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TITLE: COMMUNICATION

SUBTITLE: SCIENCE COMMUNICATION

ASSET Project • Grant Agreement N°612236

ASSET

Action plan on SiS related issues in Epidemics And Total Pandemics

7th RTD framework programme

Theme: [SiS.2013.1.2-1 Sis.2013.1.2-1]

Responsible partner: **PROLEPSIS**

Contributing partners: **LYON, DBT, IPRI, NCIPD, DMI, UMFCD, HU, ZADIG**

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DOCUMENT MANAGEMENT

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History of changes:

Vn	Status	Date	Organisation / Person responsible	Reason for Change
V1	Draft	29/05/2016	PROLEPSIS	Adaptation to ASSET deliverable template
Vf	Final	30/06/2016	PROLEPSIS	Final

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EXECUTIVE SUMMARY

ASSET is a EU-funded cooperative program which combines a multidisciplinary set of expertise in order to address effectively scientific and societal challenges raised by pandemics and associated crisis management.

Engagement, gender equity, science education, open access, ethics and governance are thus the keywords encompassed in the main action plan launched in 2001 by the European Commission, with the aim to foster public engagement and a sustained two-way dialogue between science and civil society.

The taks on science communication aims at the wide dissemination of the scientific reults of ASSET to the wider research community of Europe. Within this context ASSET will start a research paper series that will hold an ISSN number, available on the project's website, and feature the main outputs from the project in the form of research papers. The research and innovation community will be targeted by this paper series as well as by academic papers published in peer reviewed open journals. At the project completion the book of the project will be submitted for publication to a major international publishinghouse. Furthermore, the research and innovation community will be targeted by hosting on the Furthermore, the research and innovation community will be targeted by hosting on the international science web portal “Scienceontheweb” (www.scienzainrete.it/en) a series of articles, videos, data-visualizations and news related to ASSET and its main topics.

This report describes the activities related to this task in the first two years of program implemnetation and the scheduled activities to the end o fthe project.

1. INTRODUCTION

The objective of this task to widely disseminate the scientific results of ASSET to the wider scientific community. The leader of the task is PROLEPSIS while the contributors include: LYON, DBT, IPRI, NCIPD, DMI, UMFCD, HU, ZADIG

More specifically: ASSET will start a research paper series that will hold an ISSN number, available on the project's website, and feature the main outputs from the project in the form of research papers. The research and innovation community will be targeted by this paper series.

In addition the scientific community will be targeted by:

- Academic papers published in peer reviewed open journals
- At the project completion the book of the project will be submitted for publication to a major international publishing house.
- Furthermore, the research and innovation community will be targeted by hosting on the international science web portal "Scienceontheweb" (www.scienzainrete.it/en):
- A series of articles
- Videos
- Data-visualizations and news related to ASSET and its main topics

2. The ASSET Paper Series

The on line paper series is titled "Epidemics and Pandemics, the Response of Society - ASSET Scientific Updates". The journal is available from the ASSET website.

The 1st issue is ready for publication and comprises the following articles:

1. Editorial: Science with and for Society (SwafS): The case for Epidemics & Pandemics by Professor Athena Linos
2. Origical Article 1: From Modelling Epidemics to Modelling Human Behaviour Impact on Epidemics: Personal Experiences and Perspectives for Science in Society by Alberto d'Onofrio
3. Original Article 2: Gender Issues in Pandemics and Epidemics, European Institute of Women's Health (EIWH)

A proposed schedule of articles for the on line paper series is presented below:

2016		
Month	**Index**	**Potential authors**
1st Issue - 1/16	***Science for and with Society aiming to the public health emergencies response and preparedness*** • *Editorial* Science in society strategy in public health emergencies	Professor Athena Linos – prolepsis Institute

	of international concern: beyond the theory • *Original articles* 1. Gender Issues in Pandemics and Epidemics: a double opportunity to action 2. From Modelling Epidemics to Modelling Human Behaviour Impact on Epidemics: Personal Experiences and Perspectives for Science in Society	European Institute of Women's Health (EIWH) IPRI - Alberto d'Onofrio
2nd Issue - 5/16	***Democracy and human rights under Public Health Emergency (PHE) threat*** • *Editorial* The extent of public concern about democracy and human rights during PHE • *Original articles* 1. Do conflicts of interest matter during PHE? 2. Ethics, law and rights in preparedness for epidemics and pandemics	TBT HU- Manfred Green ZADIG – Roberto Satolli-Eva Benelli
3rd Issue - 9/16	***National borders and the spreading of diseases*** • *Editorial* Borders and effective response to PHE: is a deal possible? • *Original articles* 1. Intentionally caused outbreaks: secrecy vs transparency 2. Roadmap to open and responsible research and innovation in Pandemics	ZADIG – Donato Greco FFI- Kjersti Brattekås LBP- Mitra Saadatian
4th Issue - 12/16	***The participatory Governance for PHE*** • *Editorial* Consulting citizens under PHE threat: any usefulness? • *Original articles* 1. The role of citizens in the debate of pandemic crisis prevention and management 2. The role of the training for disasters and PHE preparedness - Data Visualisation	TBD DBT – John Haukeland TIEMS – Harald Drager

2017		
5th Issue - 1/17	***The "mobilization and mutual learning action plan" projects*** • *Editorial* MMLAP: a valid approach to promote PHE response and preparedness? • *Original articles* 1. The ASSET action plan as a handbook for PHE preparedness 2. MMLAP and its toolbox: the ASSET experience	ISS – A Perra ZADIG – R Villa Prolepsis
6th Issue – 5/17	***The Social Networks in PHE preparedness and response*** • *Editorial* Lessons learnt from the past: what is the role of the social networks? • *Original articles* 1. High time to strike a balance of the interaction of ASSET project with social networks 2. Does it make any sense of recording SN opposite reactions to decrease of European vaccines coverage?	ISS – V Possenti ZADIG – E Benelli NCIPD -
7th Issue – 9/17	***Health professionals involvement in PHE preparedness*** • *Editorial* What have we learned from the influenza vaccination campaign: why health professionals are less likely to get vaccinated? • *Original articles* 1. Best practice award for GPs: what is new from the recent European experience 2. R&I: indications for the role of the health professionals from the ASSET Best Practice Platform	UMFCD – M Popea Prolepsis ISS – B De Mei
8th Issue - 12/17	***RRI and citizens in PHE preparedness*** • *Editorial*	

	From the ASSET experience: any bridge is possible between the Scientific Community and the citizens? • *Original articles* 1. PPI: a good perspective to get citizens and research community to communicate 2. Recognition of the less studied themes concerning citizens in preparedness and response to PHE	ASSET consortium members LBP IPRI, LBP, other consortium members

3. Academic papers published in peer reviewed open journals

The following scientific articles have been proposed by the scientific coordinating team and will be prepared for publishing:

WP2.1 - Governance of Epidemics and Pandemics: Partner: University of Haifa: Lead author: Manfred Green

This report reviews the issue of governance of pandemics and epidemics from three interrelated perspectives. Each perspective involves a different stakeholder which participates in the process of risk communication, and performs its own role. International public health cooperation is essential to mitigate the spread of epidemics. Therefore, these stakeholders need to collaborate and communicate with each other in order to identify a pandemic and reduce spread.

The first part of this report reviews the role and performance of World Health Organization (WHO) during the 2009 H1N1 pandemic. WHO revised the International Health Regulations (IHR, 2005) and has strengthened its position as a central global health force with authority and accountability in the field of international health. We investigated the eight core capacities defined by the IHR, and identify some gaps in the conceptual framework for monitoring these capacities. We also analyzed two case studies for compliance with the revised IHR in Israel and Ukraine.

The second part of this report deals with a different stakeholder - the pharmaceutical industry and its performance in the process. In general, we examined the issue of Conflict of Interests (CoI) between health authorities and pharmaceutical companies, and around the potential impact of those companies on the decision making process held by health authorities. Their influence ranges from providing finances to the "revolving door" phenomenon. The last part of this report deals with the role of the media as the one who should have monitored governance performance during the 2009 H1N1 pandemic. We examined the communications occurred between the media and two central health authorities: WHO and the Center for Disease Control and Prevention (CDC). Both authorities held virtual press conferences during the pandemic, so we could study the issues the journalists focused on and asked about: The declaration of the H1N1 influenza as such, the decision to hasten vaccines' production,

and transparency of stakeholders' conduct in the decision making process and possible conflicts of interests.

WP2.2 – Reference guide for Unsolved Scientific Questions for Epidemics and Pandemics: Partner: Lyonbiopole: Lead author: Estelle Vincent

The aim this report is to outline, from the scientific and technical literature, the main unsolved scientific questions regarding pandemics, with particular focus on influenza and, of course, by taking as particular case study H1N1 2009 pandemics.

The global aim is to identify what need to be done yet in case of a possible future pandemic.

To structure the report we followed the classical four-step paradigm for decision making: Decision Input, Decision Making, Decisions Output and Communication.

The analysis of decision input imped the review of the state of the art in surveillance of emerging pathogens with potential risk of causing Pandemics; the analysis of decision making implied the review of the literature on decision making during H1N1 pandemics; the following step (Decisions Output) involves the review of the preparedness and response enacted during the H1N1 pandemics; finally the analysis of the communication involved a review of the processes of "Risk Communication" and a review of an important issue during pandemics and epidemics: the changes in human behaviour (and its impact) following non-mandatory recommendations by Public Health Authorities.

As requested by the technical annex of the ASSET project, we complemented our analysis by means of an appropriate questionnaire, sent to experts in the field of pandemics and epidemics. Their responses agree at a large extent with our analysis, and they are reported in appendix (Annexe 1).

WP2.3 – Crisis Participatory Governance: Partner: The International Emergency Management Society (TIEMS): Lead author: Kailish Gupta

Background: In epidemics and pandemics rumors and parallel informal information systems have challenged effective risk communication by health workers and authorities, as evidenced, inter-alia, in the current ongoing Ebola epidemic in West Africa. Research studies have shown that rumors perpetually surface in situations that entail power asymmetries. Such situations often arise when knowledge is contested or is left to a small group of highly technical experts to unravel. Individuals or groups left outside such confined knowledge-hubs often produce their own version of the reality, in effect creating ‘rumors’. In the case of the current Ebola outbreak many rumors have flourished. Amongst the most ‘popular’ is that Western health workers spread the disease, based on American imperialistic visions. This problem has manifested itself as locals hiding sick or dead people. Such rumors constitute parallel information systems which are linked to the application of top-down communication systems and absence of genuine two-way communication systems.

The loss of confidence in international and national health authorities has had a strong impact on vaccination too, affecting not only flu, but also other infectious diseases. Since 2009 rumors and false myths about risks of vaccines have changed attitudes of many families, contributing to reduced

immunization rate in some areas, leaving clusters of children unprotected, i.e. against polio, and preventing the achievement of important goals, such as measles eradication from Europe.

Rumors form rapidly during the outbreak of a crisis. Despite efforts by the authorities to deliver correct information, a social reality has arguably already been formed, which rational information is unable to alter. However, whereas rumors are an answer to a call for information from citizens, Crisis Participatory Governance practices might answer this call with better information and alter the spread of rumors.

Objectives: The challenges confronting policy-makers and health practitioners' today call for more inclusion of citizens and civil society in risk communication and organized response to epidemic and pandemics threats, in such a way that rumor will not be the main information channel. Pioneering such citizen engagement we have coined the term 'Crisis Participatory Governance.'

Crisis Participatory Governance starts with effective risk communication that is entirely contingent on successfully identifying the cultural dimensions and priorities of the targeted groups. In doing so, it is critical that the identification is a result of an upstream and downstream, two-way communication process.

Methods: For this report we reviewed the literature on research in participatory governance during crisis, including epidemics and pandemics. We examine aspects of governance at the local, national and international levels for crisis in general, and relate it to infectious disease crisis such as epidemics and pandemics. We disucss crisis participatory governance in the context of case studies including the South Sudan Secession Crisis, the 2009 H1N1 pandemic, and the present Ebola epidemic.

Findings: We have dissected the Crisis Participatory Governance concept into four overlapping phases of Resilience and Sustainability, Pre-Crisis, Crisis, and Post-Crisis. We have dealt with different crisis participatory governance challenges associated with each phase. For each phase we have identified Crisis Participatory Governance Tools, as depicted in Table 2. We have also discussed models and experiences of recent epidemics and pandemics in the context of each of the four phases of Crisis Participatory Governance. Our findings reveal the importance of flexibility in adapting participatory governance activities to different epidemics and to the targeted community. For example during the 2009 H1N1 pandemic, standardized public communications, while factual and useful in some contexts, failed to adequately create understanding of lethality and spread in some areas. A lack of trust in authorities led to rumors, hindering vaccination programs and other health care initiatives.

Conclusions: Good governance is the backbone for equitable and sustained development and effective participation by all people has come to be viewed as a necessary requirement. Participatory governance means including citizens in decision making that has implications for their wellbeing, and transparency in the decision making and implementation processes. This is particularly important during the time of crisis, as people become the center of both providing aid and receiving it. We have developed a model in this report that can guide the use of Crisis Participatory Governance in structuring the four phases of future epidemics and pandemics. However our analysis also shows the critical importance of adapting plans to local conditions through continuous feedback, engaging the public on a day-to-day basis.

WP2.4 – Ethics, Law and Fundamental Rights: Partner: ZADIG: Lead author: Eva Benelli

The present report contributes to the accomplishment of a major objective of the ASSET project, which is the establishment of baseline knowledge on Science-in-Society related issues about pandemics, within the wider scope of Work Package 2 (WP2: Study & Analysis). The principal focus of this report is to provide an overview and discuss relevant ethical, legal and fundamental rights considerations in situations of public health emergencies, such as epidemics and pandemics. There is a saying that goes, "extraordinary circumstances demand extraordinary measures", and on this basis the report extends further to offer an array of practical recommendations on how fundamental human rights and ethical considerations can better inform the decision-making process in the need to apply these "extraordinary measures". Exceptional circumstances must not provide an alibi for pandemic planners and policy makers to ignore fundamental human rights and ethical tensions that can arise at different phases of a pandemic.

The first part of the report presents the international policy landscape on what constitutes fundamental human rights, both at EU and world level. More specifically, the Charter of Fundamental Rights of the European Union (CFREU) is presented as a legally binding instrument that sets out the basic rights that must be respected both by the European Union and the Member States when implementing EU law, and the provisions of which are discussed, under the prism of public health emergency situations. In recognition of the fact that the rights and principles listed in the CFREU are not always specific or relevant to public health emergencies, the report further explores the way in which fundamental human rights find application in the healthcare and medical context, with examples used from international policy documents, such as the WHO International Health Regulations (2005), the Universal Declaration on Bioethics and Human Rights (2006), and the WMA Declaration of Lisbon on the Rights of the Patient (1981).

These international policy instruments do provide a concrete framework for the formulation of national policies in the event of a large scale public health emergency, however, there are occasions in which specific decisions or the implementation of certain measures may come to direct conflict with ethical principles and values, even if these decisions or measures are in accordance with established policies and laws. Ethical principles and societal norms may often come into tension with priorities and needs in a state of emergency, and decision makers are required to critically assess and timely take decisions on the best available evidence at every phase of the pandemic. Although it would be impossible as a task to cover every possible pandemic scenario, the section on "ethical issues and considerations in pandemics" addresses key points and promotes ethical best practice in the event of public health emergencies. Key principles and values are presented that should be considered in addressing fundamental rights (e.g. restriction of personal freedoms), ethical issues (e.g. duty to provide care), societal issues (e.g. priority-setting) and political issues (e.g. international cooperation) in pandemic preparedness and response. These principles are described as "key principles" since they inform every activity and decision at all phases of a pandemic.

It should be noted that this report draws on existing evidence from the scientific literature, international agencies' technical reports and policy documents to offer an insight on ethics-related issues and generic

approaches, instead of creating a promise for solutions to ethical problems, which problems can rarely be solved in the absence of specific contextual details. It is envisaged with this report to provide to policy makers, health care professionals and citizens stakeholders an additional platform for deliberation on science-in-society related issues in epidemics and pandemics.

WP2.5 - Gender Issues in Epidemics and Pandemics: Partner: European Institute of Women's Health: Lead author: Vanessa Moore

ASSET project (Action Plan on Science in Society in Epidemics and Total Pandemics) is a 48-month long project with the aim to address scientific and societal challenges raised by the occurrence of pandemics and epidemics.

The main objectives of ASSET are to (i) establish baseline knowledge about influenza epidemics and pandemics and their wider societal implications (ii) the extent of research and innovation into epidemics and pandemics (iii) the existing operational and regulatory environments across Europe.

This report aims to look at gender differences that effect exposures to infectious diseases as well as access to, information on, and use of, vaccinations in pandemics and epidemics. By using a targeted gender approach, as well as including different population groups for example by age, socioeconomic status, minority status, and gender, a societal perspective is presented that connects with a scientific approach. This also helps highlight existing inequalities in health, as well as focus on prevention and viewing issues across the lifespan and not in isolation.

Highlighting evidence-based issues of gender in pandemics and epidemics fits in to the overall ASSET objective by investigating the societal challenges that exist in these areas. This report is divided into two parts, a literature review and a section of interviews with relevant stakeholders.

The literature review aims to systematically study the available literature regarding gender issues in pandemics and epidemics. The goal is to gather information on current research as well as to identify gaps where more research is needed.

Interviews were conducted with stakeholders from various areas concerned with pandemics, epidemics, and vaccinations, in order to gain more insight into gender issues. Methods and findings from these make up the second part of this report.

WP2.6 – Intentional Outbreaks: Partner: FFI: Lead author: Kjersti Brattekas

Background: The possibility of intentionally caused outbreaks represents a concern for law enforcement, governments and public health officials around the world due to its possible high consequences.

The problems posed by intentionally caused outbreaks have been addressed with three approaches in this report:

- Analyses of history, terrorism and science progress and its potential consequences (sections 2-4)
- Countermeasures to respond to any biological threat (section 5)

- Overview of international and national policies (Sections 5-6)

D2.6 includes an analysis of the current knowledge and main policy documents concerning intentionally caused outbreaks and a taxonomy of the main governance problems posed by the risk of intentionally caused outbreaks in democratic societies, chiefly the tension between secrecy and transparency, freedom of research and security, citizen involvement and experts' decisions.

Objectives: The objectives of this report are to collect and analyse relevant policy documents and create a taxonomy of the main governance problems posed by the risk of intentionally caused outbreaks in democratic societies.

The main objective is to create the taxonomy, or classify, the main governance problems posed by intentionally caused outbreaks based on the analysis made in the document. Therefore, it has been important to research a vast background of materials, including science and academic reports, policy documents and historical reviews.

Methods: In order to reach the objectives for this report, we have used the method of document analysis and created a taxonomy based on the results from the analysis. The focus for the document analysis has been divided into a historical overview of intentionally caused outbreaks, a review of state-of-the-art literature with aspects relevant for this report, and a review of main policy documents focusing on the issues included in the taxonomy.

The taxonomy has been developed in collaboration with the ASSET partners involved in Task 2.6. Firstly, the main problem areas are qualitatively described and analysed based on state of the art and the main policy documents. Thereafter, the taxonomy has been developed and populated as a table cross-categorising the problems.

CONCLUSIONS AND RECOMMENDATIONS

The aim of Task 7.5 is to widely disseminate the ASSET scientific results to the scientific community. ASSET is not a research project thus especially during the 1st stage of project implementation the ASSET findings suitable for scientific publications were scarce. This is basically the reason for the delay in developing the ASSET on line paper series and the delay in deciding on further scientific publications for peer review articles.

For the coming months the ASSET consortium will be working towards the publication of a special edition in the journal of Disaster Medicine and Public Health Preparedness. In addition Prolepsis with the WP leader will be preparing videos and other publications linked to the ASSET on line paper series.

Annex 1: Online paper Series – 1st Issue contents

influenza occur in adults aged over 65 years, or among well-defined risk groups such as children under the age of 5, or those with underlying medical conditions [1]. Vaccination is widely recognised as the most effective way to prevent influenza infection [2]. Immediate access to an influenza vaccine is regarded as a major component of pandemic preparedness planning [3].

Differences based on sex and gender are important in understanding and improving outcomes and uptake rates for vaccination. A gender-specific focus can be described as "research [that] comes from an approach that is considerate of the multifaceted nature of gender" [4 p. 199]. Gender refers to socially constructed roles, behaviours, activities, and attributes that a given society considers appropriate for men and women. Sex refers to the biological and physiological characteristics that define men and women, boys and girls. Studies have found that differences between gender became smaller with age and statistically insignificant; while other studies found no difference by gender [1]. Bish et al found that amongst both the general population and health professionals, men were more likely to intend to be vaccinated and to be vaccinated than women [5].

These examples of research clearly show gender is not sufficiently or correctly analysed as a variable.

2. Methodology

The study is divided into two parts, a literature review and semi structured interviews with eight key stakeholders.

For the literature review, searches were conducted to identify papers in peer-reviewed journals on the topic of gender, epidemics and pandemics. Searches of databases included PubMed, Web of Science, Embase and CINHAL using search terms gender, pandemic, influenza, vaccine, and epidemic between Aug 5 and 10, 2014. No date restrictions were applied to the searches. In addition, the databases of Eurostat, Centre for Disease Control (CDC), European Centre for Disease Prevention (ECDC), World Health Organisation (WHO), International Longevity Centre (ILC), and the European Medicines Agency (EMA) were searched as well as Google to find any additional grey literature.

For the stakeholder interviews, qualitative semi-structured interviews were conducted. (See Appendix A) A list of suitable stakeholders was compiled by the researchers, based on the reach of the organisations and the stakeholder's involvement. The researchers transcribed all interviews verbatim, and analysed the transcripts using Framework Analysis, which was deemed to be the most appropriate approach [6].

3. Results

3.1 Literature review

Sex differences in influenza and vaccination

Biologically, females and males differ in their immunological responses to seasonal influenza virus vaccines. The antibody response of a female to half a dose of influenza vaccine is equivalent to the antibody response of a male to the full dose [7].

Women also report a worse reaction to vaccinations than men do [8]. These adverse reactions may be caused by the dose being too high. More research is needed into this area; female reactions to vaccinations should be incorporated into clinical trials and sex and gender should be considered when evaluating the efficacy of antiviral treatments [9].

Pregnancy

Women who are pregnant are more likely to have severe disease and hospitalisation with either seasonal or pandemic influenza.

During pandemics, the mortality rate for pregnant women is higher than non-pregnant women, however this is not the case with seasonal influenza [9].

The WHO recommends all pregnant women to receive vaccinations during the influenza season, and that they should be given highest priority among all the at risk groups [10]. Yet, despite recommendations such as these vaccine coverage for pregnant women tends to lag behind the general population [8].

Evidence points to pregnant women not knowing of the increased risks associated with pregnancy and influenza; also, many health care providers do not recommend pregnant women to take vaccine due to concerns over giving a vaccine to a pregnant woman [9]. Such inconsistent advice from relevant health care providers is an obvious obstacle to uptake of vaccination for pregnant women [11].

Health care workers

Women represent more than 50% of the healthcare workforce in many countries; also, in most countries nurses, teachers and childcare workers are mainly female [9]. For example 80.2% of employees in the Irish health services are women, and women account for 92.1% of nurses [12]. Front-line workers face disproportionate risks of illness and death during a pandemic [13]. Studies have generally shown compliance rates from as low as 10% to 40-50% among health care workers, with no clear pattern to ascertain why this is [14]. There exists little consensus on how to target the low vaccination rates of health care workers, and more research is urgently needed.

Underlying medical conditions

People with already existing conditions, such as cardiovascular diseases, diabetes, and pulmonary/respiratory disease, are at greater risk from influenza [15]. Women are more likely to have diabetes in their lifetime than men, and studies in the US show that women, particularly those in lower socioeconomic groups, receive less adequate diabetes care than men from the same socioeconomic group [9]. Vaccinations along the life course trajectory should be considered a normal part of adult life and not just childhood, and that emphasis on vaccination should include those over 50 years of age [16]. Lowering the age limit for vaccination may be effective in increasing vaccine uptake [11]. A Spanish study found that

among those under 65 years of age with chronic conditions, influenza vaccination figures are very low at approximately 30% [17]; changing the vaccination age limit to 50 and over may help increase this number.

Hard to reach groups

Hard to reach groups may have adverse health outcomes, and the complex interplay of gender and social and economic marginalisation makes this a particular issue for women [18]. There are a number of minority groups in society which have adverse health outcomes and where women are particularly affected, for example the Roma community and Irish Travellers. Women in hard to reach groups are particularly marginalised.

Creating an environment which improves access to health, and health-seeking behaviour for all, is recommended. Engaging in strategies that increase educational attainment for women are important in redressing inequities that contribute to adverse health outcomes [18 p. 1038].

Older women

Persons over the age of 65 have a higher risk for severe influenza-related complications and have the highest risk of mortality from influenza. Vaccination of older persons have traditionally been the main focus of influenza vaccine policy and remains the most effective public health tool to protect against influenza [10]. Barriers to the uptake of vaccinations by older women rests with issues such as increased frailty, ill health, widowhood, and social isolation. More inclusive clinical research, as well as more research and data collection on older women's health in general, is needed [18].

Distrust of vaccinations

In Europe, nine out of every 10 children receive at least a basic set of vaccinations during infancy [19]. However, there is a great difference between being under-vaccinated, which might be due to marginalisation or healthcare inequalities, and un-vaccinated. Despite a comparatively high level of vaccination, there exists scepticism and distrust of vaccinations in Europe - some lack awareness or interest in vaccinations, while some refuse it on philosophical grounds [20].

Communication and transparency are both at the centre of strategies dealing with distrust and scepticism towards vaccination. The role of the media, both traditional media and more recent social media, is crucial for disseminating information about pandemics, epidemics and vaccination. Interestingly, females are more likely than males to trust print media, the Internet, and television as a source of health information [21]. This has repercussions in terms of how to approach and connect with women who are sceptical about vaccinations. One systematic review [22] found that messages that consider demographic, ethnic and social differences allow for more effective and targeted communications. Based on this, they argue that vaccination coverage and protective behaviours may both increase if such improved communication strategies were to be employed while dealing with various specific groups, such as gender.

3.2 Stakeholder interviews

A total of eight stakeholders agreed to participate in interviews discussing gender perspectives of influenza epidemics/pandemics and vaccination. The stakeholders interviewed were:

- The Pharmaceutical Group of the European Union (PGEU)
- International Longevity Centre UK (ILC-UK)
- The Strategic Advisory Group of Experts (SAGE) on Immunisation, WHO
- European Centre for Disease Prevention and Control (ECDC)
- European COPD Coalition (ECC)
- Confederation of Meningitis Organisations (COMO)
- Irish Nurses and Midwives Organisation (INMO)
- European Federation of Nurses Associations (EFN)

Below is a summary of the stakeholder findings based on the issues identified throughout the interviews.
Gender – Only one stakeholder reported having a specific focus on gender issues. Many stakeholders were of the opinion that influenza does not discriminate by gender – this belief leaves out the unique challenges presented by gender as detailed in the literature review.

Pregnancy – There was a high awareness and proactive behaviour from all stakeholders on this issue.

Communication - All involved participants continuously stressed the importance of effective communication, making it the largest issue identified in our data – however, this was identified more as a general problem.

Hard to reach groups –Some stakeholders recognised this problem, and the solution suggested was one of tailored and increased communication.

Health Care Workers – very little awareness of the gendered situation of this group.

Older women -- the near absence of identified strategies or targeted messages for older women by the stakeholders make this an area where much more emphasis is needed.

4. Discussion and Recommendations

Evidence compiled in this report from both the literature and the stakeholder interviews clearly shows that there is a need for a more gendered approach to influenza pandemics/epidemics and vaccination. A life-course approach to influenza vaccination is important for all groups, however the specific needs for women and in particular for hard to reach groups, are crucial for protection against influenza pandemics and epidemics. Identifying the population at risk and their specific needs will require a comprehensive public health communications strategy in order to promote awareness of this issue.

Based on this, we wish to suggest the following recommendations:

- Health literacy should be considered in the development of all vaccination promotion initiatives at all levels and settings.
- Develop clear communication strategies at the EU, national and regional level on influenza pandemics/epidemics and vaccination.
- Promote increased awareness among health professionals in relation to vaccination and the importance of consideration of a life course approach.

- Update, clarify and standardise influenza vaccination advice materials for pregnant women.
- More emphasis on the needs of older women and men should be included in national vaccination strategies.

More research is needed into the gendered effect of influenza and vaccination on healthcare workers and carers.

- Further research is needed into the barriers to accessing information on vaccination from a gender perspective.
- Research that target women's attitudes to influenza and vaccinations is recommended.
- Support the inclusion of women in clinical trials.
- Support the standardisation of data collection methods in relation to sex and gender.

Appendix A

1. How would you describe your communication strategy and/or your information policy in relation to vaccination take-up, and influenza epidemics/pandemics, from a gender perspective?
2. Does your organisation have any awareness strategy in relation to gender differences in vaccination strategy, or have you ever had one?
3. What are your organisation's policies on pregnant and breastfeeding mothers in relation to vaccinations? What is your general advice to pregnant/breastfeeding mothers in terms of vaccinations during influenza epidemics and pandemics?
4. How would your organisation inform older women and their specific needs in relation to influenza vaccination uptake?
5. Health care workers tend to be predominantly female. What particular emphasis does your organisation have on the female health care work force in terms of influenza vaccinations?
6. How does your organisation interact with health care workers such as GPs to avail of their role as advisors to the wider community regarding vaccinations during influenza epidemics/pandemics?
7. How does your organisation interact with caregivers from a gender perspective, and how do you engage specifically with them and their vaccination uptake in an influenza epidemic/pandemic?
8. How does you reach marginalised group/vulnerable groups in society in relation to vaccination uptake and gender specifics?
9. To what extent are you approaching vaccinations through a life-course strategy?
10. What information and research gaps do you see in epidemics and pandemics in terms of gender issues?

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