Monitoring of Public Health Threats in Social Media

Joint Research Centre (JRC) of the European Commission
Text and Data Mining, Unit I.3

Jens Linge
What do we currently cover in EIOS?

News media in 50+ languages
Ministries of Health / Public Health Agencies
GPHIN, ProMED, HealthMap, RSOE, CIDRAP
Email alerts

=> 300,000 items per day from > 28,000 feeds
Social Media – What do we expect?

Trending topics, e.g.

#VeteransDay

'Uranium particles detected at site in Iran'

Early alerting, e.g.

'Been sick all day... #foodpoisoning 😥😭'

Follow known accounts / hashtags, e.g.

@WHO #HPV
Search trends, e.g.
'vaccinations for children' / 'Do vaccines...'

Search results / Autoplay
Which results do our searches return?
Which other results are featured / blacklisted?

Network analysis, i.e. who is posting content?
friends, bots, paid trolls

Advertisement on social media
origin, number, content & targeting of ads, $$$
Example vaccination hesitancy

Twitter (enterprise API, decahose, kibana)
Google Trends (jupyter)

facebook
instagram
youtube
whatsapp
Metro Atlanta middle school student diagnosed with measles, officials say: https://t.co/ovOEK0qz6. @tammegarWSB is learning more about the diagnosis. // on Channel 2 // https://t.co/OD47YtjL8

Measles case confirmed in metro Atlanta, health department says.

State health officials have confirmed a case of the measles in metro Atlanta. The Georgia Department of Public Health said the case is someone who was unvaccinated in Cobb County.
In [7]:
plt.figure(figsize=(500/my_dpi, 500/my_dpi), dpi=my_dpi)
data.Stance.value_counts().plot.pie(rot=0, subplots=True, fontsize=0, sort_columns=True,
plt.legend(labels=data.language.tolist())
plt.style.use('seaborn-pastel')
plt.legend(loc='center left', bbox_to_anchor=(1, 0.5), prop={'size': 14})
plt.rcParams['figure.facecolor'] = 'None'
print(data.Stance.value_counts())

P  6735
A  3002
U  263
Name: Stance, dtype: int64

Stance distribution
Health Secretary Matt Hancock won't rule out BANNING unvaccinated children from schools

The UK’s chief medical officer – the top advisor to the Government – last year ordered people spreading lies about vaccines being unsafe. Dame Sally Davies, speaking on the 50th anniversary of the MMR (measles, mumps and rubella) jab, said people spreading the myths were “recklessly wrong.”

Se cuadruplican los casos de sarampión en el mundo

En el mundo se cuadruplicaron durante los tres primeros meses de este año, en relación al mismo periodo del año pasado, acaso de advertir a la Organización Mundial de la Salud (OMS), que precisó que en Africa el aumento fue de 700 por ciento. “Hasta de hoy, en el 2019, 174 países han informado de 112.

Report: No-deal Brexit could leave UK with medical shortages

LONDON (AFP) — Britain’s government watchdog says there’s still a “significant amount” of work to do to make sure the country has an adequate supply of licensed drugs in case of a no-deal Brexit. In a report issued Friday, Britain’s National Audit Office said additional importing capacity was underutilized.

North Korea said its mass vaccination programme had prevented the spread of measles.

Vaccination opponents go viral in communities battling measles

MORSEY, Ill. — In a suburban shopping center at hour north of New York City, hundreds of mostly ultra-Orthodox Jews gathered in a semi-circular formation to hear lectures of the national anti-vaccine movement.\n
Alex Azar praises Trump for public shift on vaccines

Asked whether President Donald Trump’s earlier comments might have spread the wrong idea about vaccines, HHS Secretary Alex Azar said, “I don’t know if the exact words he used but it’s been well-told.” John Shiffman/POLITICO. HHS Secretary Alex Azar said today that a measles outbreak had affected as least...\n
Those who missed MMR vaccine should see GP, says Public Health England

Anyone who has not been vaccinated or has a child who missed a dose of the MMR vaccine should see their GP about catching up in the light of widespread measles outbreaks in Europe. Public Health England is warning that is particularly concerned about families and students who are Italy...
Antivax on google trends
Concrete Steps for EIOS

Twitter access (UN Firehose, developer account for public API, login on client side)

Follow known Twitter accounts and hashtags

Integration in EIOS frontend

Kibana and jupyter tools based on elastic search and Apache SOLR
Joint Research Centre (JRC)

www.jrc.ec.europa.eu

Jens Linge
Text and Data Mining Unit

http://medisys.newsbrief.eu
http://emm.newsbrief.eu

Serving society
Stimulating innovation
Supporting legislation
What to watch as impeachment inquiry of Trump goes public

WASHINGTON House Democrats are giving President Donald Trump a reality show for the ages as they take his case public for his impeachment. But the proceedings are much more than showbiz, with lawmakers considering the use of a grave and seldom-employed power spelled out in the Constitution.

Report predicts drug resistance likely to kill nearly 400K Canadians by 2050

VANCOUVER—Superbugs are likely to kill nearly 400,000 Canadians and cost the economy about $400 billion in gross domestic product over the next 30 years, warns a landmark report. An expert panel cautions in “When Antibiotics Fail” The growing cost of antimicrobial
Harry to meet Gareth Thomas to highlight importance of HIV tests

The Duke of Sussex will team up with former Wales rugby star Gareth Thomas to highlight the importance of being tested for the HIV virus. Harry and Thomas, who has HIV, will meet players from the King’s Cross Steelers, who style themselves as the world’s first gay rugby club, and others from....

New HIV subtype discovered, first since 2000:

Researchers have discovered a new subtype of the human immunodeficiency virus (HIV) called HIV-1 Group M, subtype L which is the first time a subtype of HIV has been found in almost two decades. The researchers from the multinational pharmaceutical company Abbott used a tailored method of the....
Latest News About - Ebola Hemorrhagic Fever

Top Stories

EU Approval of First Ebola Vaccine is Game Changer

Latest articles

Reuters Health News Summary

Following is a summary of current health news briefs. Solid Biosciences shares plummet as gene therapy trial halted again. Shares in Solid Biosciences Inc plunged 71% on Tuesday after a trial testing its gene therapy for a muscle-wasting disorder was halted for the second time in less than two years.

Articles published more than 10 minutes ago

Russia will continue working with DRC to defeat Ebola epidemic — foreign ministry

*Xanthomonas* *spp.* *Citrus Canker*: APHIS Adds Portions of Brazoria, Fort Bend, and Harris Counties in Texas to the Domestic Quarantine Area (US)

nappo [fr] [de] 23-Sep.2019

Effective immediately, the Animal and Plant Health Inspection Service (APHIS) is expanding the area quarantined for citrus canker in Texas to include portions of Brazoria and Harris Counties in and near Pearland and additional portions of Fort Bend and Harris Counties in and near Richmond to prevent the spread of the disease. (more)


- *Ceratocystis platani*

*Le champignon tueur de platanes est arrivé en Ile-de-France*
The plane tree killer fungus has arrived in Ile-de-France

leparisien [en] [de] 22-Sep.2019

Il a été repéré cet été. « En juillet, nos services ont constaté des symptômes inquiétants sur une dizaine d'arbres âgés de 30 à 40 ans à Antony, détaille Christian Lemoing, directeur des parcs et jardins au conseil départemental des Hauts-de-Seine. En plein été, ils avaient perdu l'ensemble de leurs feuilles ». (more)

It was spotted this summer. "In July, our services noticed worrying symptoms on about ten trees aged 30 to 40 in Antony," explains Christian Lemoing, director of parks and gardens at the Hauts-de-Seine departmental council. In the middle of summer, they had lost all their leaves".
Food Fraud Cases

French authorities have investigated a case of fraudulent increase of the weight of chicken meat with water. The meat, which came from Denmark, was sold to associations that provided meat to people with low income. This type of fraud is not harmful to consumers’ health but affects their budget.

[France 3-regions: 10/09/19](#)

About 40% of meat sold as lamb in Burgos, Spain, is likely from other countries although the animals are slaughtered in Burgos, according to the association Asaja.

[Diario de Burgos: 12/09/19](#)

According to European legislation, brandy can only be produced by distillation of wine. A Spanish company established in Georgia exported to France and Spain around 4 million litres of false brandy obtained from maize.

[El Mundo: 16/09/19](#)

Spanish Guardia Civil have arrested a producer of Rueda PDO wine for marketing thousands of bottles with false labels.

[Agropopular: 16/09/19](#)
Instagram blocks some hashtags

Some restrictions were imposed (May 2019):
#VaccinesCauseAIDS
#vaccinescauseautism
#vaccineskill

Still allowed:
#antivaxx
#antivaxxer
#antivaxxers
#proudmom
Twitter announcements

*Twitter shows official vaccine information in search results (May 2019):*

**Know the facts**

To make sure you get the best information on vaccinations, resources are available from the US Department of Health & Human Services.

Visit vaccines.gov

@HHSGov
Underlying issues

Conflic of interest (controversial/extreme content receives more clicks => $$)

Youtube’s recommendation algorithm (autoplay) leads users gradually to controversial/extreme content, e.g.

- from jogging videos to ultramarathon races
- from vegetarian cooking recipes via veganism to animal rights activism

Bots and Trolls
Bots and Trolls

Weaponized Health Communication: Twitter Bots and Russian Trolls Amplify the Vaccine Debate

- Bots disseminate antivaccine messages.
- Trolls promote discord.
- “Accounts masquerading as legitimate users create false equivalency, eroding public consensus on vaccination.”
InThisTogether @InThisTogether · 20h
We are told that there is no scientific reason to question #Vaccines and that anyone who questions vaccine efficacy or safety is an #antivaxxer. However there is a more to the debate than simply flinging insults at each other.

in-this-together.com/vaccines-part-...
Antivaxx in politics

The rise of populism across Europe correlates with the level of mistrust concerning vaccines.

“Vaccine hesitancy and political populism are driven by similar dynamics: a profound distrust in elites and experts.”

Healthy young child goes to doctor, gets pumped with massive shot of many vaccines, doesn't feel good and changes - AUTISM. Many such cases!
7:35 AM - 28 Mar 2014

7,614 replies 5,398 likes
Vaccine disinformation 'one of the top 10 public health threats'  
Every second EU citizen concerned about vaccine side effects

by József Barna, CEND
02/05/2019 | 57, 70

European citizens generally believe in the effectiveness of vaccines, but there are still a lot of myths to debunk around vaccination. These are some of the findings of a recent Eurobarometer survey published on the occasion of the European Immunisation Week, which ended this Tuesday.

Today, more than 100 million children are vaccinated around the world every year against diseases such as diphtheria, tetanus, tuberculosis, polio, measles and hepatitis B. Vaccination has increased the chances for each child to reach adulthood and for each fully vaccinated adult to maintain good health and wellbeing. It prevents an estimated 2.5 million deaths worldwide each year and reduces disease-specific treatment costs.

Despite this fantastic track record, several EU and neighbouring countries are currently facing unprecedented outbreaks of vaccine-preventable diseases due to insufficient vaccination coverage rates. Unequal access to vaccines and the waning of public confidence in vaccination are a cause for concern and a major challenge for public health experts.
"Vaccine-preventable diseases"? I love when that gets thrown around. You do know that even the manufacturer of these INFECTIONS as a "disease" infers more of an "incurable illness"... Measles and chickenpox and the Mumps have always been considered ordinary childhood infections involving a bit of a rash and a temperature for a few days and afterwards we were all right as rain and nobody had ever referred to them as "life-threatening". As a matter of fact, it was MERCK (the MMR vaccine maker I believe) who started all this fear mongering upon the creation of their measles vaccine in 1953. Ask anyone who is at least 40 and older, these infections were all considered a kind of "rite of passage" and were ONLY ever "life-threatening" at the beginning of the century due to poor nutrition and bad sanitary conditions. There have been ZERO deaths due to these most common childhood infections in the past +/- 20 years and when they try to point to something like "1 death in the US" back 14 odd years ago, you will quickly find that the deceased was a person who had ALSO been suffering from an immunocompromised disorder - usually caused by chemo, a pharmaceutical known to be derived from Mustard Gas discovered during WWI. You can't even make that up btw - it's right on the page of the American Cancer Society - but I digress.... So, no deaths caused by these ordinary infections in the developed world. Yes they still do cause deaths in the 3rd world but then so does the common cold due to the fact that those poor people are under-nourished and live in totally unsanitary conditions with little access to clean water - obviously not the case here in Europe thankfully. Btw, and you might have worked in health services but it is a rather well-known fact that even ordinary medical doctors are never actually taught about Immunology and all too often have not the slightest clue what vaccines actually contain! Therefore my question to you: do YOU know what they contain?
Linked content

In provaccine tweets, Twitter (12.9%), content curator Trap.it (3.4%), and the Centers for Disease Control and Prevention (1.9%) ranked as the top 3 domains.

In antivaccine tweets, social media links were common: Twitter (14.9%), YouTube (8.4%), and Facebook (3.4%).

**Tweet list**

Oct 17, 2016 @15:50:24:00 @SavingFace411

67

Ineffective flu vaccine contributed to 50,000 extra deaths last winter. https://t.co/LmIfU0EskN

Oct 16, 2016 @15:50:24:00 @nikiobstret15

1,750

L’APIA disponia il ritiro di alcuni loti di Omprazolo della Sandoz, farmaco generico utilizzato come anti-ulcera, a seguito di segnalazione della stessa ditta produttrice per presenza di precipitato. Fortunatamente sono i vaccini i soli farmaci alci... https://t.co/0P98gCuP2P

Oct 16, 2016 @15:50:25:00 @FragmatistProf

685

I went to the doctor and had to pay $110 for a TDAP vaccine. When people have to pay over a hundred dollars for a vaccine your healthcare system is fucking broken.

Oct 16, 2016 @15:50:24:00 @saralrochab

175

@shainasart O pânico delle me fazendo Eia me chamou pra tomar vacina com ela! Como se a menina tivesse pedido ele em casamento

Oct 16, 2016 @15:50:22:00 @msbazzic

644

This new vaccine successfully killed a patient's cancer cells @MayoClinic @cancer @CancerResearch @CancerAwareness @BRMaReto @WfKHeath https://t.co/9kOFyYyAK

Oct 16, 2016 @15:50:21:00 @TheAustismSage

2,702

I know how it feels when you watch other children do things your child may never be able to do, and the envy builds. I know the guilt that comes when you find yourself wishing that disability had chosen another home than yours to inhabit. I've felt it too. https://t.co/6GFuWnjYH

Oct 16, 2016 @15:50:18:00 @vignagopi1960

92

Facebook post encourages blue Halloween buckets to raise autism awareness. https://t.co/ThMGQ0N6tT

Oct 16, 2016 @15:50:17:00 @AT_Autism

1,971

@DNRMunro @Cln, Holoway Compare &amp; contrast to the world-leading collaboration from autistic speakers led by DJ VanPoppeloo and this month at OAFNCCF, looking at CV and MH, for example. Working with autistic colleagues and allies at every level. Share with @AT_Autism and other leading organisations.

**Shared articles**

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<td>@TonyGriswold</td>
<td><img src="image" alt="User Profile" /></td>
<td><a href="https://www.youtube.com/watch?v=156F9vZ8mUALfeature=youtu.be">https://www.youtube.com/watch?v=156F9vZ8mUALfeature=youtu.be</a></td>
<td>John P. Hussman Institute for Human Genomics</td>
<td>Genetics and Diversity: Focusing the Lens on Ancestry. The John P. Hussman Institute for Human Genomics and the Dr. John T. Macdonald Foundation Department...</td>
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<td>Oct 16, 2016 @15:50:39:00</td>
<td>@midmainef</td>
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<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Oct 16, 2016 @15:50:26:00</td>
<td>@CalleaBlog</td>
<td><img src="image" alt="User Profile" /></td>
<td><a href="https://www.khan.com/news/local-news/search-for-missing-teen-with-autism-continues">https://www.khan.com/news/local-news/search-for-missing-teen-with-autism-continues</a></td>
<td>Search for missing teen with autism</td>
<td>We're following breaking news we first brought you last night, an 18-year-old with autism remains missing this morning after a full day of searching.</td>
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</tr>
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</table>
Bebê de 3 meses com doença rara precisa de remédio de R$ 2 milhões (José Brito/Folha de Pernambuco)


Raw meat pet food may contain bacteria harmful to humans

Increasingly popular raw meat meals for dogs and cats may be full of multi-drug resistant bacteria, posing a serious risk to animals and humans, scientists reported on Wednesday. Pet dogs compete during the race session of a pet dog competition in San Francisco, the United States, on Sept. 14, 2019.

Conference report: Protein pellet to broaden in coming years

How can we guarantee food for a growing population? The Seaboard Innovation Day was dedicated to answering this question. At first glance, the growing demand for protein means great business for the poultry industry, but in reality there is a need to 1. blend the assets in which to live decreasing and 2.

End-to-end' courier service to ensure medicines in no-deal Brexit

Health Secretary Matt Hancock said: “This dedicated delivery service will get urgent supplies and short shelf-life medicines, like antibiotics for cancer treatments, rapidly into the country, including by plane where necessary. “It is just one element of our detailed and robust preparations for…

BBC 100 Women 2019: qui est sur la liste?

1) Precious Adams - Danseuse de ballet, Tchad-Unies. Àgée de 19 ans, Precious Adams passe la vie à danser dans la salon familiale. À chaque fois qu'elle arrive à danser au salon, elle est toujours à réciter des poèmes et de beaux écrivains de la musique.
Percentage of US adults who get their news from social media

Source: PEW Research Center, 2018