

Enabling Functional Ability

30 April
2019

10:00 - 11:00 AM
Eastern Daylight Time

Post-Conference Education Webinar Series

What is the role for public policy and technology in increasing immunisation uptake across the life course?

Translating Evidence for the Decade of Healthy Ageing

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Moderated by:

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What is the role for public policy and technology in increasing immunisation uptake across the life course?

David Sinclair, Director, ILC

Lily Parsey, Policy and Communications Officer, ILC

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What happens next

About ILC-UK

- ILC-UK was established in 1997 as one of the founder members of an international network on longevity (ILC Global Alliance)
- The ILC is the UK's specialist think tank on the impact of longevity on society.
- We are experts in demographic change, ageing and longevity.
- We work with an actively engaged network of experts, policy makers and practitioners.



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The Spanish Flu, 100 years on - Lessons learned

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A quick history of the Spanish Flu

- The deadly influenza pandemic infected around 500 million and killed between 50 and 100 million people
- It killed more people in 24 weeks than AIDS did in 24 years
- The Spanish Flu claimed more lives than World War I or the Black Death.

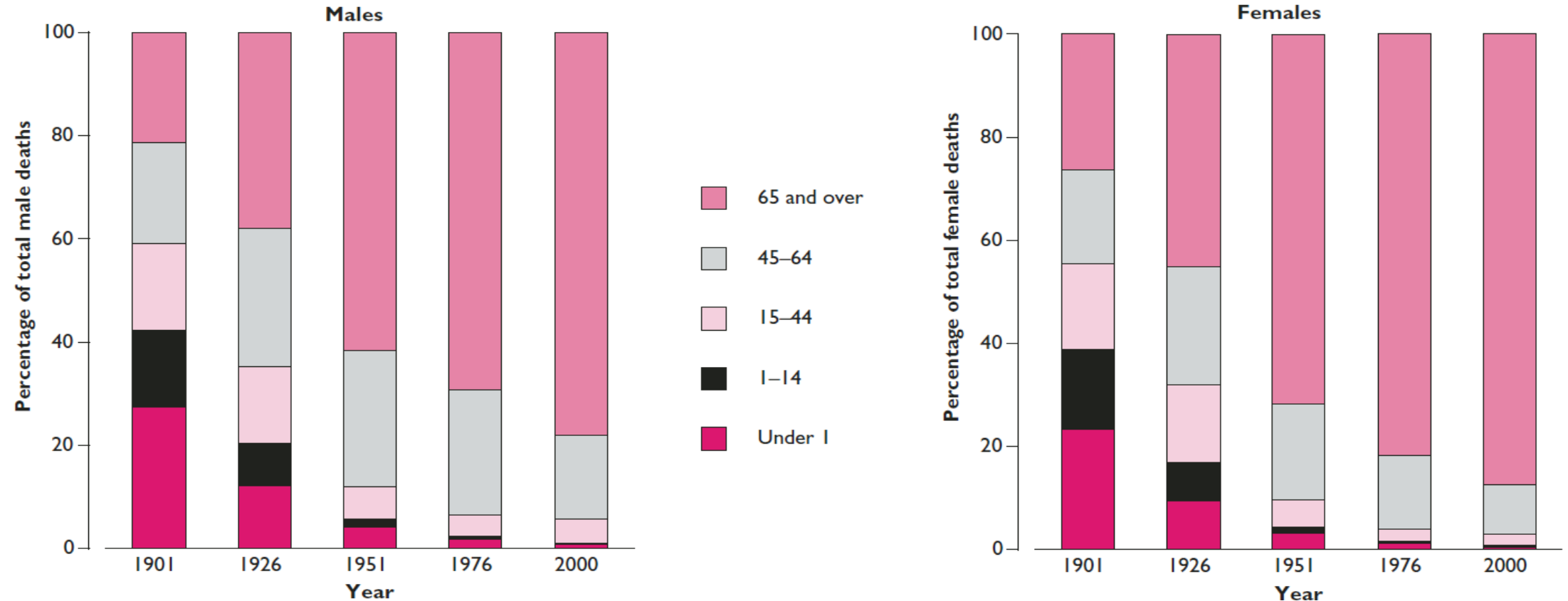


Infectious diseases: Where are we today?

Figure 2

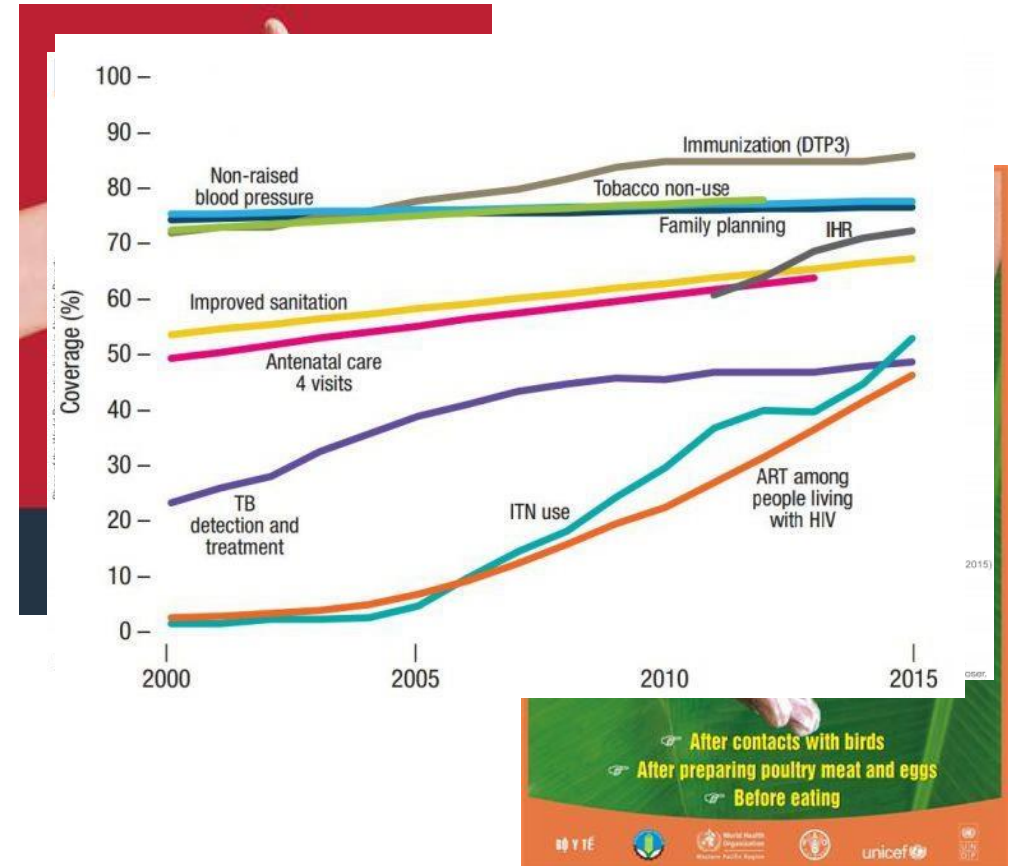
Percentage of deaths by age group, males and females, selected years

England and Wales



Infectious diseases: Where are we today?

- Overall, deaths from infectious diseases have fallen, as a result of:
 - Clean water and improved hygiene
 - Falls in poverty
 - Investment in preventative health
 - Introduction of vaccines
 - Deaths from vaccine-preventable diseases in the US have decreased from about 2 deaths per 100,000 people in 1980 to less than 1 death per 100,000 people in 2014



No cause for complacency

Infectious diseases are far from defeated

- Asian Flu in the late 1950s killed 1 million people.
- The 1968 Hong Kong Flu infected an estimated half a million people.
- The 2009 H1N1 Pandemic saw between 150,000 and half a million deaths across the world.

**SNIFFLES, SNEEZES,
STUFFY NOSE**
Common Symptoms of
**ASIAN FLU
and COLDS**

Use Mistol Mist Nasal Spray
For Quick, Comforting Help

It's wise to call your doctor at the first warning symptom of this epidemic misery. But there's one thing you can do to make yourself more comfortable when sniffles, sneezes and stuffy nose strike. Use Mistol Mist, the modern nasal spray and you'll breathe easier quickly!

It contains Neo-Synephrine*, no oil. Safe for children, too. Mistol Mist eases misery same way the doctor does when he sprays your nose. To soothe sore throat, check cough, get Mistol Cough Syrup.

*Reg. Trademark of Winthrop-Stearns, Inc.
**Get Each Member of Your Family
a Bottle of Mistol Mist**

**Mistol
MIST**
NASAL SPRAY
A Plough Product

ST. LOUIS, MO. DISP. DEC. 19 1957



No cause for complacency

Infectious diseases are far from defeated

- From 1980-1995, there was an increase in death rate due to infectious diseases - especially from HIV
- Deaths from infections transmitted by insects (vector- borne diseases) increased from 2 deaths per 10 million people in 1980 to 5 deaths per 10 million people in 2014
- Pneumonia and the flu remain to be the biggest infectious disease killers in the US, accounting for about 40% of deaths from infectious diseases

Low-income countries are disproportionately affected

- In 2010, infections still caused the majority of deaths in low-income countries
- An estimated 2.4 billion people still lack access to improved sanitation
- The burden of infectious diseases, including pneumonia, HIV, TB and malaria, remains



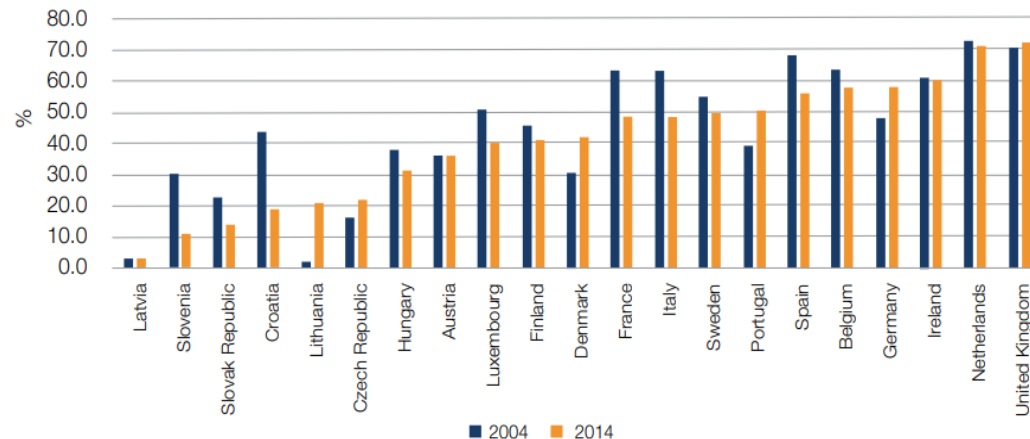
Infectious diseases: The future

Academics and policymakers are concerned about growing levels of complacency surrounding the risks of infectious diseases

What are the risk factors?

Complacency impacting on vaccination uptake

- Just over one third of older people in Europe are vaccinated against the flu, leaving the majority at risk in the case of an outbreak



Source: OECD Health Statistics 2016 and Eurostat 2016

Panic and complacency: how the world reacts to disease outbreaks



A man protects himself during the 2009 swine flu epidemic in Mexico City CREDIT: ELIANA APONTE/REUTERS

Fake news undermining consensus science

- There is a growing anti-vaccination sentiment that is limiting vaccination uptake in some places



Donald J. Trump ✓
@realDonaldTrump

Follow

Healthy young child goes to doctor, gets pumped with massive shot of many vaccines, doesn't feel good and changes - AUTISM. Many such cases!

5:35 AM - 28 Mar 2014

13,067 Retweets 11,526 Likes

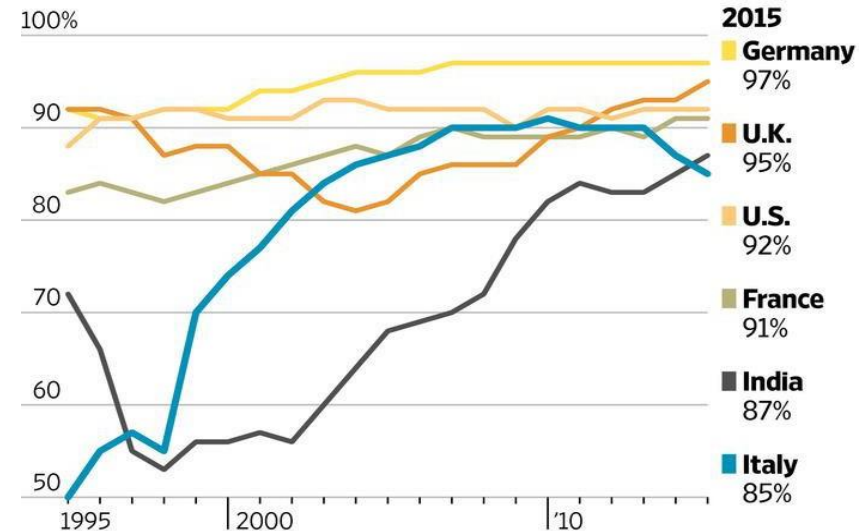


4.3K 13K 12K

Drop-off

Italy's vaccination rate has seen an especially steep fall in recent years in the face of antivaccine sentiment.

Percentage of 1-year-olds with measles immunization coverage



Source: World Health Organization

THE WALL STREET JOURNAL.

Fake news undermining consensus science

- Even governments have been complicit in the past

Unknown Disease in Spain.
(REUTER.)
LONDON, Monday Night.—Reuter's correspondent at Madrid says that **King Alfonso**, the Premier, and other Ministers, and 30 per cent of the population of Spain, are suffering from an unknown epidemic, the symptoms of which are high fever, pains in the chest, and diarrhoea. The disease is of a mild nature.

PATRIOTIC DRIVE AGAINST THE "FLU"
An onion car arrived today, Cabbage, too, they vend down there.
Labelled red, white and blue, At the Bessemer Transfer track,
"Eat onions, plenty, every day, Solid heads, three cents the pound,
And keep away the 'Flu'." Enough to supply the town.
So take a trip out Kittanning St.
And see what you can buy,
With what is left from Liberty Bonds,
Lay in your winter supply.
Eat More ONIONS
One of the Best Preventatives for Influenza.
Car Load of Onions will be on sale on siding at Bessemer Freight Station
TODAY and TOMORROW
Will Be Sold Direct from Car
Bring Your Own Sacks or Baskets if Possible
THE PRICES ARE RIGHT
J. W. GARDOCKY, Grower

RAIN KILLS ALL SPANISH 'FLU' GERMS, BELIEF
Assistant Police Surgeon Tells
How to Avoid Epidemic

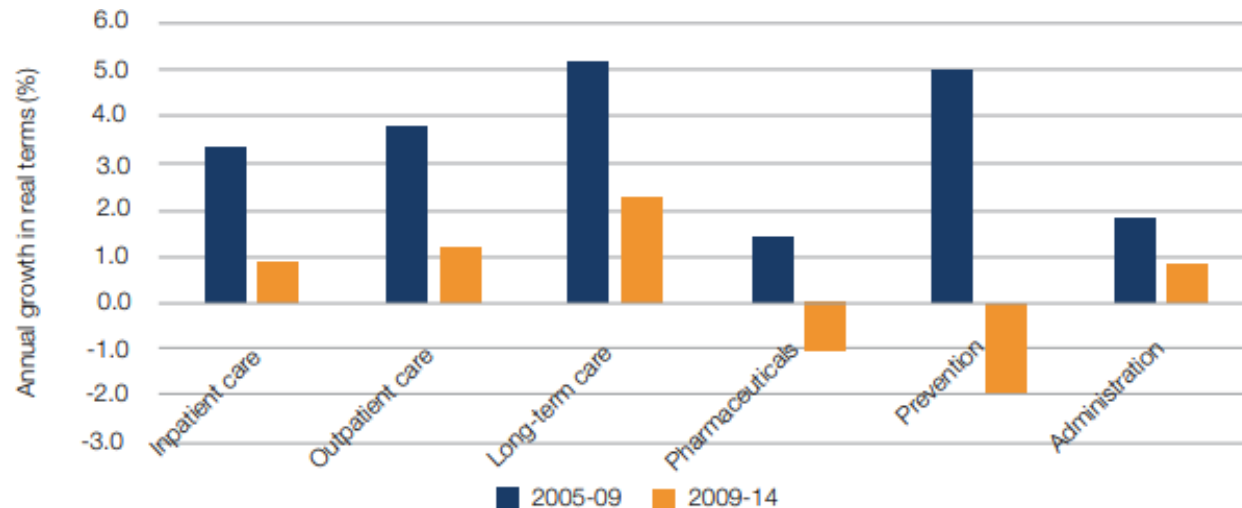
Antimicrobial resistance

- Antibiotic and antiviral resistance may reduce our ability to recover from disease
- The development of new and better antibiotics, antivirals or vaccines to combat AMR is not easy nor quick:
 - Complex production
 - Meticulous quality control
 - Need for scalability
 - Complex range of stakeholders



Austerity

- Austerity in Europe has resulted in reduced investment in preventative health across the continent
- Between 2009 and 2014, public spending on prevention fell by 2%



Source: OECD and Eurostat 2016. Data - Per head, at constant prices (2010) and constant PPPs (2010), in US dollars

Climate change

- Climate change threatens to increase the likelihood of infectious diseases
- Increasing temperature and more variable weather conditions especially threaten to undermined recent global progress against vector-bourne diseases



Urbanisation

- With 70% of people predicted to inhabit towns and cities by 2050, urbanisation could create favourable conditions for infectious diseases to spread more easily



Urbanisation

- Alternatively, urban infrastructures could help
 - Combat poverty, inequality and associated infectious diseases
 - Improve hygiene, sanitation and nutrition standards
 - Improve access to good healthcare



Migration

- An increase in global migration and travel results in a heightened risk of diseases spreading rapidly

“It is now possible for a person to travel around the globe in less time than it takes for symptoms to appear following an infection”

Professor Dame Sally Davies



No cause for complacency Infectious diseases are far from defeated

**“The world needs to
prepare for pandemics the
way the military prepares
for war”**

Bill Gates, May 2018



100 years on from the Spanish Flu

Where are we now



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What happens next



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Data, bots and drones

Can technology help increase uptake of adult immunisation?

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What happens next



Declaration of interest

ILC's work on technology and adult vaccination has been funded by a grant for ILC-UK from Sanofi



Full references in “Data, bots and drones”. Available at www.ilcuk.org.uk

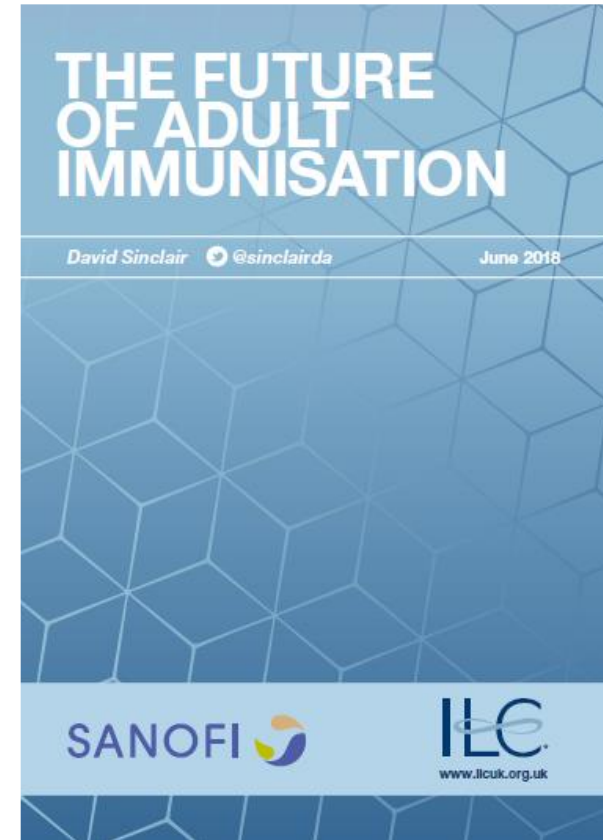
Summary

- Technology could help improve the uptake of adult vaccination
- There is no shortage of ideas as to how
- Policymakers, advocates, industry and innovators need to act if we are to maximise the potential

The Future of Adult Immunisation

2018 think piece - view the full report [here](#)

- Better use of data
- The internet
- The internet of things
- Gamification
- The sharing economy
- Artificial intelligence and robots
- Blockchain
- Materials science



June 2018 Futures Workshop (Brussels)

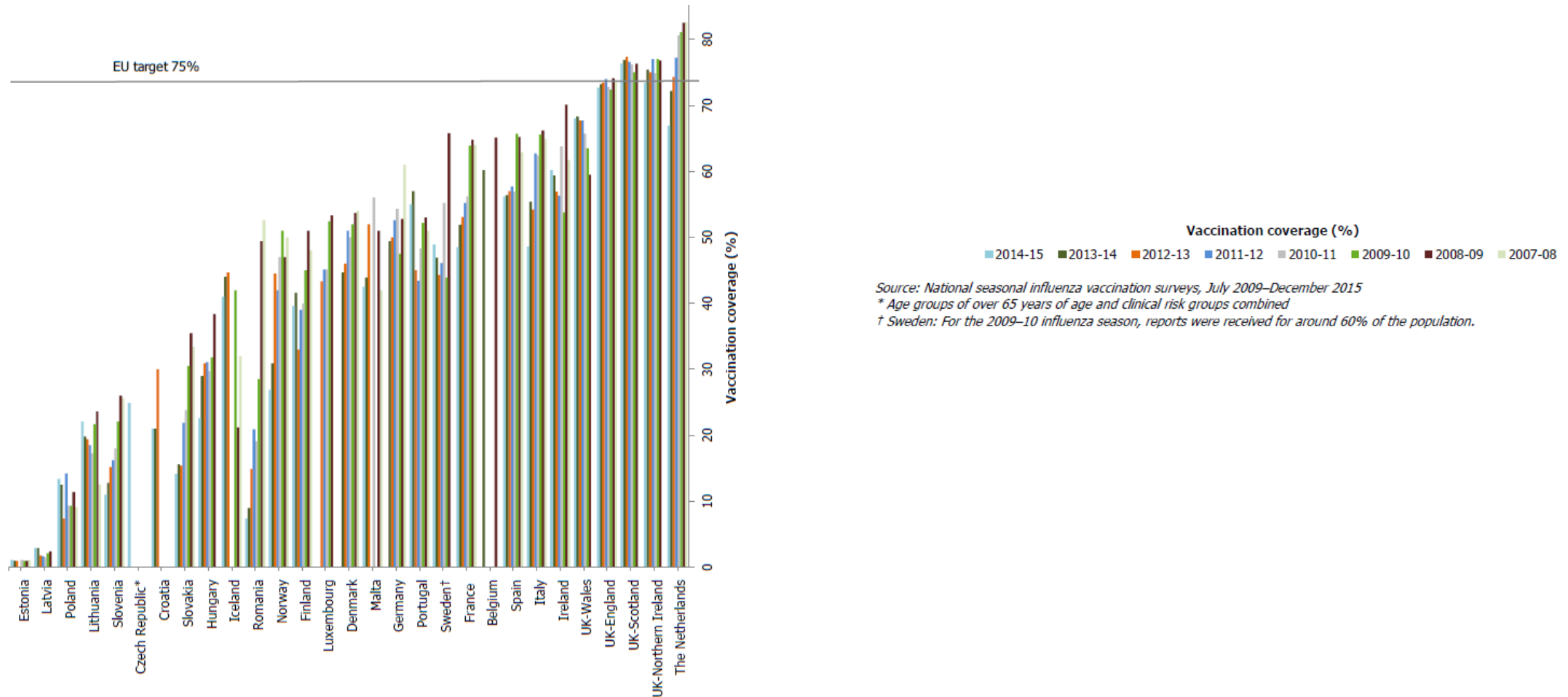
- What are the barriers to uptake of adult vaccination?
- How might technology help improve the uptake of adult vaccination?
- What might impede the use of technology here?
- What should policymakers do to ensure that we maximise the potential of new technology?

Why does adult immunisation matter?

- 40,000 and 220,000 deaths per year (EU) might be attributed to influenza infection (mostly in the 50+ demographic)
- In 2014, 17,528 confirmed cases of invasive pneumococcal disease were reported by 28 EU/EFTA countries. The age-specific incidence rate of invasive pneumococcal disease was highest in those aged over 65 years.
- The lifetime incidence of herpes zoster is estimated to be about 20 to 30% in the general population, and up to 50% among those living to at least 85 years of age.

Influenza vaccination uptake varies by country

Figure 6. Seasonal influenza vaccination coverage rates in older age groups, 29 EU/EEA Member States, 2007–08 to 2014–15 influenza seasons



Why is technology important?

“Ten or 15 years ago I could fly to New York in three and a half hours on Concorde. In the Victorian age they built a railway in five years. There is a big divergence here”.

Rory Cellan Jones, BBC



European policy context

Jean-Claude Juncker, (2017) President of the European Commission, called in his State of the Union address for action to increase coverage and ensure that everyone in the EU has access to vaccines.

Council of the EU “Vaccination is one of the most powerful and cost-effective health measures developed in the twentieth century and remains the main tool for primary prevention of communicable diseases”.

Joint action on vaccination

€5.8m investment in a Joint Action on Vaccination involving 23 countries, which held its first meeting in Paris on 4 September 2018.

This initiative aims to foster long-lasting cooperation across Europe by tackling vaccine hesitancy; ensuring sustainable vaccination policies across member states; and ensuring Europe's role in contributing to global health.

European policy context

The EU Commission's Communication on the digital transformation of health and care pledged to:

- Look at options for a common vaccination card that can be shared electronically across borders.
- Establish a European vaccination information portal by 2019 to provide online objective, transparent and updated evidence on the benefits and safety of vaccines.
- Counter online misinformation and develop online information tools to counter vaccine hesitancy.



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New WHO Recommendations (2019)

“Digital technologies provide concrete opportunities to tackle health system challenges, and thereby offer the potential to enhance the coverage and quality of health practices and services”

WHO 2019



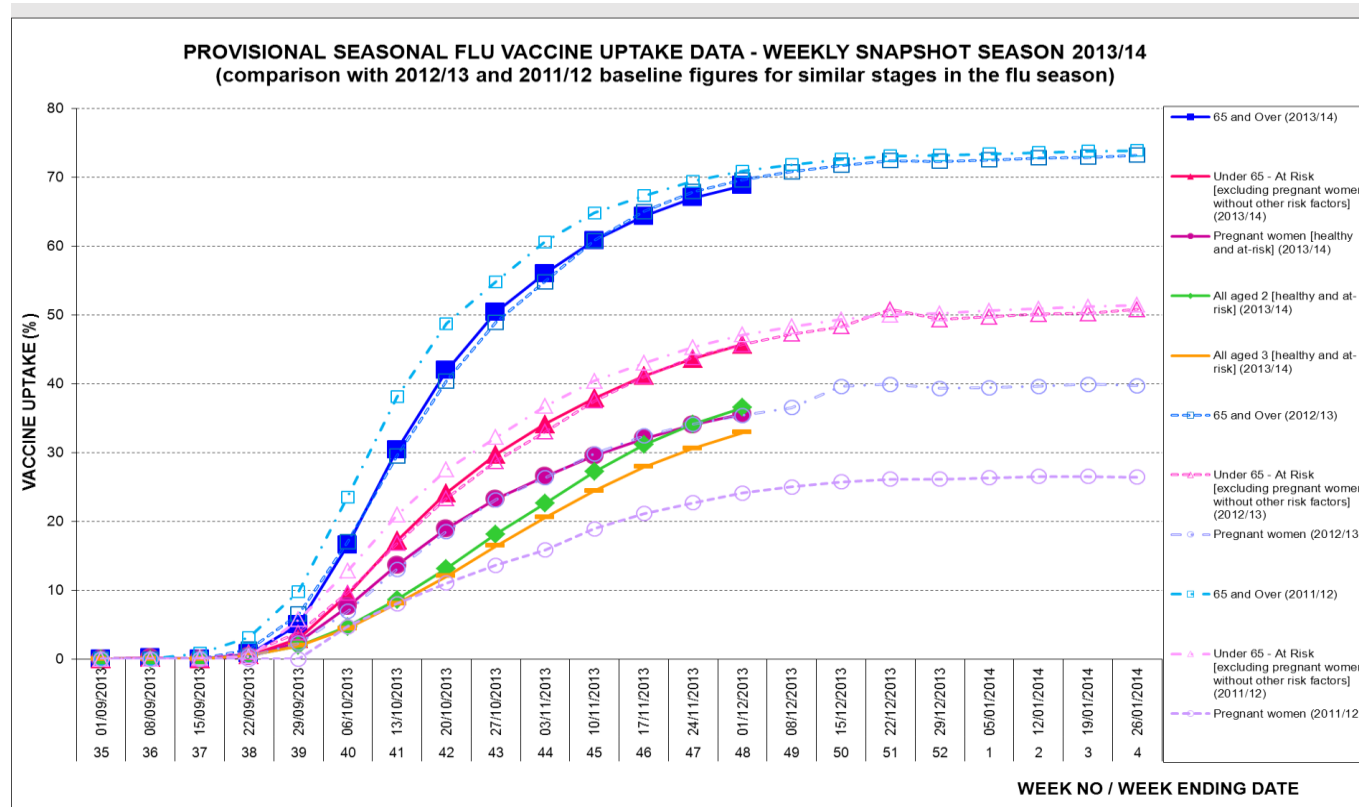
1. Using data better

Better use of data opens up possibilities for:

- better monitoring of vaccination coverage.
- better monitoring of the spread and threat of communicable diseases.
- better identification of target populations for communication.

Better monitoring of vaccination coverage

A need for good
Immunisation Information
Systems



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Better monitoring of the spread and threat of communicable diseases

- Big data has the potential to offer a much more efficient system of surveillance of vaccine-preventable diseases - for example, by using data from search engines, where a correlation has been found between search volumes and disease trends
- Disease surveillance may also benefit from systems that involve active input by users (known as participatory surveillance), using web- and smartphone-based platforms that allow users to provide information about their own health status, such as the crowdsourced influenza surveillance sites Flu Near You or Influnet.

Better identification of target population for communication

- GDPR has put EU citizens in charge of their personal data, including their health data - although at present, in practice, most citizens have limited access to data about their own health.
- A study carried out on an adult population in Australia found that use of personal health records for immunisation correlates to a higher uptake of influenza vaccination.
- Developments in on-demand printing could result in the development of personalised information leaflets for targeted groups of individuals.

Data: Ideas from our workshop

- Interactive infection maps to help people understand their risks of infection.
- Information campaigns tailored to personal data.
- Mobile technology plus location data could remind us when and where we can be vaccinated.
- An online risk-calculator would help people understand their risk of infectious diseases.

2. Using the internet

“Our first battle must be to improve trust,” said Eleanor Gentile MEP. “Every day, we are faced with more fake news and people don’t know what to believe and what to not believe. We live in a time of fear and mistrust and we must find a way to give people something they can trust. Technology might help here.”

- Tackling fake news
- Addressing the belief by some that flu is not a serious disease doesn’t help trust levels when it comes to vaccination.

ilc Increasing uptake of vaccination by healthcare professionals

What could be done?

Data Mining

- The monitoring of vaccine-confidence as reflected in internet activity might help to intercept negative trends and enable a response.

Online engagement

- Vaccine advocates need to be present and active online - not simply responding but leading the argument.

“We don’t know how to communicate health messages,” said Isabel De La Mata Barranco. “We need to explore new ways of communicating with the public, and we need new ways of presenting information.”

What is happening?

- The WHO has set up the Vaccine Safety Network to accredit vaccination websites according to certain quality criteria
- Romanian paediatrician **Dr Craiu Mihai** set up a facebook page where he posts positive messages about vaccination. The page has been liked more than 120,000 times and some of his videos have been viewed more than half a million times.
- **Roberto Burioni**, is a Professor of Microbiology and Virology from Milan. His pro-science Facebook posts can reach 3-4 million people. His page has nearly half a million likes; and he has more than 86,000 followers on twitter.

What is happening?

- **r/vaxxhappened** (<https://www.reddit.com/r/vaxxhappened/>) claims to “collect the outrageous and dangerous tales told by dim-witted anti-vaxxers on all forms of media. “We are pro-vaccination because we’re civilised. And not stupid.” The group has grown to around 90,000 subscribers.
- In Italy, the National Federation of Physicians, Surgeons and Dentists (FNOMCeO) launched a website called “**Doctor, is it true that...**” to counter fake news. Citizens can ask questions about vaccination and the answers are posted on the site, which is building up an archive of resources.
- NHS England’s **#flufighter** campaign combines online and offline material with a social media hashtag to get out messages about the value of vaccination.

Improving online communications

- 1) Walk in the shoes of the patient
- 2) Invent new communication models
- 3) Join online conversations

“Tweet accurate information and challenge #fakenews; Experiment with new tools (Snapchat and Instagram as well as facebook and youtube); Embrace networks and patient communities.”

Weis, P; Chair, ZN Consulting



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The internet - ideas from the workshop

- A vaccination-awareness day advertised on Facebook.
- An app for parents to ask questions anonymously of doctors or other specialists.
- Instagram influencers to address adult immunisation.
- Use of social media to spread good stories about vaccination.
- Social media advertisements for local pharmacies.
- An Instagram contest could showcase adults who have been vaccinated, explaining why they do so.

3. The Internet of things



Connecting our homes, cities and even ourselves to the internet will offer increasing opportunities for improving access to health services.

By 2022, 10% of the world's population will be wearing wearable devices.

Innovation in action: In India, a medical student called Richit Nagar, shocked by the statistic that half a million children die from vaccine-preventable diseases in the country each year, devised a digital necklace. The necklace is a medallion on a black thread (culturally important as a powerful symbol of protection, a reminder that technology works best when it isn't imposed randomly but when it integrates with people's lives).

The Internet of things: Ideas from the workshop

- A virtual lifelong personal assistant which would, among other things, give advice on health behaviour and remind us of the need for regular screenings.
- Wearable technology to measure our vital signs and signal when something isn't normal - or when we are in need of a vaccination.
- An ultra-violet barcode on our skin could hold our healthcare data.
- Location-based alerts could prompt people in at-risk groups when they are near a place where they can receive a vaccination.
- Siri, Alexa, Google Home etc could book vaccination appointments.
- Smart home technology could remind us to vaccinate ourselves.

4. Gamification

- Games use different and novel methods to engage people through stories, immersion, fantasy, design and gameplay that involve the imagination and the emotions as well as the intellect.
- There is emerging evidence that games can make a difference to how people feel about vaccination. A randomised controlled trial targeting parents and children in Italy explored the effect of smartphone apps incorporating gamification on knowledge about MMR and likelihood of vaccination.

Gamification



Plague Inc simulates the spread of an infectious disease; the player must attempt to control (and encourage) its spread. The Centre for Disease Control and Prevention in the US has said the game “uses a non-traditional route to raise public awareness on epidemiology, disease transmission, and diseases/pandemic information. The game creates a compelling world that engages the public on serious public health topics

An online Fake News Game from the University of Cambridge puts “players in the shoes of an aspiring propagandist, to give the public a taste of the techniques and motivations behind the spread of disinformation – potentially “inoculating” them against the influence of so-called fake news in the process

Gamification: Ideas from the workshop

- Immersive virtual reality could help people realise the impact of serious diseases.
- Gamification apps to encourage vaccination through competition.
- A VR headset game: see a doctor saving the world by getting or giving an injection.

5. The sharing economy



The sharing economy could make vaccination more accessible through shared transport services.

Sharing economy platforms could provide a community hub for the sharing of information about adult vaccination - see for example PatientsLikeMe.

Sharing platforms could provide a quick and reliable route to a qualified practitioner.

US-based healthcare transport company Circulation, leverages ride-sharing services such as Uber and Lyft to take patients to healthcare appointments.



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6. AI and robots

In some countries, there are no systems to identify at-risk individuals, or to target them.

The use of AI combined with better data offers the opportunity to speed up the process of identifying people who would benefit most urgently from vaccination and reaching them in a personalised way.

AI and robots

- “Pharmaceutical companies are increasingly embracing the potential of AI to identify drug targets, new uses for existing drugs, or to secure faster approval of medicines” - FT Sarah Neville, Financial Times, October 30, 2017
- In Vanautu, where many of the 80 or so islands that make up the nation have no airstrips or good roads, drones are now being used to deliver vaccinations.

AI and robots: Ideas from the workshop

- A robot carer could help remind when vaccinations are due.
- Bots could have conversations with people about their concerns.
- A virtual lifelong personal assistant which would, among other things, give advice on health behaviour and remind us of the need for regular screenings.

AI and robots: Ideas from the workshop

- Humanoid robots have the potential to distract patients from pain.
- An immersive experience using robots and/or virtual reality could distract and calm fears, with the potential to reduce pain and calm fears, so increasing the immune response.
- Robots can help deliver vaccinations promptly to individuals and pharmacies

Key lessons from the report:

Maximising the potential of technology

- Use of technology to improve vaccination uptake should start from the point of view of the patient, and in particular those who suffer from social inequalities that often lead to digital exclusion. The introduction of technological solutions should not exacerbate existing inequalities or create new ones.
- Big data should be much more extensively used to a) monitor disease spread, b) review vaccination coverage, and c) identify target populations for reminders and messaging.

Key lessons from the report:

Maximising the potential of technology

- There is a need to work towards greater consistency of data collection and shared platforms across countries to ensure sharing across borders, in real time, throughout Europe and globally.
- There is urgent need for government to engage with privacy issues, encourage debate, and convey to citizens the life-and-death implications of collecting and sharing information about vaccine-preventable disease.
- The internet has been used to spread fake news, and there is a need now to use the internet to counter it. This will require an imaginative, rather than purely scientific response, engaging people emotionally as well as rationally.

Key lessons from the report:

Maximising the potential of technology

- Government should support initiatives to ratify information as reliable, or penalise it for being untrue, such as the WHO's Vaccine Safety Network accreditation.
- It is not clear what emerging technologies (gamification, robotics) could be central to improving vaccination uptake, rather than interesting byways. Not all technological advances will be equally useful. There is a need to invest in emerging technologies while at the same time taking a rigorous approach to effectiveness.

European Policymakers should...

- **Deliver a policy framework that will support innovation**
- **Regulate to support innovation**
- **Take a lifecourse approach to vaccination**

Deliver a policy framework that will support innovation

- Develop a specific funding programme on “what works” to ensure that policy and financial investment in technology delivers its potential
- Ensure that Europe has a research environment and capacity that helps it to lead the world in innovation. This requires investment in skills, as well as direct funding of research
- Support innovation that focuses on those most in need and attempts to reduce rather than enlarge inequalities.

Regulate to support innovation

- Legislate to ensure that products and services are accessible and usable for all ages and abilities.
- Ensure Innovation isn't hindered by data protection rules or other regulation whilst supporting a move towards individual ownership of data
- Use regulation to improve trust in data-use for better health outcomes, including regulating to ensure ownership of data by the individual

Take a lifecourse approach to vaccination

- Recognise the challenges of demographic change and ageing populations and ensure policy supports vaccination as important across our lives. Develop an EU wide programme of action to encourage uptake of adult as well as child immunisation.
- Focus policy attention on adults in at-risk groups as well as older people
- Support growing financial investment in the prevention of ill health across our lives

Summary

- Technology could help improve the uptake of adult vaccination
- There is no shortage of ideas as to how
- Policymakers, advocates, industry and innovators need to act if we are to maximise the potential



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What happens next



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Thank you for listening!
Questions?

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INTERNATIONAL FEDERATION ON AGEING
15TH GLOBAL CONFERENCE
NIAGARA FALLS, CANADA | 1-3 NOVEMBER 2020

Pre-Conference Summit | 31 October 2020

Informing the global agenda for a life course approach to adult vaccination through a one-day Vaccines4Life Summit with focus on:

- Understanding the public impact of vaccine preventable diseases
- Inspiring change through examples of good practice from around the world
- Galvanising action through targeted communication strategies

Register for the conference at ifa2020.org