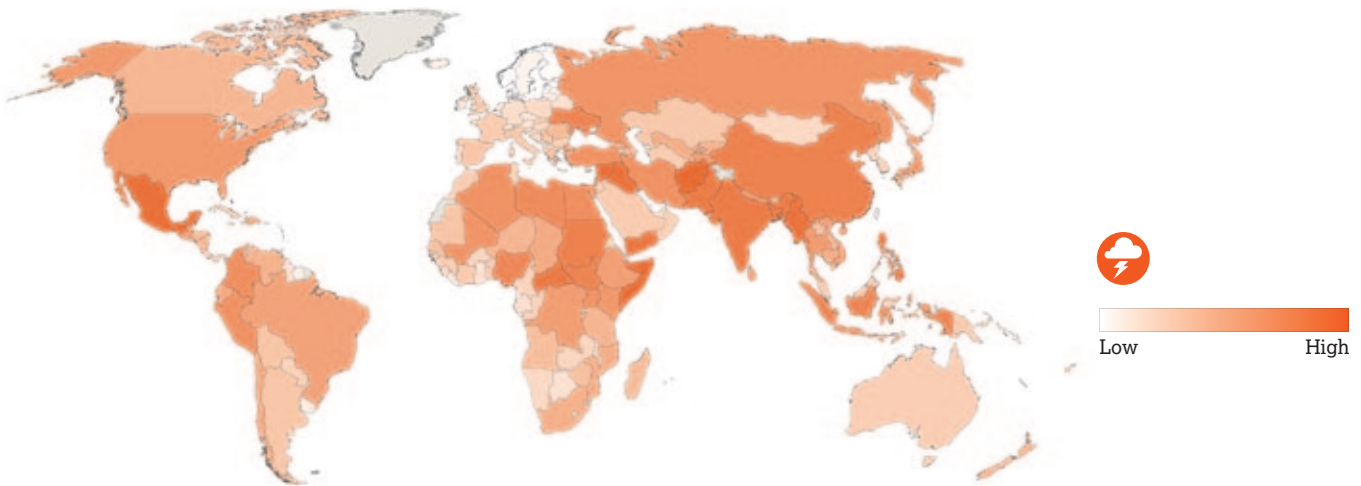


Figure 3: Vulnerability and age map

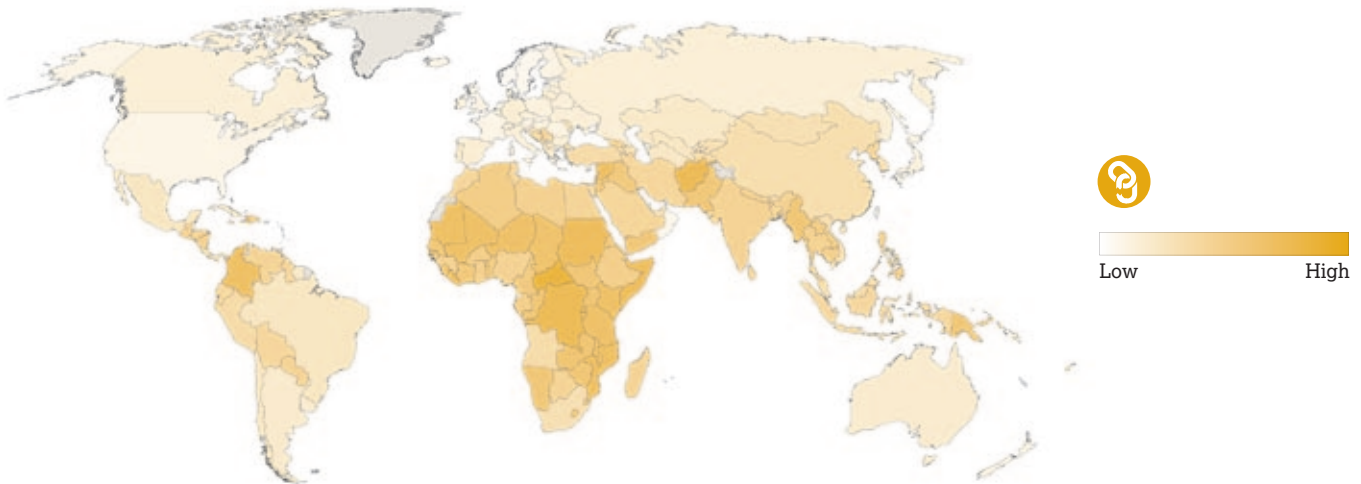
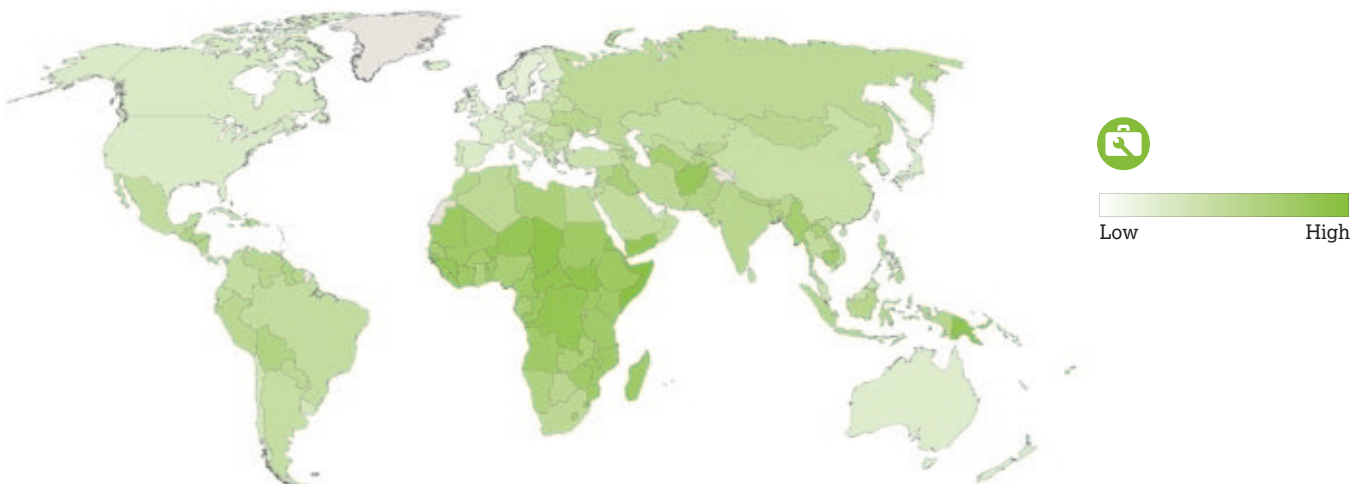


Figure 4: Lack of coping capacity and age map



Examples of high-risk countries

The following examples from the top 10 of the index demonstrate very different environments and situations for the older population, but have resulted in a significant disaster risk for them.

Central African Republic (ranked 2)

Hazard and exposure: overall score 7.8

The natural hazard component only scores 1.1 (due mainly to flooding) whereas the human conflict hazard component scores 10, the maximum value.

Vulnerability: overall score 8.3

Significant deficiencies in age-specific indicators are due to:

- high gender inequality (older men have better access to labour markets and higher educational standards)
- extremely high mortality rates from diseases such as tuberculosis, malaria, HIV and diarrhoeal diseases
- very little healthcare support with only 0.5 doctors per 10,000
- extremely low scores in the age-adjusted Human Development Index (HDI) indicators
- no pensions for older people
- very high numbers of older “People of Concern” to UNHCR.

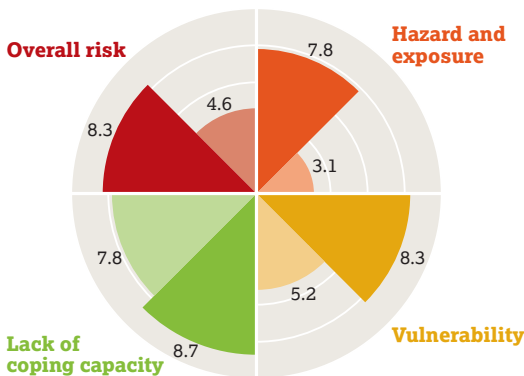
Lack of coping capacity: overall score 8.7

This is due mainly to the following factors:

- only 21 per cent have access to improved water and sanitation
- poor governance scores
- high older adult illiteracy rates
- failure to report against progress on all Hyogo Framework for Action priorities.

The result is the profile of a country whose older citizens on a daily basis struggle to survive with very little support and services and a complete lack of attention to managing disaster risks by the authorities, resulting in a significant catastrophe.

Figure 5: Central African Republic dimensions of disaster risk and old age



Country domain value
Regional average

Sudan (ranked 4)

Hazard and exposure: overall score 7.3

The natural hazard component only scores 4.2 (due to drought and floods) whereas the human conflict hazard component scores 9. Note that the potential conflict score (included within the overall conflict score) is 10, which is greater than the current situational score, so Sudan shows a high potential for conflict increase.

Vulnerability: overall score 7.0

Significant deficiencies in age-specific indicators are due to:

- very few years, if any, in education
- relatively low life expectancy at 60
- higher rates of access to labour markets for older men (68 per cent) compared to women (10 per cent)
- only three doctors per 10,000 people and poor healthcare provision for older people
- high mortality for diarrhoeal diseases
- high numbers of older “People of Concern” to UNHCR, due to the ongoing displacement of populations due to conflict.

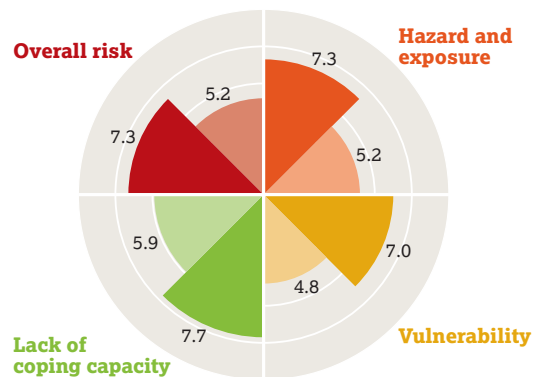
Lack of coping capacity: overall score 7.7

This is due mainly to the following factors:

- high older adult illiteracy rate
- one of the highest scores for poor infrastructure.

This picture highlights an older population highly vulnerable to disaster, but also reflects the situation of all age groups.

Figure 6: Sudan dimensions of disaster risk and old age



Country domain value
Regional average

Myanmar (ranked 7)

Hazard and exposure: overall score 8.2

Myanmar has a significantly high natural hazard component of 9.1 (due to the potential for flood, tropical storms, tsunami and earthquakes), and a value of 7 for potential human conflict hazards.

Vulnerability: overall score 5.9

This relatively low score is mainly due to the absence of aid dependency and few natural shocks in recent years. Significant deficiencies in age-specific indicators are due to:

- low life expectancy at 60
- gender gap in access to labour markets between older men and women
- very low number of years of education for older people
- high numbers of older people are “People of Concern” to UNHCR due to displacement in Myanmar.

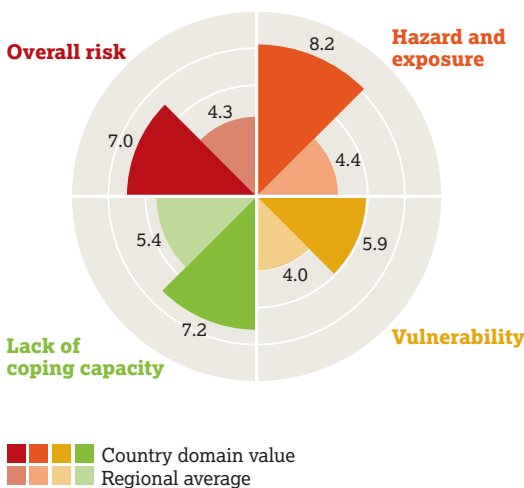
Lack of coping capacity: overall score 7.2

Major deficiencies in coping capacities are due to:

- low level of access for older people to mobile phones and internet
- below average progress on the Hyogo Framework for Action priorities.

Overall, Myanmar has a very similar score for older people to that for the majority of the population in the original INFORM 2015. Its vulnerability score is relatively high, but its lack of capacity along with its hazard profile score pushes it into the top 10 of the Disaster Risk and Age Index.

Figure 7: Myanmar dimensions of disaster risk and old age



Countries with low vulnerability and lack of coping capacity

The Disaster Risk and Age Index also identifies countries which, despite being highly exposed to hazards, show relatively low risk for older people. Two key examples are Japan and USA where, despite the challenges, progress had been made to protect their older citizens.

Japan (ranked 133)

Table 3: Scores for Japan

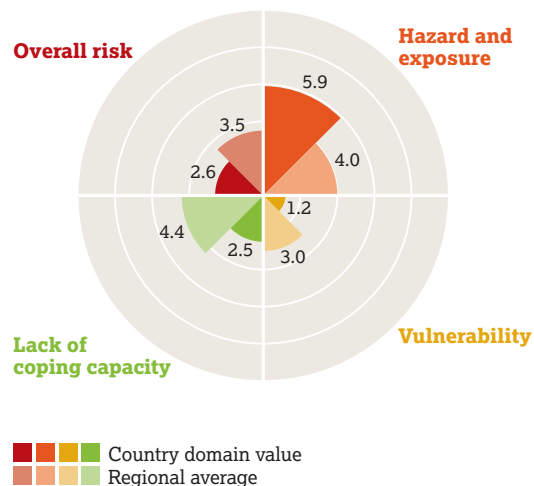
Rank	Country	Overall risk	Hazard and exposure	Vulnerability	Lack of coping capacity
133	Japan	2.6	5.9	1.2	2.5

Japan, being one of the most naturally hazardous places to live, scores the maximum across the geological hazard components, due to its significant earthquake, tsunami and storm exposure. However, it scores very low on the human hazard components, and does not feature near the top of the Disaster Risk and Age Index for a number of reasons (see Table 3).

Japan’s relatively low position compared with its hazard profile is due to many factors. However, most important for older people in Japan are:





- very high life expectancy at older ages
- high health spend per capita
- high number of schooling years and relative gender equality
- overall, a high gross national income per capita
- 98 per cent pension coverage (19 per cent of older people live below the poverty line)
- older people are also very well connected, with 81 per cent using a mobile phone and 60 per cent with internet access
- 100 per cent of the population also has access to improved water and sanitation
- strong government effectiveness
- one of the highest scores on progress against the Hyogo Framework for Action priorities on disaster management.

Figure 8: Japan dimensions of disaster risk and old age



USA (ranked 142)

Table 4: Scores for USA

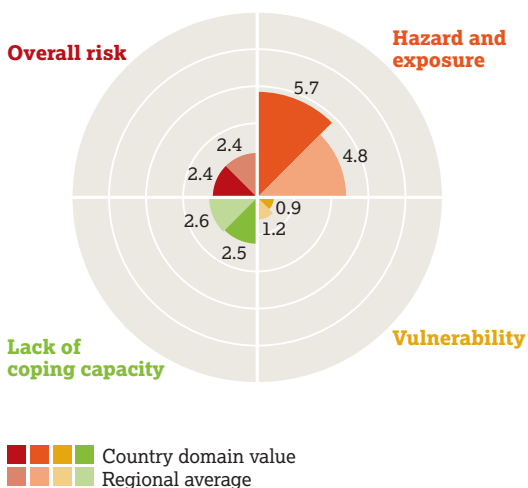
142	USA	2.4	5.7	0.9	2.5
Rank	Country	 Overall risk	 Hazard and exposure	 Vulnerability	 Lack of coping capacity

Like Japan, the USA is subject to a range of natural hazards and is highly exposed, with an overall natural hazard score of 7.6, and similarly with a low human hazard component (see Table 4). Again like Japan, older people benefit from:

- high life expectancy
- high number of years in education and relative gender equality, though older men still have better access to labour markets
- 93 per cent pension coverage, though 14 per cent of older people live below the poverty line
- a large amount spent on healthcare
- low mortality from diarrhoeal diseases
- very low mortality numbers for HIV, malaria and tuberculosis
- very high access to mobile phones (93 per cent) and access to internet (83 per cent)
- good progress by the USA on the Hyogo Framework for Action.

The Disaster Risk and Age Index scores for USA are comparable to the INFORM 2015 scores. This means that provision for older people is equal to that of the rest of the population, indicating a relatively age-inclusive society.

Figure 9: USA dimensions of disaster risk and old age



Limitations of the Disaster Risk and Age Index

While the index shows that older people in the USA and Japan should be relatively well supported in disasters, the cases of Hurricane Katrina in 2005 and the Japanese tsunami in 2011 show very different outcomes compared to the results of the index. These disasters still had a disproportionate impact on older people, with higher death rates as compared to their overall proportion in the population.

While an index such as this provides a very good guide to the overall risk of older people to disasters, it currently lacks the sensitivity and data quality to understand the nuances of risk. More understanding of how age-inclusive national disaster management planning and the impact of past disasters on older people can make a difference, and availability of better data on inequality and the socio-economic status of older people, would provide a much better picture of the realities of risk.

However, as such improvements in data take time, money and coordination, so other methods are needed, especially in the case of the monitoring framework of the Post-2015 Framework for Disaster Risk Reduction. A local-level monitoring mechanism to accompany high-level data collection methods such as the Disaster Risk and Age Index is needed to ensure that the data and risk levels identified reflect the realities of disasters.

The local-level monitoring mechanism should provide a voice for those affected by disasters, including older people. It seeks to understand the impacts of disaster across demographics and to identify the root causes of those impacts within society. By combining high-level data indicators and analysis such as the Disaster Risk and Age Index with local-level monitoring information, real evidence-based solutions to reducing disaster risk can be found for all in society.

Disaster risk and the ageing world

Figure 10: Proportion of population aged 60 or over in 2014 and 2050

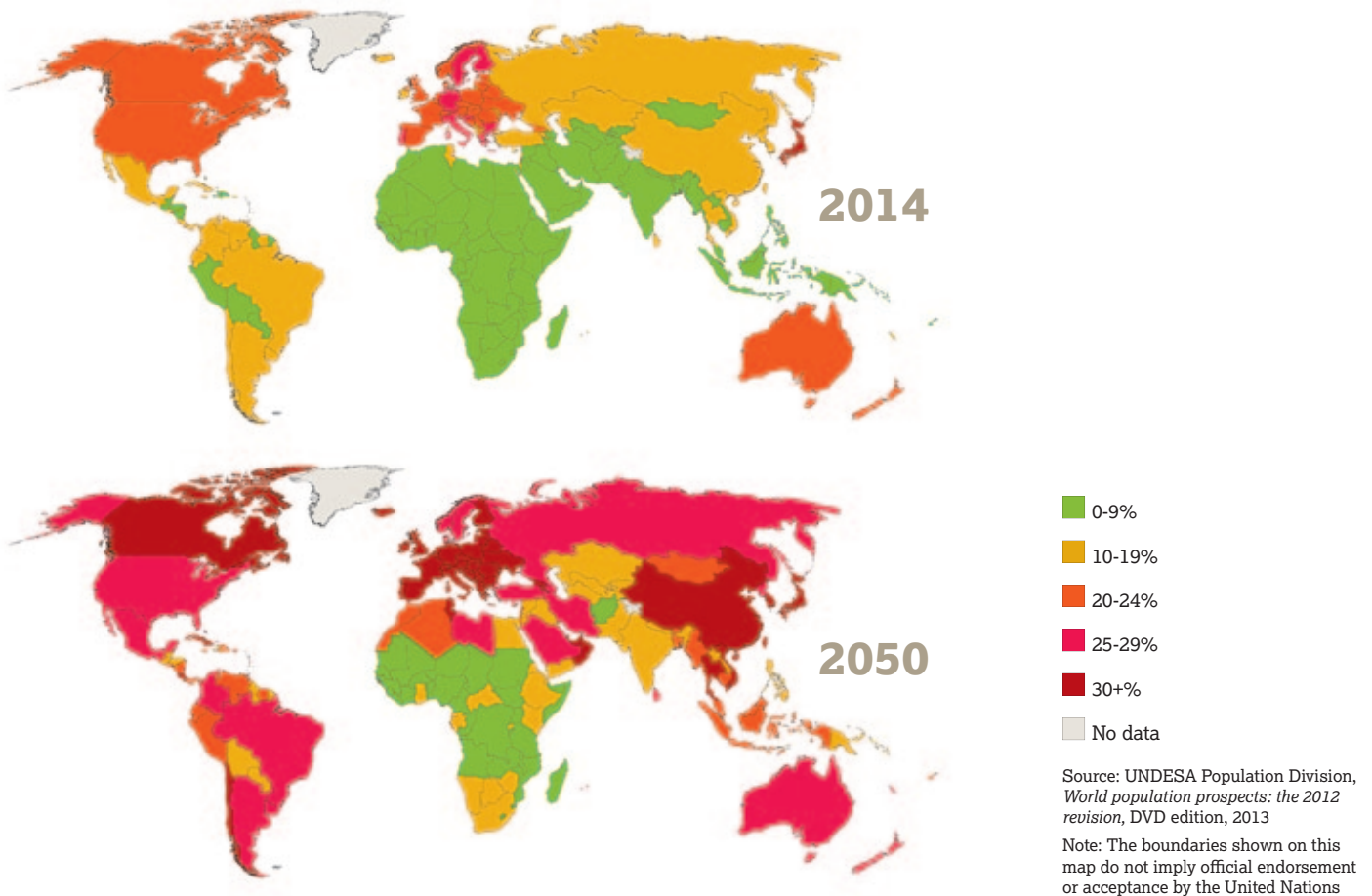
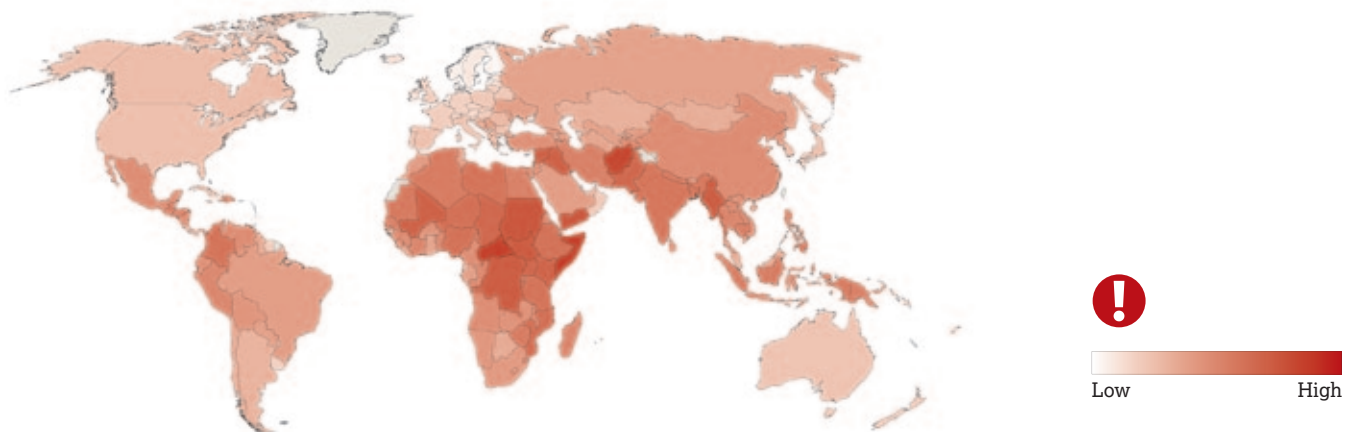


Figure 11: Global Risk map



During this century, the world's population will continue to grow older. At the same time, disaster and hazard exposure is likely to increase with climate change and changing environmental conditions. Pressures on resources are also likely to exacerbate conflict situations.

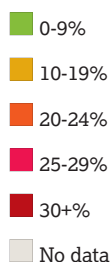
We can identify from the global ageing maps a number of countries which will experience this ageing trend most acutely (see Figure 10). The Disaster Risk and Age Index map shows us those countries which currently have the most older people at risk in disasters (see Figure 11). This implies that in countries featuring high in the Disaster Risk and Age Index and experiencing the most rapid population ageing,

without action to address the risks to older people, increasing proportions of the ageing population will be significantly impacted by disasters.

Countries such as Colombia, India, Indonesia, Libya, Myanmar, Nepal and Pakistan all rank near the top of the Disaster Risk and Age Index and will all experience significant and rapid ageing of their populations. This correlation indicates that age-inclusive disaster risk management, and support to their older populations through services to reduce their vulnerability and increase their capacity, should be a major priority for countries such as these. South and East Asia are expected to experience this collision of ageing and increasing disaster exposure most acutely.

Focus on Asia: increasing disaster exposure and rapid ageing

Figure 12: Proportion of population aged 60 or over in 2014 and 2050 (Asia)



Source: UNDESA Population Division, *World population prospects: the 2012 revision*, DVD edition, 2013

Note: The boundaries shown on this map do not imply official endorsement or acceptance by the United Nations

During the twentieth century, population ageing remained largely a phenomenon affecting high-income countries. It is now emerging as a serious issue in lower-income countries, with the older population (aged 60 years and over), projected to increase at unprecedented rates during the next 50 years (see Figure 12). In both East Asia and South-East Asia, the “oldest old” population will increase at high rates during 2000-2050, and the region will account for half the increase in the world’s “oldest old” population.

Countries in Asia with the lowest proportions of older people (Cambodia, Mongolia, Philippines and Timor-Leste) are projected to have the highest rates of increase in their older populations during 2000-2050. Countries which currently have a low percentage of older people should therefore not ignore the issue of population ageing.⁸

This region will not only face the most rapid population ageing over the coming century but, as the Disaster Risk and Age Index shows, it also currently includes some of the most vulnerable places to be old and exposed to disaster.

The Global Climate Vulnerability Monitor produced by Dara in 2012⁹ indicates a number of countries in this region which will face some of the highest levels of vulnerability to climate change to 2030. Bangladesh, Cambodia, Myanmar, Thailand and Vietnam all include significant ageing populations in regions with an increasingly risky climate (see Table 5).

Table 5: Ageing and climate risk

Country	2010 proportion of people aged 60+ (UNDESA)	2030 proportion of people aged 60+ (UNDESA)	Percentage increase in the proportion of older people	Climate Vulnerability Monitor maximum score (DARA)
Vietnam	7.07	18.3	61.4	High
Thailand	11.27	27.0	58.2	High
Cambodia	6.16	12.8	51.8	High
Myanmar	6.97	14.1	50.5	High
Bangladesh	6.03	11.7	48.6	High

The following case studies include stories of disasters and their impact on older people, highlighting the urgent need for age-inclusive DRR in the region. They also include stories of progress and good practice.

Typhoon Haiyan: disproportionate impact

On 8 November 2013, Typhoon Haiyan struck the Philippines. Only a small proportion of the estimated 6,200 fatalities were recorded. Data from the Philippine Government’s National Disaster Risk Reduction and Management Council suggests that older people were disproportionately affected: 151 of the 393 fatalities whose ages were recorded were over 60 years (38.4 per cent), even though older people comprise just 7 per cent of the population.¹⁰

Nanay Rebecca Rita, 62, Natubgan, Kananga

“During Haiyan, I had heart and liver problems. I was bedridden and could not leave the house.

When the typhoon destroyed my home, my children asked the neighbours to help carry me out. I was brought safely, but painfully, to my sister-in-law’s house.

Before Haiyan, I had a small canteen and rented rice fields to farm. My husband did the farming. After the typhoon, my husband left. Everything was destroyed. Before Haiyan, I consulted a doctor and was given a prescription for medication. I am supposed to take it every day, but I can’t afford it now.”

Carolyn Canham/HelpAge International



Many older people lost relatives, shelter and livelihoods, leaving them displaced and traumatised. Many had to deal with existing vulnerabilities such as non-communicable diseases associated with poverty and poor nutrition. Poor access to information compromised their ability to receive help. For example, 75 per cent of older people interviewed in a post-disaster survey did not know that medical services were available free of charge. About 65 per cent of older people were working pre-Haiyan, but many were not included in post-Haiyan cash-for-work programmes.¹¹

A further survey found that 27 per cent of older people received no shelter assistance and 66 per cent, insufficient shelter assistance. Single women aged 80 or over were the most often excluded, with 38 per cent (nine of the 24 single women aged 80 or over surveyed) receiving no shelter assistance. For 22 per cent of older people, food aid did not meet their needs, for example, those living with non-communicable diseases requiring low-sugar and low-salt diets. Older women (28 per cent) and older men (26 per cent) said they became ill following the disaster, and 27 per cent of older people could not afford medicine, while 15 per cent could not afford doctor’s consultations.¹²

Myanmar: inclusive village disaster management committees

Village disaster management committees are community-based organisations managed by a group of community members, including representatives of vulnerable groups including older people. Their role is to promote disaster preparedness at the village level. The focus on inclusion ensures that older people, female-headed households, pregnant women, children, people with disabilities, and any other vulnerable groups play an active role in identifying hazards, developing disaster action plans, and voicing their needs.

Their capacity has already been tested. In May 2013, when cyclone Mahasen was approaching the Myanmar coast, the early warning task force of the village disaster management committee in Kyu Taw village listened to the radio and kept close phone contact with village authorities to get updated information. They informed villagers every hour by loudspeaker and used red flags to show the level of risk. Luckily, the cyclone did not make landfall in Myanmar, but the committee was prepared and the older people felt ready and supported.

In Ka Nyin Kwin village, early in 2014, in preparation for the upcoming rainy season, the VDMC mobilised villagers to widen the village’s main road in case of evacuation. Some villagers agreed to donate their land on the roadside, and all of them participated in the roadworks and cutting nearby trees.¹³

Pakistan: strength of older people’s associations

Floods are a frequent occurrence in many parts of Pakistan. In 2012, Jacobabad district in Sindh province was completely submerged by flooding, which killed more than 50 people and destroyed houses and crops. As part of a disaster risk reduction programme, a community drill was organised by older people’s associations in the villages of Havaldar Baroi and Mud Khoso before the floods hit. Older people were equipped with stockpiled materials including digging equipment, and first aid and search and rescue items.

Just before the floods, the communities noticed that the colour of the river was changing, and contacted the district disaster management authorities to inform them of this traditional early warning sign. The authorities confirmed that floods were to be expected, and the older people’s associations mobilised the community to block the canals to their villages and divert some of the water using the digging materials they had been given. Many floods in Pakistan are caused or exacerbated by soil erosion on river banks. Because of their actions, 50 per cent less water reached their villages when the flooding happened in comparison to previous floods.

Charter 14 for older people in disaster risk reduction

Charter 14 for older people in disaster risk reduction was developed as part of celebrations for the UN International Day for DRR in 2014 by HelpAge International and UNISDR. The aim of the charter is to encourage governments, NGOs and civil society organisations to pledge to include older people much more effectively in disaster risk reduction efforts, from community to national level. The Charter content was developed in consultation with HelpAge staff, experts in DRR and ageing, older people, and global ageing and disaster management experts.

Charter principles

The Charter emphasises that signatories will address three principles. The first is that older people are **in need** in disaster risk reduction due to their age and potential for significant vulnerability in times of crisis and disaster. The second relates to the **invisibility** of older people, who are often hidden due to lack of data and exclusion. The third principle is that older people are **invaluable**, which highlights their great potential to contribute to disaster risk reduction, through their knowledge, skills and experience.

The Charter then articulates 14 related targets to achieve these principles. These range from targets which are relatively easy wins and are solely within disaster management ministries' influence. At the next level, the targets are more challenging and require more commitment and planning. Finally the highest level targets require much greater integration within development planning and the private sector. In a staged approach, signatories are required to commit and sign up to just one of the targets to begin with.

National governments as well as provincial and local level authorities can sign up, as can national offices of international NGOs. The Charter's primary aim is to stimulate action, mobilisation and commitment around older people's inclusion on a national and local level. However international signatories are also invited to participate.

Asian governments show leadership

Many governments across Asia including Bhutan, Lao PDR, Thailand and Vietnam have taken leadership on this issue by signing up to Charter 14, committing to support older people's inclusion in disaster risk reduction in their countries.

Charter 14 for older people in disaster risk reduction

- Older people are specifically mentioned in national disaster management and climate policies, requiring direct action in planning, budgeting and training.
- Older people have been consulted in the development of national and local disaster and climate risk assessment, and their vulnerabilities and capacities included.
- Early warning signals and information are available, accessible, understandable and actionable by older people.
- Evacuation plans at community level have specific actions to ensure older people can evacuate and are protected during these operations, including actions specific to mobility, sight, hearing and mental impairments and isolation.
- Disaster supplies and stockpiles include specialist items, medication and food required by older people and are accessible to older people in emergency distributions.
- Evacuation and rest centres are age responsive, with off-floor seating, wheelchair accessible facilities, handrails and privacy for men and women.
- Sex-, age- and disability-disaggregated data is collected, including for the following older age groups: 50-59, 60-69, 70-79, and 80-plus years in all disaster management data, and is analysed with regard to the impact of all disaster risk reduction initiatives.
- Emergency personnel in health, search and rescue, management, coordination and protection and livelihoods have been trained in working with older people and addressing their specific needs and strengths in emergencies.
- Older people's knowledge, skills and contributions to disaster risk management are publicly acknowledged and their active involvement promoted.
- Older people have access to cash transfers and livelihood recovery initiatives following disasters.
- Resilient and climate-smart livelihood initiatives are inclusive of people who continue to work into old age.
- Older people are represented in DRR management and governance from the community to the national level to ensure that their voice is heard.
- Social protection systems such as pensions are available and can be accessed within days of a disaster and utilised as emergency cash transfer mechanisms.
- Older people have access to affordable disaster insurance and risk-transfer mechanisms.

Acting on the disaster risk posed to older people

Disasters are not natural events; they are the interaction of a natural or human-based hazard with a society. How that interaction may play out into a disaster is based on the social, economic and environmental conditions which exist within that society, before the event itself. Therefore, action to reduce disaster risk must happen on a day-to-day basis, both in specific disaster risk reduction and management initiatives, and also with disaster resilience being at the forefront of all development decision making. Ensuring those decisions and actions also protect the rights of older people and is also critical to the long-term successful management of disaster risk.

To address the situation highlighted in the Disaster Risk and Age Index, countries must recognise the inevitability of population ageing and the need to adequately prepare all stakeholders (governments, civil society, private sector, communities and families) for the growing numbers of older people and the risks they will be subject too. This should be done by enhancing understanding, strengthening national and local capacities, and developing the political, economic and social reforms needed to adapt societies to an ageing and more risky world.

These actions should be based on a long-term vision, and supported by a strong political commitment and a secured budget that mitigates the negative impacts of disasters. Inclusion of ageing and the needs of older people in all national development policies and programmes must be prioritised, including disaster risk reduction and climate adaptation. Equally, the international humanitarian sector must ensure that its responses are age inclusive and meet the needs of older people.

The index has also demonstrated that conflict plays a significant role in increasing the risk to older people but also the population as a whole. In response to this conflict, responsive disaster risk reduction efforts must be made.

Disaster risk reduction: Action must be taken to make progress on the Hyogo Framework for Action and the priorities of the new post-2015 disaster management framework, and these must be age inclusive and take account of conflict. Action should be taken to achieve the 14 targets of Charter 14 for older people in DRR. Robust monitoring of the new framework should ensure that high-level data such as sex- and age-disaggregated indexes are utilised but this must be done alongside local monitoring mechanisms to cross reference data to reality.

Everyone, including the most vulnerable such as older people, should be given the opportunity to voice their needs, capacity and experience of disaster and for this to be recognised, recorded and utilised to develop risk reduction actions. Only through this culture of learning, inclusivity and risk reduction action can we create a safer world for all.

The following developmental action should also consider ageing and disaster resilience:

A rights-based approach: Key to responding to the index will be support to enhance older people's voice in society, build their capacity and reduce their vulnerability, and also to ensure that their rights to equity in economic, educational and technological opportunities are fulfilled. Investment and good governance are required to ensure services for older people and others at risk in society. This requires working

towards the development of international human rights instruments and their translation into national laws and regulations and affirmative measures that challenge age discrimination and recognise older people as autonomous subjects.

Income and social protection: Among the most urgent concerns of older people worldwide is income security, which is a significant factor in the vulnerability indicators of the Disaster Risk and Age Index. These issues are also among the greatest challenges for governments faced with ageing populations. Investment in pension systems is one of the most important ways to ensure economic independence and reduce poverty in old age. Incomes should be both universal and adequate to ensure economic equality and wellbeing for the older population. Equally, older people should have the opportunity to work and be offered the same opportunities as others in society.

Health and nutrition: The enjoyment of the highest attainable standard of physical and mental health is a right for all throughout the life course, into old age. Improved and age-inclusive health and care systems, with staff equipped to provide appropriate services for ageing populations, will lead to increased life expectancy in old age and more years of healthy life expectancy in later life.

Health and social care services should work together with a focus on maintaining independence, aiming to mitigate the impacts of disease and disability and, where appropriate, provide treatment. Older people need to be included in all actions addressing both infectious diseases (such as tuberculosis, malaria and diarrhoeal diseases) and non-communicable diseases (NCDs). Food security and nutrition appropriate for people in later life should also be ensured to boost overall health and wellbeing.

Infrastructure: An age-friendly physical environment that promotes the development and use of innovative technologies to encourage active ageing is especially important as people grow older and experience reduced mobility and visual and hearing impairments. Affordable and disaster-resilient housing and easily accessible transportation that encourage ageing "in place" are essential to maintain independence, facilitate social contacts and permit older people to remain active members of society. Efforts to support older people's connectivity through technology and the introduction or retro-fitting of "universal resilient design" into infrastructure is essential as the world ages, urbanises and becomes more exposed to disasters.¹⁴

Data: Lack of data on the situation of older people – before, during and after a disaster – is a major barrier to gathering reliable evidence and taking action. Major efforts must be made to collect and provide much higher levels of age-, sex- and disability-disaggregated data, not only in the hazard and disaster statistics but across development data sets to better understand older people's risks and to take appropriate action to reduce them.

Reporting on the new post-2015 Disaster Risk Reduction framework must ensure that sex- and age-disaggregated data is a requirement on all disaster loss data produced. Equally government reporting progress initiatives such as the enhancement of early warning systems or new policy and planning should be required to demonstrate how this is inclusive of the most vulnerable such as older people.

Appendix 1: Methodology

The methodology used to develop the Disaster Risk and Age Index methodology is based primarily on the INFORM 2015 Disaster Risk Index developed by the European Commission in collaboration with the Inter-Agency Standing Committee Task Team for Preparedness and Resilience.

INFORM 2015 methodology

The INFORM 2015 index balances two major forces: hazard and exposure, and vulnerability and lack of coping capacity. Hazard-dependent factors are covered in the Hazard and exposure dimensions, while hazard-independent factors are divided into natural and human hazards: the Vulnerability dimensions, which considers the strength of the individuals and households relative to a disaster, and the Lack of coping capacity dimensions, which considers factors of institutional strength (see Figure 14).

Figure 13: Balancing dimensions



The calculation and definition of risk encompassing these components is determined by the following equation:

$$\text{Risk} = \text{Hazard \& exposure } 1/3 \times \text{Vulnerability } 1/3 \times \text{Lack of coping capacity } 1/3 \text{ (see Figure 13).}$$

INFORM 2015, to determine disaster risk within the Vulnerability and Lack of coping capacity dimensions, has selected currently available developmental data which provides the strongest proxies for disaster vulnerability and lack of coping capacity within society. Figure 14 outlines the components selected under the three dimensions.

The selection of the specific indicators within the different components was based on the following criteria:

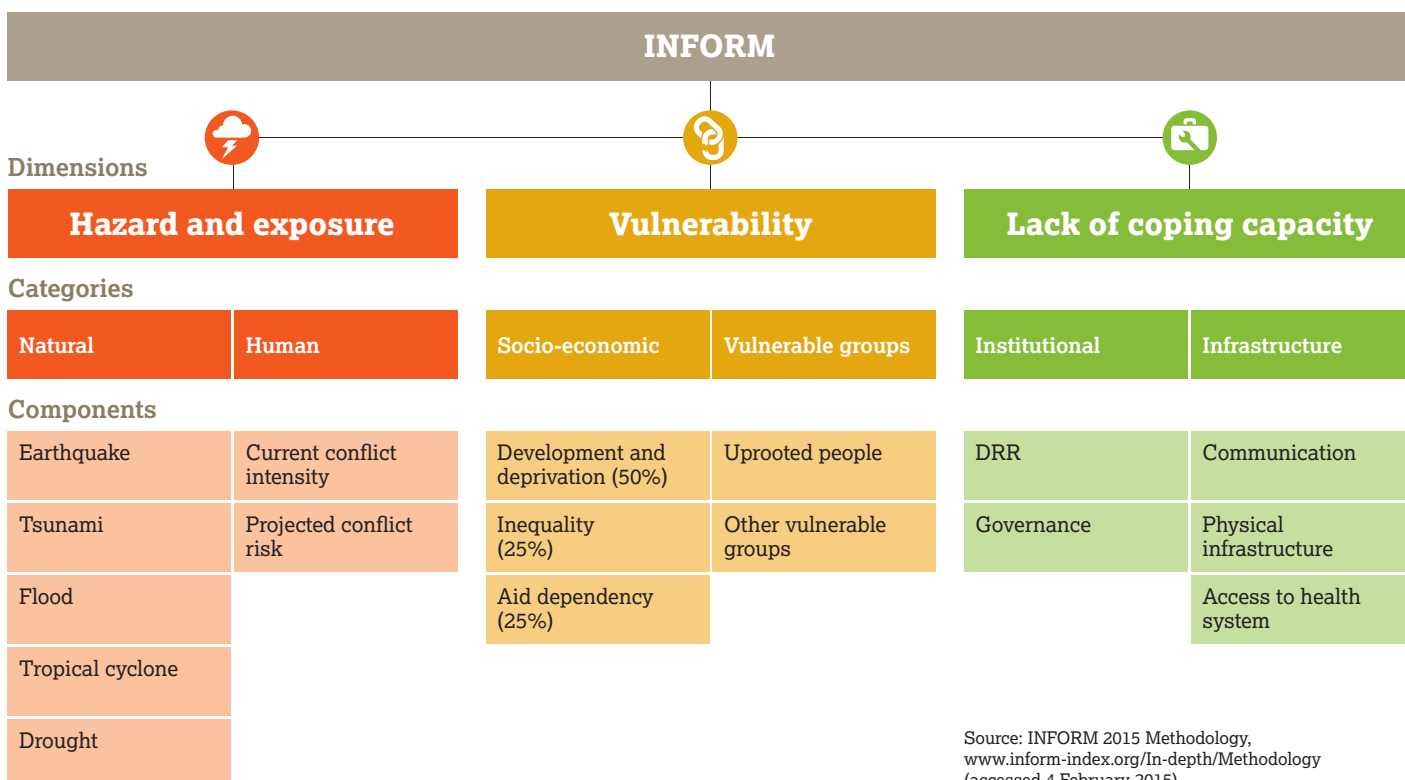
- relevant: justification based on the existing literature
- representative and robust: focused on the component to be described, proportionally responsive to the changes, they should avoid broad measures (eg GDP per capita)
- transparent and conceptually clear.

Furthermore, strengths and weaknesses of the composite index also derive from the core indicators, ie data sets describing the chosen component. These should be:

- reliable and open-source
- continuous, consistent, with global coverage
- potentially scalable from national to subnational, from yearly to seasonal (monthly) scale.

A composite index is typically a compromise between a data-driven and a user-driven model. There are always some components which existing data cannot describe, especially if the demands for quality of data are very high.¹⁵

Figure 14: Dimensions and indicators of INFORM



Source: INFORM 2015 Methodology, www.inform-index.org/In-depth/Methodology (accessed 4 February 2015)

Disaster Risk and Age Index methodology

The Disaster Risk and Age Index adopted the framework and aggregation methodology of INFORM 2015. Out of 53 indicators in INFORM 2015, 51 indicators were kept and two were dropped as irrelevant (children underweight and under-five mortality rate). Eleven of 51 indicators were altered – either by re-estimating, drawing from a different data source, or using a substituted by a similar indicator. The other 40 indicators are the original INFORM 2015 indicators with the original data and data sources.¹⁶

The Disaster Risk and Age Index is composed of the same three dimensions as INFORM 2015 which capture hazards and exposure that people face; how vulnerable older people are to hazards; and the availability of resources to help older people to cope with various hazards. The three dimensions are combined to produce an overall risk measure of humanitarian crises and disasters to older people (see Table 6). Apart from two indicators (Mobile phone users, and Internet users), data is taken from publicly available international datasets (see Table 6). For specific details and year of data, please refer to the index data spreadsheet at www.helpage.org

Hazard and exposure dimension

This dimension measures natural and human hazards such as exposure to earthquakes, tsunami, flood, and so on, as well as the probability of violent conflicts in a country. We retained the original hazard and exposure dimension of INFORM 2015. No changes were made to the indicator composition, data sources or aggregation methodology of the hazard and exposure dimension. We would have liked to use data on the number of older people exposed to and affected by earthquakes, tsunami, flood, droughts and conflicts but such data is presently not available for 190 countries. We hope this data gap will be addressed in the future.

Vulnerability dimension

This dimension captures vulnerability of older people to potential hazards. It was important to capture older people's socio-economic vulnerability as well as vulnerable groups among older people, such as UNHCR "People of Concern", and those affected by major health conditions such as HIV, tuberculosis and malaria. Most revisions were made in the vulnerability dimension. These changes included:

- re-estimation of Human Development Index (HDI) and Gender Inequality Index (GII) with data on older people
- replacement of the Multidimensional Poverty Index (MPI) with the Income Insecurity Index for older people
- use of UNHCR data on "People of Concern" aged 60 and over
- use of average mortality rate among people aged 60 and over from HIV, malaria, and tuberculosis.

HDI 60-plus aims to measure level of development by looking at health, knowledge and standard of living of older people, keeping the same framework and aggregation methodology as the original HDI. This included three original indicators: Life expectancy at 60, Mean years of schooling of people aged 60-plus, and GNI per capita. The measure of Expected years of schooling, was dropped as it is not relevant to older people. The aggregation methodology of HDI 60-plus is the same as the original HDI methodology.¹⁷

The Gender Inequality Index 65-plus is based on the Gender Inequality Index published in the *Human Development Report* (HDR). It captures gender inequality between men and women aged 65 and over in the areas of labour market and empowerment. The health indicator was dropped due to its focus on maternal mortality and adolescent fertility in the original GII.

The empowerment indicator of the GII 65-plus does not capture female and male shares of parliamentary seats due to lack of age-disaggregated data for 190 countries. The GII 65-plus includes two original indicators – female and male population with at least secondary education and female and male labour force participation rate. The age group used for GII is 65 and over because at this time we were not able to expand the age group to 60 and over due to the need for standardisation and aggregation of ILO data for age cohorts 60-64 and 65-plus.¹⁸ Future work on this indicator may include the introduction of (1) gender equality in the health (2) share of female and male parliamentary seats given availability of age-appropriate data, and (3) expansion to age cohort 60 and over.

The MPI is not available for the population over 60 and it is not possible to recalculate as data is not readily available for this age group. The MPI was substituted with a measure of income insecurity in old age. This was selected due to the understanding that a regular, decent level of income in old age is important for sustaining quality of life and wellbeing of older people. Inadequate pension income reduces an individual's standard of living below a decent level, especially when the pension is their only source of cash income. Absolute lack of income often leads to other forms of deprivation and experience of discrimination, humiliation and rejection.¹⁹ All of these factors can enhance an older person's vulnerability to crisis and disasters.

The right to an adequate standard of living is enshrined in the Universal Declaration of Human Rights (Article 25), of which article 22 explicitly enshrines the right to social security. We identify income insecurity as the proportion of people over 60 who do not have a pension and the proportion of people aged 60 and over living in households where equivalised income/consumption is below the poverty line threshold of 50 per cent of the national equivalised median income/consumption. The two indicators are aggregated with equal weight using geometric average. The data for indicators is taken from the Global AgeWatch Index 2014.²⁰ The original INFORM 2015 indicator UNHCR persons of concern all ages, was replaced with UNHCR persons of concern aged 60 and over.

In the vulnerable group component, Adult prevalence of HIV/AIDS, among aged 15-49, Tuberculosis prevalence, and Malaria mortality rate, from WHO were replaced with HIV/AIDS mortality rate, Tuberculosis mortality rate, and Malaria mortality rate, among the cohort aged 60 and over. The data source was also changed to Institute for Health Metrics and Evaluation (IHME) data. Other indicators in this dimension remain the original INFORM 2015 indicators with original data and data sources.

Lack of coping capacity dimension

The dimension measures lack of resources needed to help older people cope with hazards. It captures government's efforts in disaster risk reduction and the existence and accessibility of infrastructure required during emergency response. Four indicators were altered in this dimension. The other nine indicators are the original INFORM 2015 indicators with original data and data sources.

The changes include use of the adult literacy rate among people aged 65 and over and share of internet and mobile phone users among age group 50 and over. Finally, the original INFORM 2015 indicator Measles immunisation coverage among one-year-olds, was replaced with Mortality rate among people aged 60 and over from diarrhoeal infections, as a proxy of health system performance.

Calculation of Disaster Risk and Age Index value and interpretation of results

The original INFORM 2015 aggregation methodology was used in estimation of the Disaster Risk and Age Index. The value for the overall risk is calculated using a geometric average of the three risk dimensions with equal weights. The values of the dimensions and the overall risk range between scores of 0 (low risk) to 10 (high risk).

Constraints and future areas of work

The index framework and aggregation methodology were adopted from INFORM 2015. The methodological limitations of the latter apply to the Disaster Risk and Age Index as well: (1) flaws of a deterministic approach in Hazard and exposure dimension; (2) interactions among dimensions are not considered; (3) the usage of proxies limits the representativeness. For a detailed discussion on these constraints please, see Index for Risk Management INFORM Methodology "Concept and Methodology" 2015.²¹

Additional challenges encountered during the development of the index relate to data availability, coverage, lack of most recent estimates, standardisation of reporting, and accuracy.

A number of indicators do not have age-disaggregated data and when age-disaggregated data is available, datasets contain missing values. For example, indicators such as Access to electricity, Access to improved water source, Density of physicians, Health expenditure, Population affected by natural disaster/droughts/earthquakes/floods, Prevalence of undernourishment, Multidimensional poverty index, and others are not reported by age groups.

On the other hand, an indicator Mean years of schooling, is available for age cohort 60 and over, but only for 146 countries out of 190. Similarly, Literacy rate of people aged 65 and over, is available for 135 countries out of 190. Other age-disaggregated indicators such as Internet users, Mobile cellular users, Educational attainment of women and men, have missing values for a number of countries.

An additional limitation is that age bands are not standardised across international datasets. For example, UNESCO Literacy rate, is reported for the cohort aged 65 and over, while Gallup internet and mobile users, is reported for the age group 50 and over. ILO publishes Labour force participation rate, for age groups 60-64 and 65 and over, but standardisation and aggregation to derive the labour force participation rate of people aged 60 and over is required.

International data is not always available across the same year and or more recent years. For most indicators, data is from the period 2010-2013. However, for a few countries, latest Gini coefficient, and Literacy rate, data might refer to earlier years. For more information about the year of each data point please refer to the original data sources provided in the metadata section of the index excel sheet available at www.helpage.org/disaster-index

Quality of data for indicators such as UNHCR "People of Concern", might be poor as per INFORM 2015: "In many countries estimates are not reliable, for reasons of state censorship and lack of access by independent observers and also because it is not always easy to distinguish internally displaced persons (IDPs) from the local population, especially if they take shelter with relatives or friends."

Additional data limitations include: (1) omission of hazard events such as landslides, forest fires, heatwaves and volcanoes (2) omission of biological hazards (3) omission of technological hazards (4) lower reliability of the disaster risk reduction component. For more INFORM 2015 information, see De Groeve et al, 2014.²²

INFORM 2015 offers a framework to measure risk faced by the general population from crises and disasters. However, for older people, there might be additional hazard, vulnerability and capacity factors that might not have as much impact on other age groups. For example, heatwaves, cold waves and epidemics are often a major hazard for older people, but are not included. Similarly, Access to public transport, Data on disability, and Data on NCD prevalence, may also be factors which would be more important to include for the older population.

Therefore, the index framework needs to be reviewed by a wider group of experts on ageing and disaster to reflect these factors and to source data sets that may be more appropriate as proxies for disaster risk for older people. Also, very importantly, disaggregated data on disaster management achievement with regard to age-inclusive disaster management would also provide an important measure for the older population, as would disaster impact data disaggregated by age.

The next steps for improving the Disaster Risk and Age Index would be filling data gaps and updating datasets; standardising age groups across indicators; improving the quality of data (eg total person of concern); "fine-tuning" indicators (eg Number of people affected by earthquakes, tsunamis, floods, tropical cyclones, and storms as a share of the population aged 60 and over, MPI, GII, Prevalence of undernourishment, Average dietary supply adequacy) and using original indicators (for example, Tuberculosis prevalence, and HIV and AIDS prevalence) given availability of age-disaggregated data; inclusion of omitted indicators that pertain to older people's wellbeing; goal posts set, based on expert input.

The current Disaster Risk and Age Index is very much a pilot, but it is hoped that over time, as data improves and new data sets become available, the accuracy of such an index can be improved and the index can be used with increasing effectiveness to reduce disaster risk for the older population.

Table 6: Disaster Risk and Age Index indicators, descriptions and sources

 **Hazard and exposure**

Natural			
	Indicator	Description	Data provider
Earthquake	Physical exposure to earthquakes of MMI VI (absolute)	The indicator is based on the estimated number of people exposed to earthquakes of Modified Mercalli Intensity (MMI) 6 per year. It results from the combination of the hazard zones and the total population living in the spatial unit. It thus indicates the expected number of people exposed in the hazard zone in one year.	GSHAP
	Physical exposure to earthquakes of MMI VI (relative)	The indicator is based on the estimated number of people exposed to earthquakes of MMI 6 per year. It results from the combination of the hazard zones and the total population living in the spatial unit. It thus indicates the percentage of expected average annual population potentially at risk.	GSHAP, LandScan
	Physical exposure to earthquakes of MMI VIII (absolute)	The indicator is based on the estimated number of people exposed to earthquakes of MMI 8 per year. It results from the combination of the hazard zones and the total population living in the spatial unit. It thus indicates the expected number of people exposed in the hazard zone in one year.	GSHAP
	Physical exposure to earthquakes of MMI VIII (relative)	The indicator is based on the estimated number of people exposed to earthquakes of MMI 8 per year. It results from the combination of the hazard zones and the total population living in the spatial unit. It thus indicates the percentage of expected average annual population potentially at risk.	GSHAP, LandScan
Tsunami	Physical exposure to tsunamis (absolute)	The indicator is based on the estimated number of people exposed to tsunamis per year. It results from the combination of the hazard zones and the total population living in the spatial unit. It thus indicates the expected number of people exposed in the hazard zone in one year.	Global Risk Data Platform United Nations Environment Programme (International Centre for Geohazards/NGI)
	Physical exposure to tsunamis (relative)	The indicator is based on the estimated number of people exposed to tsunamis per year. It results from the combination of the hazard zones and the total population living in the spatial unit. It thus indicates the percentage of expected average annual population potentially at risk.	Global Risk Data Platform United Nations Environment Programme (International Centre for Geohazards/NGI), LandScan
Flood	Physical exposure to flood (absolute)	The indicator is based on the estimated number of people exposed to floods per year. It results from the combination of the hazard zones and the total population living in the spatial unit. It thus indicates the expected number of people exposed in the hazard zone in one year.	Global Risk Data Platform with key support from USGS EROS Data Center Dartmouth Flood Observatory United Nations Environment Programme
	Physical exposure to flood (relative)	The indicator is based on the estimated number of people exposed to floods per year. It results from the combination of the hazard zones and the total population living in the spatial unit. It thus indicates the percentage of expected average annual population potentially at risk.	Global Risk Data Platform with key support from USGS EROS Data Center Dartmouth Flood Observatory United Nations Environment Programme, LandScan
	Physical exposure to storm surges (absolute)	The indicator is based on the estimated number of people exposed to storm surges of Saffir-Simpson category 1 per year. It results from the combination of the hazard zones and the total population living in the spatial unit. It thus indicates the expected number of people exposed in the hazard zone in one year.	1975-2007 United Nations Environment Programme
	Physical exposure to storm surges (relative)	The indicator is based on the estimated number of people exposed to storm surges of Saffir-Simpson category 1 per year. It results from the combination of the hazard zones and the total population living in the spatial unit. It thus indicates the percentage of expected average annual population potentially at risk.	1975-2007 United Nations Environment Programme, LandScan
Tropical cyclone	Physical exposure to tropical cyclones winds of SS1 (absolute)	The indicator is based on the estimated number of people exposed to tropical cyclones winds of Saffir-Simpson (SS) category 1 per year. It results from the combination of the hazard zones and the total population living in the spatial unit. It thus indicates the expected number of people exposed in the hazard zone in one year.	Global Risk Data Platform United Nations Environment Programme
	Physical exposure to tropical cyclones winds of SS1 (relative)	The indicator is based on the estimated number of people exposed to tropical cyclones winds of Saffir-Simpson (SS) category 1 per year. It results from the combination of the hazard zones and the total population living in the spatial unit. It thus indicates the percentage of expected average annual population potentially at risk.	Global Risk Data Platform United Nations Environment Programme, LandScan
	Physical exposure to tropical cyclones winds of SS3 (absolute)	The indicator is based on the estimated number of people exposed to tropical cyclones winds of Saffir-Simpson (SS) category 3 per year. It results from the combination of the hazard zones and the total population living in the spatial unit. It thus indicates the expected number of people exposed in the hazard zone in one year.	Global Risk Data Platform United Nations Environment Programme
	Physical exposure to tropical cyclones winds of SS3 (relative)	The indicator is based on the estimated number of people exposed to tropical cyclones winds of Saffir-Simpson (SS) category 3 per year. It results from the combination of the hazard zones and the total population living in the spatial unit. It thus indicates the percentage of expected average annual population potentially at risk.	Global Risk Data Platform United Nations Environment Programme, LandScan
Drought	Annual drought probability	The indicator is based on the FAO Agriculture Stress Index (ASI) that highlights anomalous vegetation growth and potential drought in arable land. It is defined as the annual probability to have more than 30 per cent of agriculture area affected by drought.	FAO
	People affected by droughts (absolute)	The indicator shows the average annual affected population by droughts per country on the period from 1990 to 2013.	EM-DAT, CRED

Drought	People affected by droughts (relative)	The indicator shows the percentage of the average annual affected population per country by droughts on the period from 1990 to 2013.	EM-DAT, CRED
	Frequency of droughts events	The indicator shows the frequency of droughts events on the period from 1990 to 2013.	EM-DAT, CRED
Human			
Conflict risk	Conflict Barometer – National Power Conflicts	The Heidelberg Institute for International Conflict Research (HIIK)'s annual publication <i>Conflict Barometer</i> describes the recent trends in global conflict developments, escalations, de-escalations, and settlements.	Heidelberg Institute
	Conflict Barometer – Subnational Conflicts	The HIIK's annual publication <i>Conflict Barometer</i> describes the recent trends in global conflict developments, escalations, de-escalations, and settlements.	Heidelberg Institute
	GCRI Violent Internal Conflict probability	The Global Conflict Risk Index (GCRI) is an indicator that assesses the states' risk for violent internal conflicts.	JRC
	GCRI High Violent Internal Conflict probability	The Global Conflict Risk Index (GCRI) is an indicator that assesses the states' risk for violent internal conflicts.	JRC

Vulnerability

Socio-economic vulnerability			
Poverty & development	Human Development Index	The Human Development Index (HDI) measures the average achievements in a country by focusing on a long and healthy life, access to knowledge and a decent standard of living; however, levels of education and incomes of current generations of older people are not always comparable with that of younger generations. Therefore, the HDI was estimated using two age-disaggregated indicators, life expectancy at 60 and mean years of schooling of people aged 60+, and the third indicator GNI per capita. Indicator expected years of schooling was dropped due to lack of age-appropriate data.	WHO, Global Health Observatory Data Repository, Barro, Robert and Jong-Wha Lee, Human Development Index 2013
	Income insecurity	While the HDI measures the average achievement of a country in terms of development, income insecurity measures the level of inadequacy of income of older people in a country. Income insecurity of people aged 60 and over is estimated using two indicators: share of older people who do not receive a pension and share of older people who live below the poverty level (50 per cent of in country's median household income).	ILO, World Bank, OECD, Eurostat
Inequality	Gender Inequality Index	The Gender Inequality Index (GII) reflects gender-based disadvantages among people aged 65 and over. GII captures two dimensions – empowerment and the labour market. Two included indicators are attainment at secondary and higher education, and labour market participation rate. Parliamentary representation was dropped due to lack of age-disaggregated data. The health dimension was dropped due to focus on reproductive health. The value of GII ranges from 0 to 1, with 0 being 0 per cent inequality, indicating women that fare equally in comparison to men, and 1 being 100 per cent inequality, indicating that women fare poorly in comparison to men.	Barro, Robert and Jong-Wha Lee ILO Key Indicators of the Labour Market
	Gini Index	Gini Index measures the extent to which the distribution of income or consumption expenditure among individuals or households within an economy deviates from a perfectly equal distribution. Thus a Gini Index of 0 represents perfect equality, while an index of 100 implies perfect inequality.	World Bank
Economic dependency	Public aid per capita	This indicator is calculated by adding public development aid and humanitarian aid.	FTS (OCHA); OECD DAC
	Net ODA received (per cent of GNI)	Net official development assistance (ODA) consists of disbursements of loans made on concessional terms (net of repayments of principal) and grants by official agencies of the members of the Development Assistance Committee (DAC), by multilateral institutions, and by non-DAC countries to promote economic development and welfare in countries and territories in the DAC list of ODA recipients. It includes loans with a grant element of at least 25 per cent (calculated at a rate of discount of 10 per cent).	World Bank

Vulnerable groups			
Uprooted people	Total persons of concern (absolute)	UNHCR's population of concern aged 60 and over is composed of various groups of people including refugees, asylum-seekers, internally displaced persons (IDPs) protected/assisted by UNHCR, stateless persons and returnees (returned refugees and IDPs).	Global Trends 2013 UNHCR report
	Total persons of concern (relative)	UNHCR's population of concern aged 60 and over is composed of various groups of people including refugees, asylum-seekers, internally displaced persons (IDPs) protected/assisted by UNHCR, stateless persons and returnees (returned refugees and IDPs).	Global Trends 2013 UNHCR report
Other vulnerable groups	HIV/AIDS mortality rate	Average deaths due to HIV/AIDS among people aged 60-74 (per 100,000 aged 60-74). Both sexes, year 2010. Calculated across age groups 60-64, 65-69, 70-74.	Institute for Health Metrics and Evaluation (IHME). GBD Database
	Malaria mortality rate	Average deaths due to malaria among people aged 60+ (per 100,000 age 60+). Both sexes, year 2010. Calculated across age groups 60-64, 65-69, 70-74, 75-79, 80+.	Institute for Health Metrics and Evaluation (IHME). GBD Database
	Tuberculosis mortality rate	Average deaths due to tuberculosis among people aged 60+ (per 100 000 age 60+). Both sexes, year 2010. Calculated across age groups 60-64, 65-69, 70-74, 75-79, 80+.	Institute for Health Metrics and Evaluation (IHME). GBD Database

Other vulnerable groups	Percentage of population affected by natural disasters in the last 12, 24, 36 months	To account for increased vulnerability during the recovery period after a disaster, people affected by recent shocks in the past three years are considered. The affected people from the most recent year are considered fully while affected people from the previous years are scaled down with the factor 0.5 and 0.25 for the second and third year respectively, assuming that recovery decreases vulnerability progressively.	EM-DAT, CRED
	Average dietary supply adequacy	Average dietary energy supply as a percentage of the average dietary energy requirement.	FAO
	Prevalence of undernourishment	Prevalence of undernourishment expresses the probability that a randomly selected individual from the population consumes an amount of calories that is insufficient to cover her or his energy requirement for an active and healthy life.	FAO
	Domestic Food Price Level Index	A measure of the monthly change in international prices of a basket of food commodities.	FAO
	Domestic Food Price Volatility Index	The Domestic Food Price Volatility Index compares the variations of the Domestic Food Price Index across countries and time.	FAO





Lack of coping capacity





Institutional			
Governance	Government effectiveness	Government effectiveness captures perceptions of the quality of public services, the quality of the civil service and the degree of its independence from political pressures, the quality of policy formulation and implementation, and the credibility of the government's commitment to such policies.	Worldwide Governance Indicators World Bank
	Corruption Perception Index (CPI)	The CPI scores and ranks countries based on how corrupt a country's public sector is perceived to be. It is a composite index, a combination of surveys and assessments of corruption, collected by a variety of reputable institutions.	Transparency International
DRR implementation	Hyogo Framework for Action scores	The indicator for the Disaster Risk Reduction (DRR) activity in the country comes from the score of Hyogo Framework for Action (HFA) self-assessment progress reports of the countries. HFA progress reports assess strategic priorities in the implementation of disaster risk reduction actions and establish baselines on levels of progress achieved in implementing the HFA's five priorities for action.	ISDR
Infrastructure			
Communication	Adult literacy rate, adult total	Total is the percentage of the population aged 65 and above who can, read and write a short, simple statement on their everyday life.	UNESCO
	Access to electricity (per cent of population)	Access to electricity is the percentage of the population with access to electricity. Electrification data are collected from industry, national surveys and international sources.	World Bank
	Internet users	Share of people aged 50+ who said that their home has internet access. Both sexes. Year 2013 or latest available.	Gallup
	Mobile phone users	Share of people aged 50+ who said that their home has a cellular phone. Both sexes. Year 2013 or latest available.	Gallup
Physical connectivity	Access to improved sanitation facilities	Access to improved sanitation facilities refers to the percentage of the population using improved sanitation facilities. The improved sanitation facilities include flush/pour-flush (to piped sewer system, septic tank, pit latrine), ventilated improved pit (VIP) latrine, pit latrine with slab, and composting toilet.	World Bank
	Access to improved water source	The indicator defines the percentage of the population with reasonable access (within one kilometre) to an adequate amount of water (20 litres per person) through a household connection, public standpipe, well or spring, or rainwater system. An improved drinking-water source is defined as one that, by nature of its construction or through active intervention, is protected from outside contamination, in particular from contamination with faecal matter.	World Bank
	Road density	Road density is the ratio of the length of the country's total road network to the country's land area. The road network includes all roads in the country: motorways, highways, main or national roads, secondary or regional roads, and other urban and rural roads.	International Road Federation
Access to healthcare	Health expenditure per capita	Per capita total expenditure on health (THE) expressed in purchasing power parities (PPP) international dollar.	WHO Global Health Observatory Data Repository
	Mortality rate from diarrhoeal, lower respiratory infections, meningitis and other common infectious diseases	Mortality rate from diarrhoeal infections is a proxy of health system performance. Mortality rate from diarrhoeal, lower respiratory infections, meningitis and other common infectious diseases, both sexes, aged 60+ per population of 100,000. Calculated as an average across age groups 60-64, 65-69, 70-74, 75-79, 80+.	Institute for Health Metrics and Evaluation (IHME). GBD Database
	Density of physicians	Number of medical doctors (physicians), including generalist and specialist medical practitioners, per 10,000 population.	WHO Global Health Observatory Data Repository

Appendix 2: Disaster Risk and Age Index full results

Table 7: Disaster Risk and Age Index full results

Rank	Country	Overall risk	Hazard and exposure	Vulnerability	Lack of coping capacity	Rank	Country	Overall risk	Hazard and exposure	Vulnerability	Lack of coping capacity
1	Somalia	8.3	8.6	7.0	9.5	49	Eritrea	4.8	2.2	5.6	8.7
2	Central African Republic	8.3	7.8	8.3	8.7	50	Congo	4.7	2.3	5.8	7.9
3	Afghanistan	8.0	8.7	7.3	8.2	51	Benin	4.7	2.6	5.2	7.7
4	Sudan	7.3	7.3	7.0	7.7	52	Nicaragua	4.7	3.8	4.6	5.9
5	Yemen	7.3	7.9	5.7	8.4	53	Vanuatu	4.7	3.1	5.1	6.4
6	South Sudan	7.1	7.0	5.8	9.0	54	Guinea	4.6	2.7	4.5	8.3
7	Myanmar	7.0	8.2	5.9	7.2	55	Rwanda	4.6	2.3	6.9	6.3
8	Congo DR	7.0	5.4	7.3	8.5	56	China	4.6	7.2	3.2	4.3
9	Syria	6.9	8.4	6.8	5.7	57	Tajikistan	4.6	5.3	3.3	5.7
10	Iraq	6.8	8.2	5.5	6.8	58	Venezuela	4.6	4.2	4.2	5.5
11	Mali	6.7	6.0	6.6	7.6	59	Togo	4.6	2.1	5.6	8.1
12	Kenya	6.6	5.8	6.6	7.6	60	Mexico	4.5	8.3	2.4	4.6
13	Haiti	6.5	5.0	7.0	7.9	61	Sierra Leone	4.5	1.9	6.1	7.8
14	Uganda	6.5	6.2	5.9	7.6	62	Malawi	4.5	1.9	6.4	7.4
15	Chad	6.4	4.6	6.3	9.0	63	Swaziland	4.5	2.1	5.8	7.5
16	Pakistan	6.4	7.6	5.7	6.0	64	Angola	4.5	3.5	3.4	7.5
17	Mozambique	6.1	4.4	6.8	7.6	65	Cameroon	4.5	2.2	5.3	7.7
18	Philippines	6.0	8.3	5.0	5.2	66	Fiji	4.4	4.2	3.5	5.9
19	Niger	6.0	3.9	6.5	8.4	67	Turkey	4.4	6.1	3.5	4.0
20	Nigeria	5.9	6.8	4.4	6.9	68	Ecuador	4.4	4.6	3.9	4.7
21	Ethiopia	5.9	5.3	4.8	7.8	69	El Salvador	4.4	3.9	4.0	5.4
22	Libya	5.8	6.6	4.6	6.6	70	Vietnam	4.4	5.3	3.1	5.0
23	Burundi	5.8	3.7	7.1	7.6	71	Zambia	4.3	2.0	6.0	6.6
24	Colombia	5.8	6.4	6.7	4.5	72	Djibouti	4.3	2.8	4.1	6.9
25	Bangladesh	5.8	7.9	4.1	6.0	73	Georgia	4.3	4.1	4.6	4.2
26	Tanzania	5.8	4.0	6.5	7.5	74	Burkina Faso	4.2	2.1	4.9	7.2
27	Palestine	5.8	6.8	5.5	5.1	75	Timor-Leste	4.2	3.0	3.5	7.0
28	India	5.7	7.6	4.4	5.5	76	Bolivia	4.2	3.1	4.0	6.0
29	Mauritania	5.5	3.1	6.7	7.9	77	Lesotho	4.2	1.5	6.4	7.4
30	Nepal	5.5	5.5	4.6	6.5	78	Lebanon	4.1	3.9	3.9	4.6
31	Algeria	5.4	6.2	5.0	5.1	79	Guinea-Bissau	4.1	1.6	4.7	9.1
32	Indonesia	5.4	7.0	3.9	5.6	80	North Korea	4.1	2.3	4.2	7.1
33	Zimbabwe	5.4	3.4	5.9	7.6	81	Namibia	4.1	1.9	5.8	6.2
34	Cambodia	5.3	4.4	4.7	7.4	82	Jordan	4.1	2.3	5.7	5.0
35	Guatemala	5.2	5.4	4.6	5.8	83	South Africa	4.0	4.3	3.0	5.1
36	Papua New Guinea	5.2	2.8	5.8	8.7	84	Kyrgyzstan	4.0	4.1	3.0	5.4
37	Egypt	5.1	6.4	4.2	5.0	85	Moldova	4.0	4.0	3.1	5.2
38	Senegal	5.1	3.4	5.8	6.8	86	Azerbaijan	4.0	3.8	3.0	5.4
39	Iran	5.1	6.2	4.0	5.3	87	Serbia	4.0	3.2	4.2	4.5
40	Dominican Republic	5.0	5.0	4.8	5.2	88	Morocco	3.9	2.6	4.0	5.7
41	Solomon Islands	5.0	2.6	6.1	7.6	89	Brazil	3.8	5.1	2.4	4.6
42	Madagascar	4.9	3.6	4.3	7.7	90	Bhutan	3.8	2.7	3.3	6.3
43	Côte d'Ivoire	4.9	2.8	5.6	7.7	91	Saudi Arabia	3.8	2.7	4.1	4.8
44	Thailand	4.9	5.6	4.5	4.7	92	Liberia	3.7	0.9	7.0	8.0
45	Sri Lanka	4.9	5.8	4.3	4.6	93	Ukraine	3.7	7.0	1.4	5.5
46	Peru	4.8	6.2	3.5	5.3	94	Gabon	3.7	1.5	4.8	6.8
47	Lao PDR	4.8	3.3	5.2	6.6	95	Paraguay	3.7	2.3	4.4	5.1
48	Honduras	4.8	3.9	4.6	6.0	96	Uzbekistan	3.7	4.5	2.3	4.9

Rank	Country	 Overall risk	 Hazard and exposure	 Vulnerability	 Lack of coping capacity
97	Tunisia	3.7	2.3	3.9	5.4
98	Russia	3.6	6.0	1.5	5.1
99	Comoros	3.6	1.0	5.7	7.8
100	Gambia	3.5	0.9	6.5	7.5
101	Jamaica	3.4	3.4	2.7	4.4
102	Ghana	3.4	1.4	4.7	6.2
103	Malaysia	3.4	2.8	3.5	3.9
104	Turkmenistan	3.4	2.6	2.2	7.0
105	Panama	3.4	2.8	3.1	4.5
106	Bosnia & Herzegovina	3.4	1.9	3.9	5.0
107	Kuwait	3.3	2.2	3.8	4.6
108	Chile	3.3	4.8	2.3	3.3
109	Guyana	3.3	1.4	4.1	6.1
110	Armenia	3.2	2.3	2.8	5.3
111	Botswana	3.2	1.4	4.3	5.4
112	Albania	3.2	2.0	2.9	5.5
113	Mauritius	3.2	3.4	2.5	3.8
114	Mongolia	3.1	1.9	3.0	5.4
115	Samoa	3.1	1.2	5.2	4.7
116	Belize	3.1	2.5	2.3	5.2
117	St Kitts & Nevis	3.1	3.0	2.5	3.8
118	Kazakhstan	3.0	2.9	2.1	4.5
119	Tonga	3.0	1.5	4.1	4.5
120	Cape Verde	3.0	1.1	4.4	5.9
121	Micronesia	3.0	0.7	5.6	6.4
122	Seychelles	3.0	1.6	3.7	4.4
123	Costa Rica	3.0	2.8	3.1	3.0
124	Argentina	2.9	3.0	1.9	4.4
125	Cuba	2.9	2.8	2.2	3.7
126	St Lucia	2.8	2.7	2.2	3.8
127	Kiribati	2.8	0.8	4.2	7.0
128	South Korea	2.8	2.5	3.2	2.8
129	Antigua & Barbuda	2.8	3.4	1.7	3.7
130	Macedonia FYR	2.7	1.9	2.4	4.2
131	Greece	2.7	3.6	1.6	3.3
132	Romania	2.6	3.7	1.1	4.6
133	Japan	2.6	5.9	1.2	2.5
134	Palau	2.6	1.2	3.2	4.7
135	Croatia	2.6	1.8	2.9	3.4
136	Montenegro	2.6	1.3	3.3	4.0
137	United Arab Emirates	2.6	1.6	3.1	3.4
138	Canada	2.5	3.9	1.5	2.7
139	Israel	2.5	3.1	1.9	2.6
140	Grenada	2.5	1.8	2.0	4.0
141	Nauru	2.4	0.6	3.1	8.0
142	United States of America	2.4	5.7	0.9	2.5
143	Spain	2.3	3.1	1.6	2.5
144	Trinidad & Tobago	2.3	1.3	2.4	4.0

Rank	Country	 Overall risk	 Hazard and exposure	 Vulnerability	 Lack of coping capacity
145	Bulgaria	2.3	2.3	1.4	3.9
146	Italy	2.3	3.1	1.5	2.7
147	New Zealand	2.2	4.3	1.1	2.4
148	Portugal	2.2	1.6	2.0	3.3
149	Marshall Islands	2.2	0.3	5.6	6.5
150	Australia	2.2	2.6	1.8	2.3
151	Dominica	2.2	1.2	2.5	3.4
152	Poland	2.0	1.8	1.2	3.8
153	Oman	2.0	2.4	0.7	4.7
154	Slovakia	2.0	2.5	0.8	3.8
155	Belarus	2.0	1.4	1.3	4.2
156	Equatorial Guinea	1.9	0.5	1.7	7.6
157	Cyprus	1.9	1.4	1.9	2.6
158	Suriname	1.8	0.6	2.0	5.4
159	Hungary	1.8	1.9	1.2	2.6
160	Barbados	1.8	1.6	1.4	2.5
161	Bahrain	1.8	0.4	3.8	3.6
162	St Vincent & the Grenadines	1.8	0.9	2.0	3.3
163	France	1.8	2.7	0.9	2.4
164	United Kingdom	1.8	2.8	0.9	2.1
165	Uruguay	1.7	0.9	1.8	3.2
166	Germany	1.7	1.6	1.6	2.1
167	Czech Republic	1.6	1.1	1.3	3.0
168	Bahamas	1.6	1.9	0.8	2.9
169	Lithuania	1.6	0.7	1.8	3.1
170	Slovenia	1.5	1.5	1.1	2.2
171	Tuvalu	1.5	0.1	4.8	5.5
172	Qatar	1.5	0.5	2.6	2.6
173	Maldives	1.4	0.1	5.1	4.5
174	Ireland	1.4	1.0	1.4	2.1
175	Austria	1.3	1.4	0.9	2.0
176	Switzerland	1.3	1.2	1.3	1.4
177	Latvia	1.2	0.5	1.2	3.3
178	Belgium	1.2	0.9	1.1	1.9
179	Iceland	1.2	0.8	1.0	2.3
180	Brunei Darussalam	1.1	0.1	2.4	5.1
181	Estonia	1.1	0.3	1.5	2.7
182	Netherlands	1.1	1.1	0.7	1.6
183	Denmark	0.9	0.4	1.3	1.2
184	Luxembourg	0.8	0.3	0.8	2.1
185	Sweden	0.8	0.5	0.6	1.7
186	Norway	0.5	0.1	0.4	2.1
187	Singapore	0.4	0.0	2.0	1.7
188	São Tomé e Príncipe	0.4	0.0	4.3	6.7
189	Finland	0.3	0.0	1.0	2.2
190	Malta	0.3	0.0	2.3	2.8

Appendix 3: Countries demonstrating a difference between INFORM 2015 and the Disaster Risk and Age Index

The majority of differences between the two indexes are a combination of (1) data and (2) dropped or revised indicators, but also a reflection of differences between the current population of older people and younger groups.

Dominican Republic (higher risk values for older people)

- (1) According to UNHCR, at the end of 2013 there were 211,545 UNHCR “People of Concern” in Dominican Republic; 5 per cent or 10,577 of them are aged 60 or over. According to INFORM 2015, there are 721 refugees and no internally displaced or returned refugees. It is not clear why there is such dramatic difference.
- (2) According to the Disaster Risk and Age Index, the HDI value is 6.2 compared with INFORM 2015 3.8. This is partly due to the dropped indicator Expected years of school, and the lower average Number of schooling years, among older people (4.6 years) compared with people aged 25 and over (7.2 years). Income insecurity, of older people is 10, due to low pension coverage among older people (11 per cent of people aged 60 and over receive a pension). INFORM’s value for MPI across the general population is 0.4.

South Korea (higher risk values for older people)

- According to the Disaster Risk and Age Index, the HDI value is 4.0 compared with INFORM 2015 0.9. This is partly due to the dropped indicator Expected years of school, and the lower average Number of schooling years, among older people (7.2 years) compared with people aged 25 and over (11.6 years). Income insecurity, of older people is 10, due to lack of universal pension coverage among older people (77 per cent of people aged 60 and over receive a pension) and the high poverty rate among older people (47 per cent). INFORM’s value for MPI across the general population is not available. According to the Disaster Risk and Age Index, the Gender Inequality Index (GII), for people aged 65 and over is 3.9 compared with a general population GII of 1.3 in INFORM 2015. This is partly due to the dropped indicators Maternal mortality, Adolescent fertility rate, and Seats in national parliament. However, the education gap between older men and women is larger (58.2 per cent of men aged 65-plus with at least secondary education, compared with 23.4 per cent women aged 65-plus) than the gap between men and women aged 25 and over (91.7 per cent and 79.4 per cent respectively).

Kuwait (higher risk values for older people)

- (1) According to UNHCR, at the end of 2013 there were 94,665 UNHCR “People of Concern” in Kuwait; 4 per cent or 3,786 of them are aged 60 and over. According to INFORM 2015, there are 635 refugees and no internally displaced or returned refugees. It is not clear why there is such dramatic difference.
- (2) According to the Disaster Risk and Age Index, HDI value is 5.9 compared with INFORM 2015 2.0. This is partly due to the dropped indicator Expected years of school, and the lower average Number of schooling years, among older people (4.4 years) compared with people aged 25 and over (6.1 years). According to the Disaster Risk and Age Index, the Gender Inequality Index (GII), for people aged 65 and over is 7.0 compared with the general population GII of 3.8 in INFORM 2015. This is partly due to the dropped indicators Maternal mortality, Adolescent fertility rate, and Seats in national parliament. However, the education gap between older men and women is larger (33.2 per cent of men aged 65-plus with at least secondary education compared with 13.0 per cent of women aged 65-plus) than the gap between men and women aged 25 and over (46.6 per cent and 53.7 per cent respectively).

Saudi Arabia (higher risk values for older people)

- (1) According to UNHCR, at the end of 2013 there were 70,658 UNHCR “People of Concern” in Saudi Arabia; 3 per cent or 2,119 of them are aged 60 and over. According to INFORM 2015, there are 559 refugees and no internally displaced or returned refugees. It is not clear why there is such dramatic difference.
- (2) According to the Disaster Risk and Age Index, HDI value is 6.9 compared with INFORM 2015 1.7. This is partly due to the dropped indicator Expected years of school, and the lower average Number of schooling years, among older people (3.8 years) compared with people aged 25 and over (7.8 years). According to the Disaster Risk and Age Index, the Gender Inequality Index (GII), for people aged 65 and over is 10 compared with the general population GII 4.2 in INFORM 2015. This is partly due to the dropped indicators Maternal mortality, Adolescent fertility rate, and Seats in national parliament. However, the education gap between older men and women is larger (36.1 per cent of men aged 65-plus with at least secondary education compared with 7.8 per cent of women aged 65-plus) than the gap between men and women aged 25 and over (57.9 per cent and 50.3 per cent respectively).



Russia (lower risk values for older people)

- (1) According to UNHCR, at the end of 2013 there were 189,957 UNHCR “People of Concern” in Russia and none of them (0 per cent according to a 2011 estimate) were aged 60 and over. According to INFORM 2015, there are 369,229 refugees and 34,900 internally displaced people.
- (2) According to the Disaster Risk and Age Index, the Gender Inequality Index (GII) for people aged 65 and over is 1.2 compared with the general population GII 4.1 in INFORM 2015. This is partly due to the dropped indicators Maternal mortality, Adolescent fertility rate, and Seats in national parliament. However, the engagement in the labour market gap between older men and women is smaller (13.8 per cent of men aged 65-plus are in the labour force compared with 8.7 per cent of women aged 65-plus) than the gap between men and women aged 15 and over (71.0 per cent and 56.3 per cent respectively).
- Another reason is that according to IHME, Mortality rates from HIV and AIDS and tuberculosis, among the age group 60 and over are lower than among the age group 15-49. For HIV and AIDS, the mortality rate among people aged 60-plus is 17.6 per 100,000 while for the age group 15-49 it is 52.96 per 100,000. For tuberculosis, it is 11 and 15.11 respectively.

Ukraine (lower risk values for older people)

- (1) According to UNHCR, at the end of 2013 there were 41,717 UNHCR “People of Concern” in Ukraine; 1 per cent (end of 2011 estimate) or 417 of them were aged 60 and over. According to INFORM 2015, there are 2,968 refugees and 417,000 internally displaced.
- (2) According to the Disaster Risk and Age Index, the Gender Inequality Index (GII) for people aged 65 and over is 0.7 compared with the general population GII of 4.3 in INFORM 2015. This is partly due to the dropped indicators Maternal mortality, Adolescent fertility rate, and Seats in national parliament. However, the engagement in the labour market gap between older men and women is smaller (22.6 per cent of men aged 65-plus are in the labour force compared with 19 per cent of women aged 65-plus) than the gap between men and women aged 15 and over (66.6 per cent and 53.3 per cent respectively).

Endnotes

1. UNDESA Population Division, *Profiles of ageing 2013* puts the global proportion of over-60s at 11.7 per cent, www.un.org/en/development/desa/population/publications/dataset/urban/profilesOfAgeing2013.shtml (27 April 2014)
2. UNDESA Population Division, *World population prospects: the 2012 revision*, DVD edition, 2013
3. The Royal Society, *Resilience to extreme weather: executive summary*, London, 27 November 2014, <https://royalsociety.org/~media/policy/projects/resilience-climate-change/resilience-executive-summary.pdf>
4. United Nations Intergovernmental Panel on Climate Change, *Climate Change 2014: Impacts, Adaptation and Vulnerability – IPCC Working Group II Contribution to the Fifth Assessment Report*, 27 November 2014
5. Wilson N, ‘Hurricane Katrina: unequal opportunity disaster’, *Public Policy and Aging Report* 16(2), 2006, pp.8-13
6. HelpAge International, *Displacement and older people: the case of the Great East Japan earthquake and tsunami of 2011*, London, HelpAge International, 2013
7. HelpAge International, *Disasters and diversity: a study of humanitarian financing for older people and children under five*, London, HelpAge International, 2013
8. UNFPA, *Population Ageing in South and South East Asia: current situation and emerging challenges* 2006, www.eldis.org/vfile/upload/1/document/0708/DOC22434.pdf
9. DARA Impact matters, *Climate Vulnerability Monitor 2nd Edition*: <http://daraint.org/climate-vulnerability-monitor/climate-vulnerability-monitor-2012> (26 January 2015)
10. HelpAge International/COSE, *Typhoon Haiyan one year on: older people key to recovery*, London, HelpAge International, 2014, www.helpage.org/resources/publications/?adv=0&ssearch=&filter=f.year&type=®ion=&topic=&language=&page=2 (5 February 2015)
11. HelpAge International/COSE, *Typhoon Haiyan one year on: older people key to recovery*
12. ‘Older people’s inclusion in the Typhoon Haiyan response’, 2014, www.helpage.org/silo/files/older-peoples-inclusion-in-the-typhoon-haiyan-response.pdf
13. HelpAge International, *Disaster resilience in an ageing world: how to make policies and programmes inclusive of older people*, London HelpAge International, 2014
14. UNFPA expect a majority of people aged over 60 to live in urban contexts by 2020.
15. INFORM Methodology accessed at www.inform-index.org/In-depth/Methodology (9 February 2015)
16. Index for Risk Management INFORM Methodology ‘Concept and Methodology’ 2015, www.inform-index.org/Portals/0/InfoRM/INFORM%20Concept%20and%20Methodology%20Version%202015.pdf (9 February 2015)
17. UNISDR, Technical note 1 in *Human Development Report, Sustaining Human Progress Reducing Vulnerabilities and Building Resilience*, 2014, http://hdr.undp.org/sites/default/files/hdr14_technical_notes.pdf (2 February 2015)
18. GII 65+ was aggregated using the original methodology found in the Human Development Index 2014, Technical note 3
19. Zaidi A, *Global AgeWatch Index 2013. Purpose, methodology, results*, London, HelpAge International, 2013, p.9
20. For original data sources and year, see Knox-Vydanov C et al, *Global AgeWatch Index 2014 Methodology update*, London, HelpAge International, 2014
21. De Groeve T et al, Index for Risk Management INFORM Methodology ‘Concept and Methodology’ 2015, accessed at www.inform-index.org/Portals/0/InfoRM/INFORM%20Concept%20and%20Methodology%20Version%202015.pdf
22. Index for Risk Management INFORM Methodology ‘Concept and Methodology’ 2015

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