Gouverner en temps de pandémie: la grippe espagnole (1918-20)

Besturen in tijden van pandemie: De Spaanse Griep (1918-20)

Prof. Isabelle Devos (UGent)

Prof. Sophie Vanwambeke (UCL)

20 avril 2021

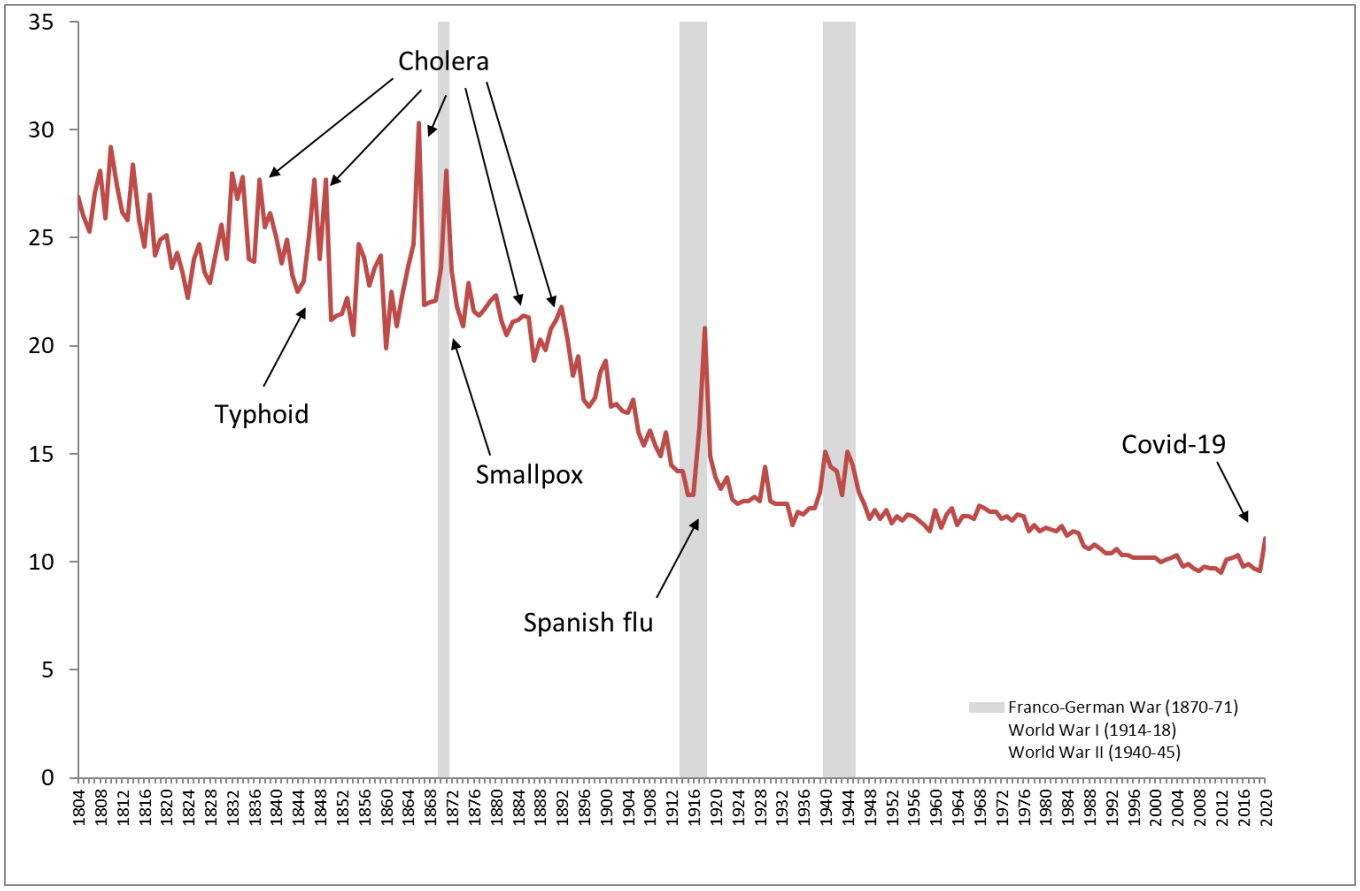
1. The Spanish flu in Belgium

Isabelle Devos
History Department & Quetelet Center
Universiteit Gent

Source: Royal Library Belgium, Postcard 1918

UNIVERSITEIT GENT

Context



Crude death rate (deaths per 1000 inhabitants) in Belgium, 1804-2020

- Mortality decline
- World War I
- Epidemiological transition (from infectious to degenerative diseases)

What do we know?

- World War I: Sophie De Schaepdrijver '*De Groote Oorlog*', Pieter Serrien '*Het Elfde Uur*', etc.
- MA theses on Spanish flu: Benjamin Brulard UCL 2018 (epidemiology and perception), Laurence Hendrickx UAntwerpen 2017 (press), Saartje De Smet UGent 2008 (parish registers)
- Local studies on Spanish flu: Ostend (François & Mahieu 2020), Zwin region (De Meester & Huys 2019), etc.

- International studies: few references on Belgium

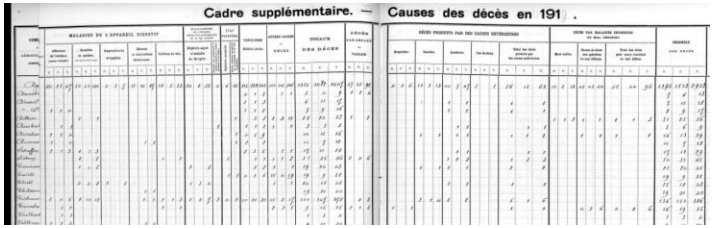
→ Limited knowledge

Why?

Quantative and quantifiable sources on mortality

Aggregate municipal level

- Mouvement de l'Etat Civil et de la Population (ARA): only partial data for 1918, better data for 1919



Individual municipal level

- Death certificates (ARA): embargo 100 years (only recently changed to 50 years)
- Parish registers (mostly locally preserved ; thesis De Smet)
- Cause-of-death registers (mostly local archives): only a handful perserved (medical privacy)
- Hospital patient records (few preserved)

Qualitative sources:

Medical reports

- Académie Royale de Médecine de Belgique: no bulletin
- Army: Archives médicales belges (Nolf et al. 1919)

Governmental measures

- Minutes of ministerial council: -
- Reports of proceedings of the chamber of deputies: -
- Reports of prov. and local council (Gemeentebladen): incomplete for many municipalities in 1918

Perception

- Newspapers (thesis Hendrickx)
- War diaries (thesis Brulard)

- Incomplete sources
- War time
- Practical issues (< 100 y.)

How many died?


De Standaard Meest recent Corona Binnenland Buitenland Opinie Economie Cultuur Sport Meer

SPAANSE GRIEP KOSTTE HET LEVEN AAN 282.165 BELGEN

De 'moeder aller pandemieën' die onder de mat geveegd werd

Bij het einde van de Eerste Wereldoorlog stierven bijna 300.000 Belgen aan de Spaanse griep, veroorzaakt door het H1N1-virus. Deze verre voorloper van het nieuwe coronavirus verdween samen met zijn slachtoffers in de geschiedenis.

Source: De Standaard, 20 april 2020.

Estimates

- De Standaard: 285.165 deaths
- Contemporary estimates: 20.000 deaths

→ Murray et al. (*The Lancet*, 2006):

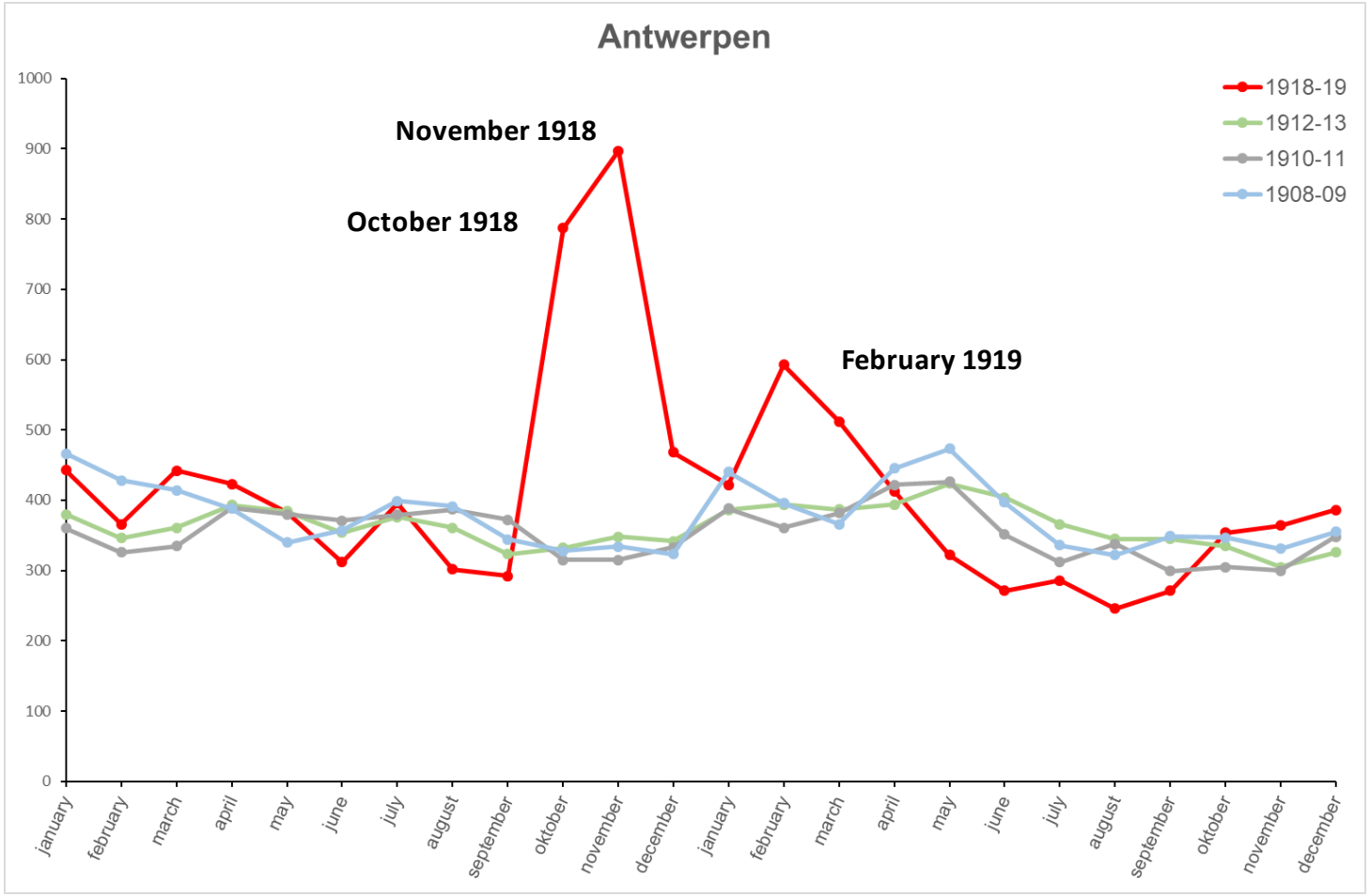
0,83% excess deaths per 100 people (ca. 62.000 deaths)

→ Reasonable estimation: **30.000-80.000 deaths** (pop. of 7,4 million)

Based on figures for excess mortality compared to 1910-13

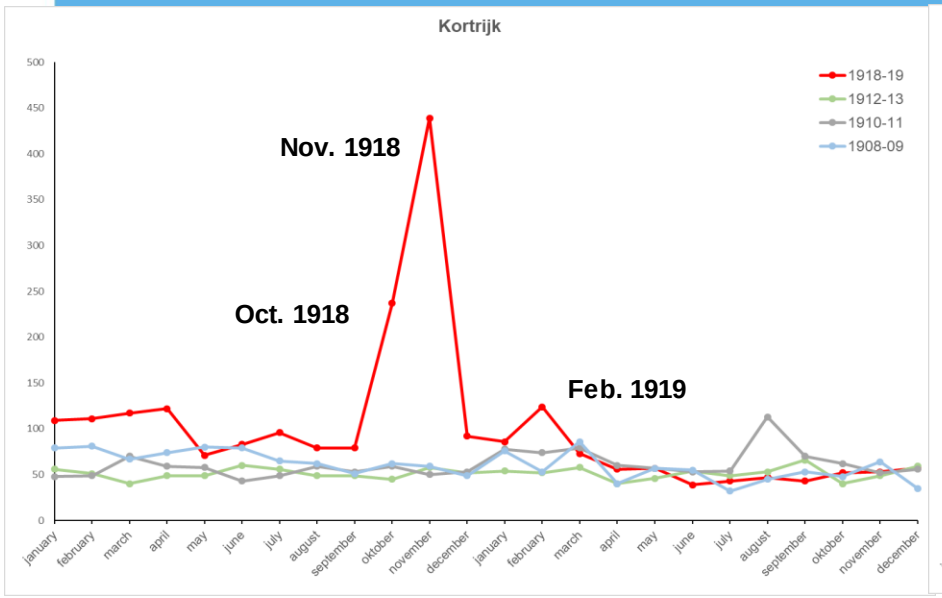
& taking into account quality of registration

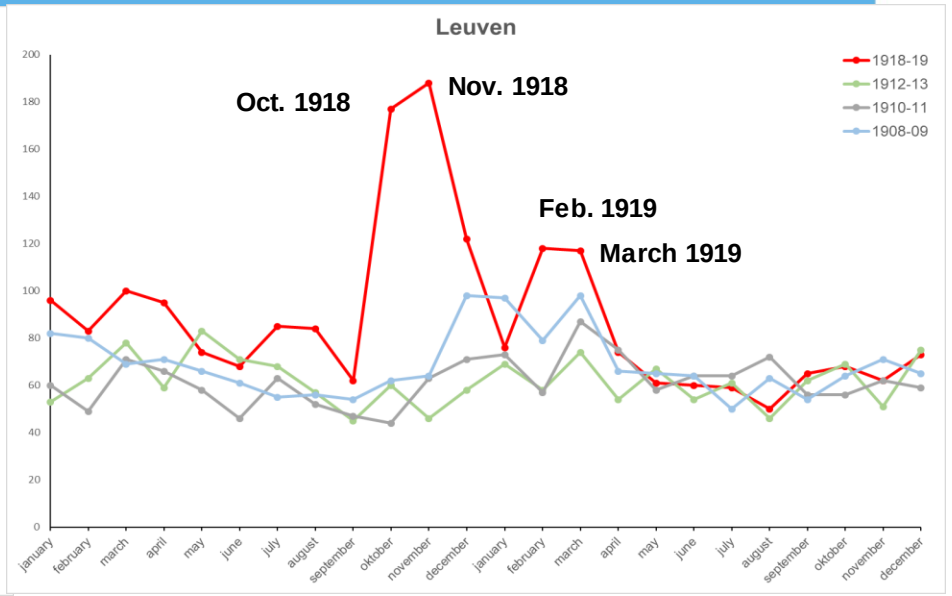
When?

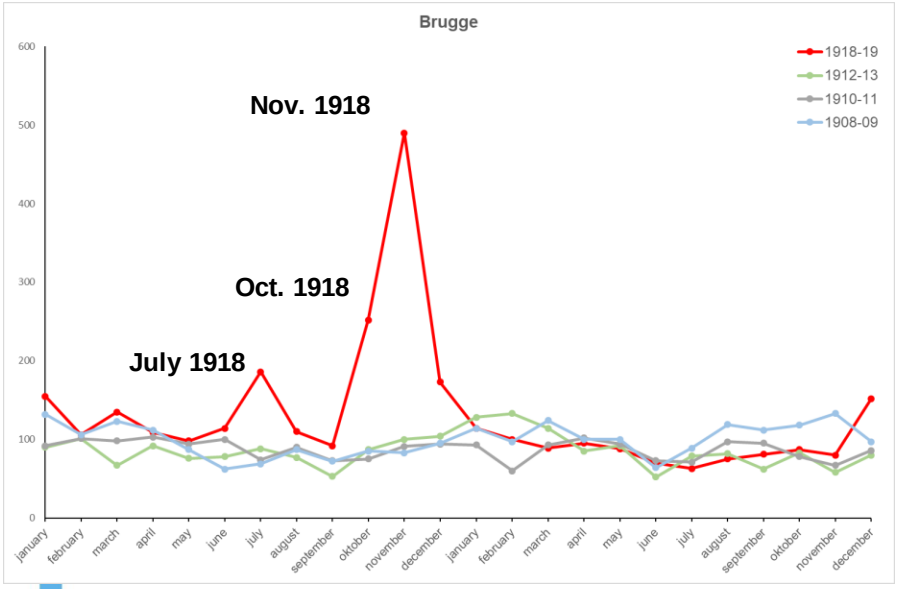


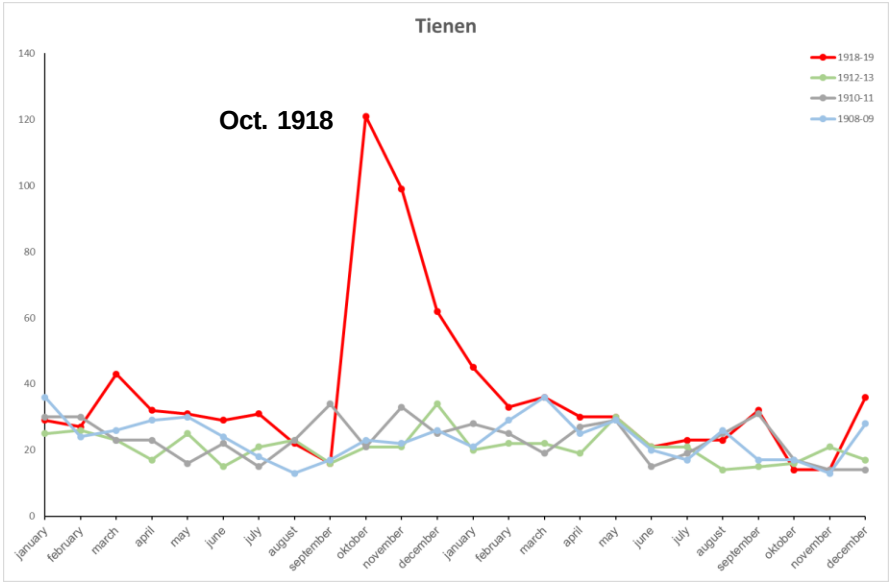
Number of deaths per month

Source: ARA, Death certificates 1918-19

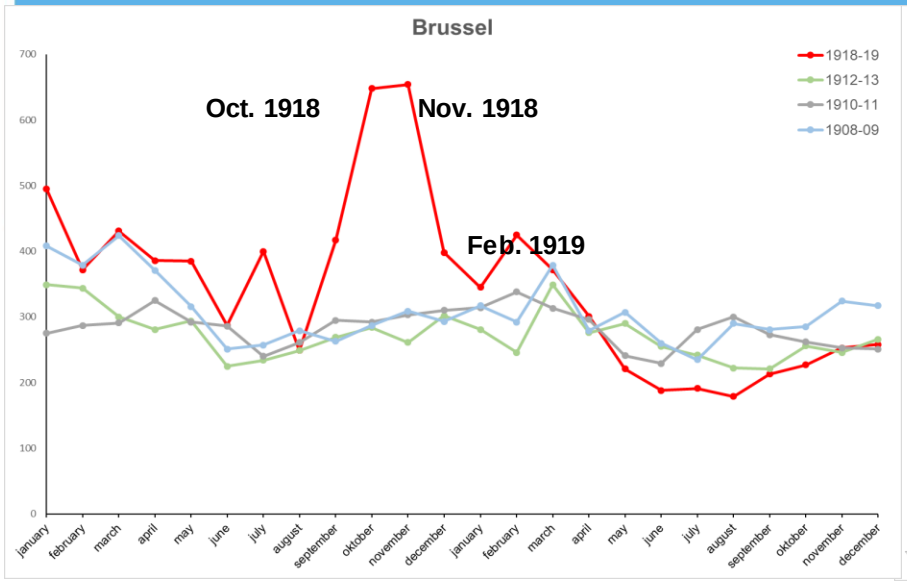


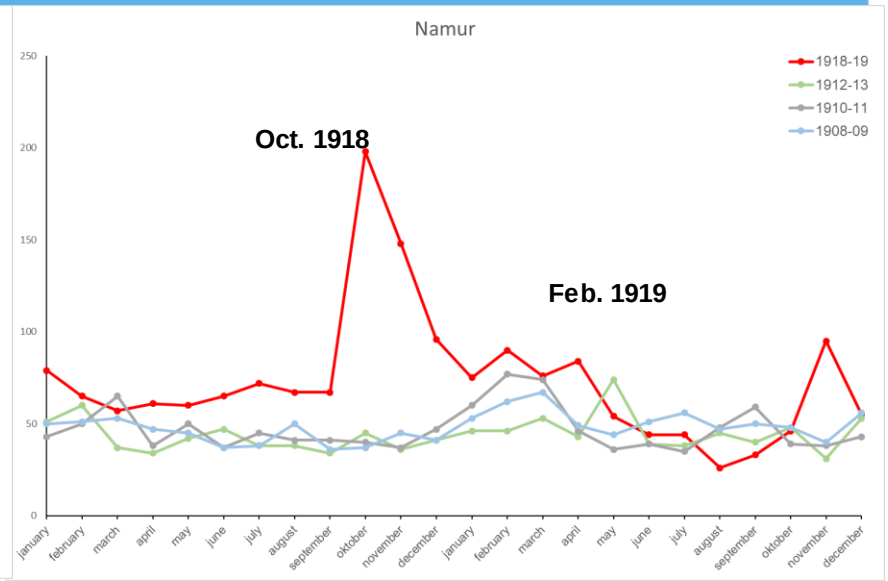


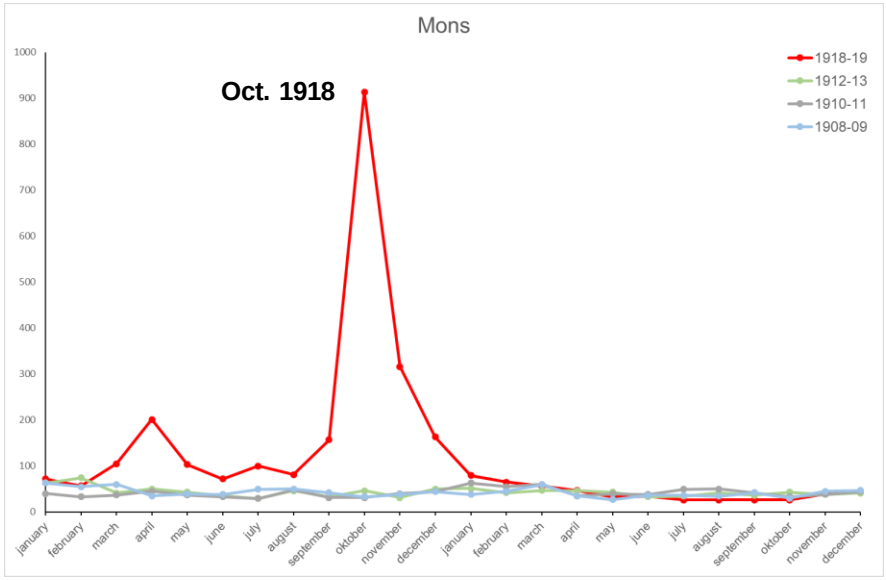


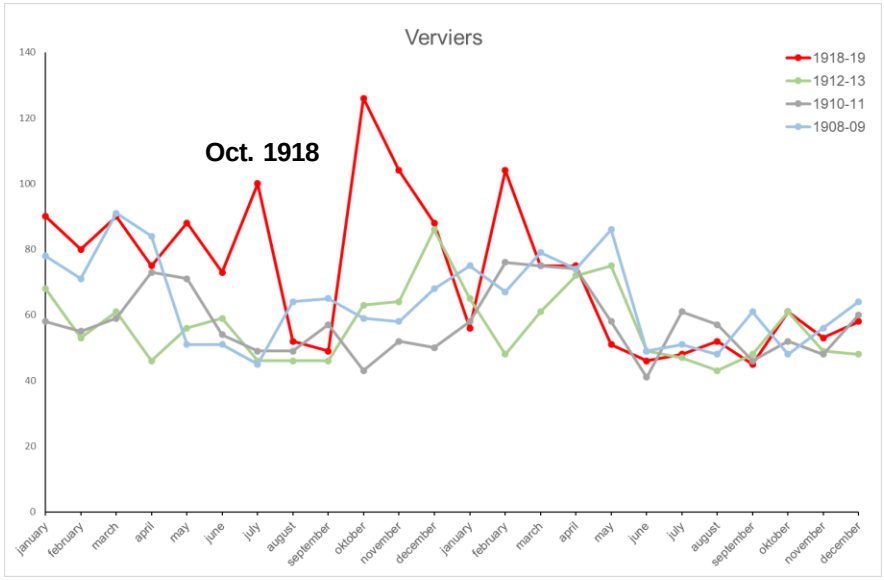


Three waves: spring 1918; oct-nov. 1918; early 1919



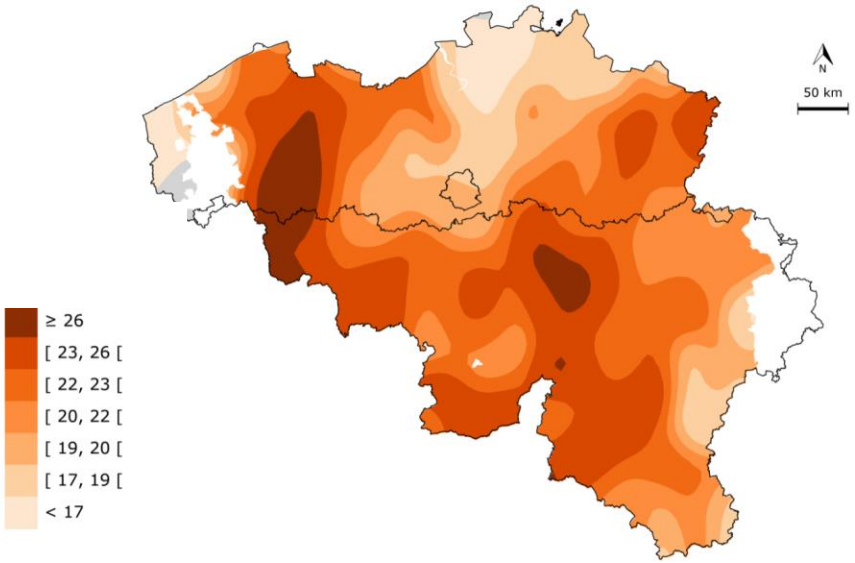






Mutation of virus; army troops and liberation

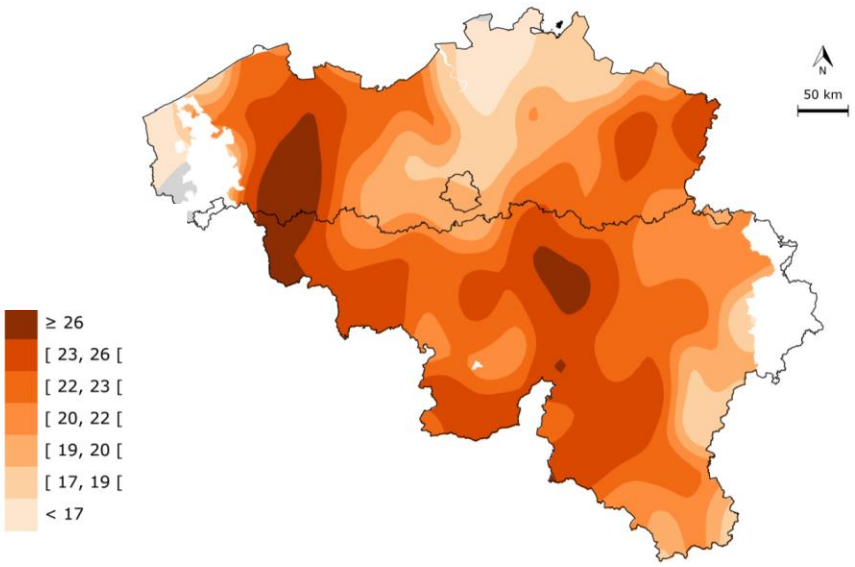
Where?



Crude Death Rate (‰), 1918
All causes

Data and cartography:ARA, Mouvement de l'Etat Civil; UGent Quetelet Center Hisster dataset & UCL Centre de Démographie

Where?



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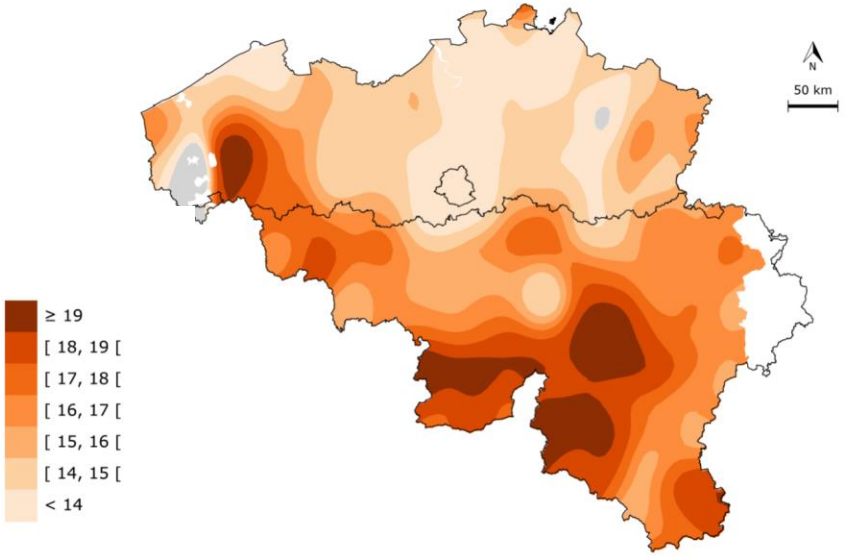

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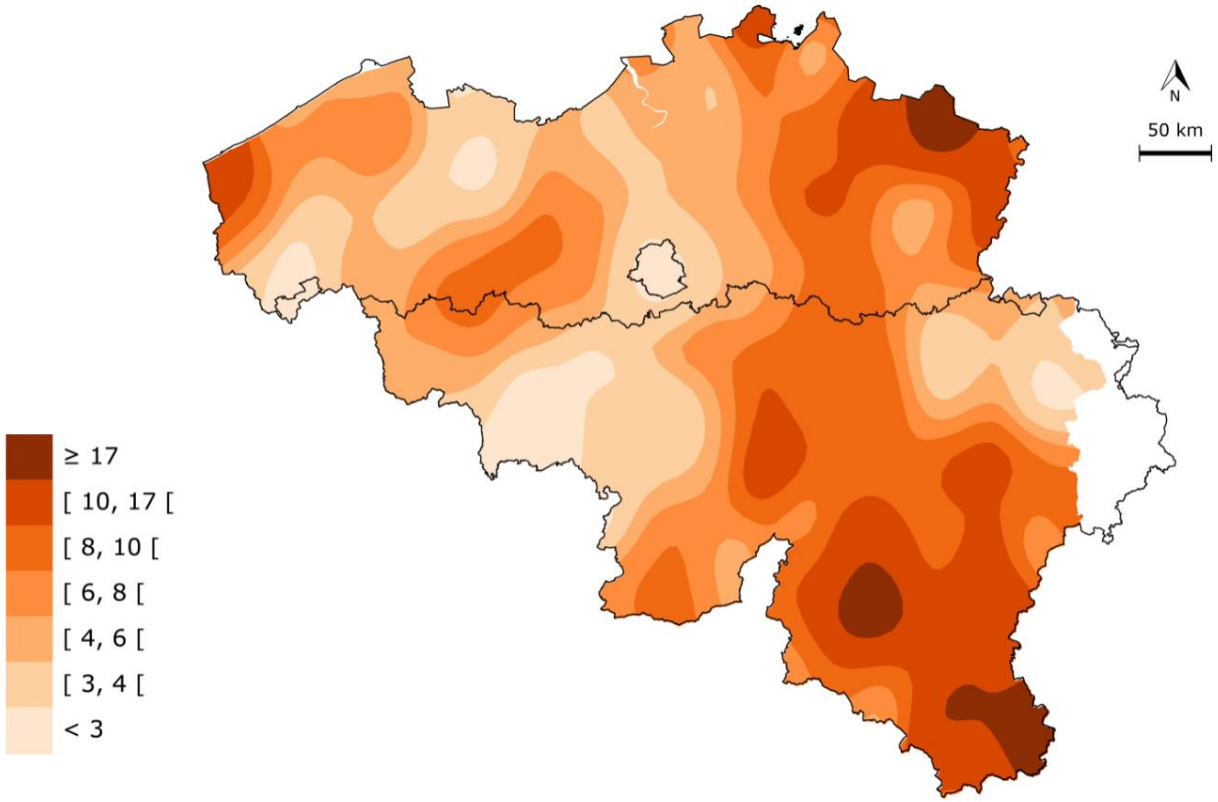


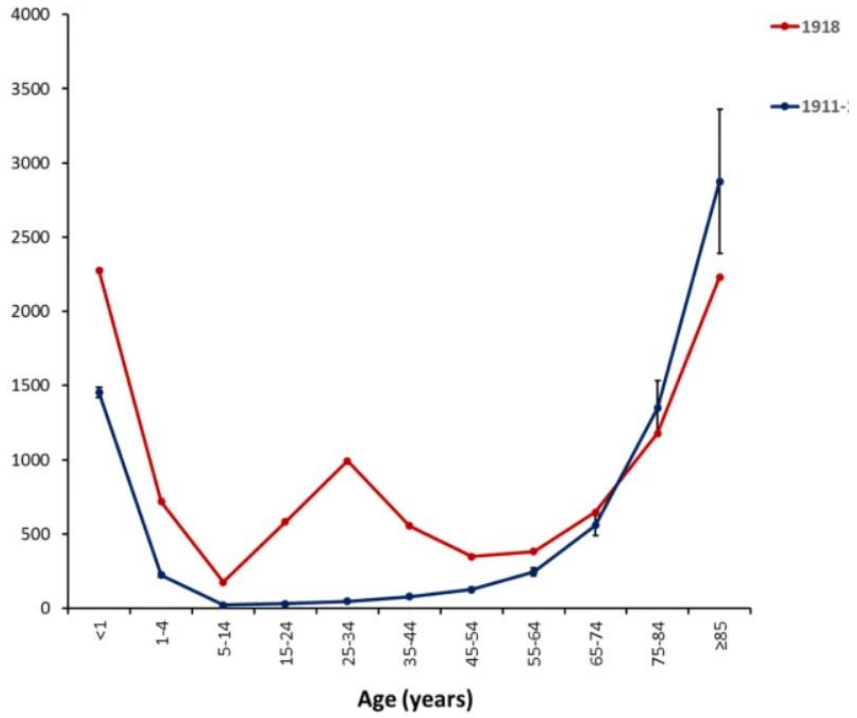
% Deaths by influenza, 1919

Data and cartography:ARA, Mouvement de l'Etat Civil; UGent Quetelet Center Hisster dataset & UCL Centre de Démographie

Age and gender

International studies

- From U to W: young adults
  - no immunity (flu 1889-90)
  - overreaction of immune system (‘cytokine storm’)
  - co-morbidity (tuberculosis)
- Gender: mixed results



Age-specific death rates (per 100.000) due to influenza and tuberculosis, U.S. (Taubenberger and Morens, 2006)

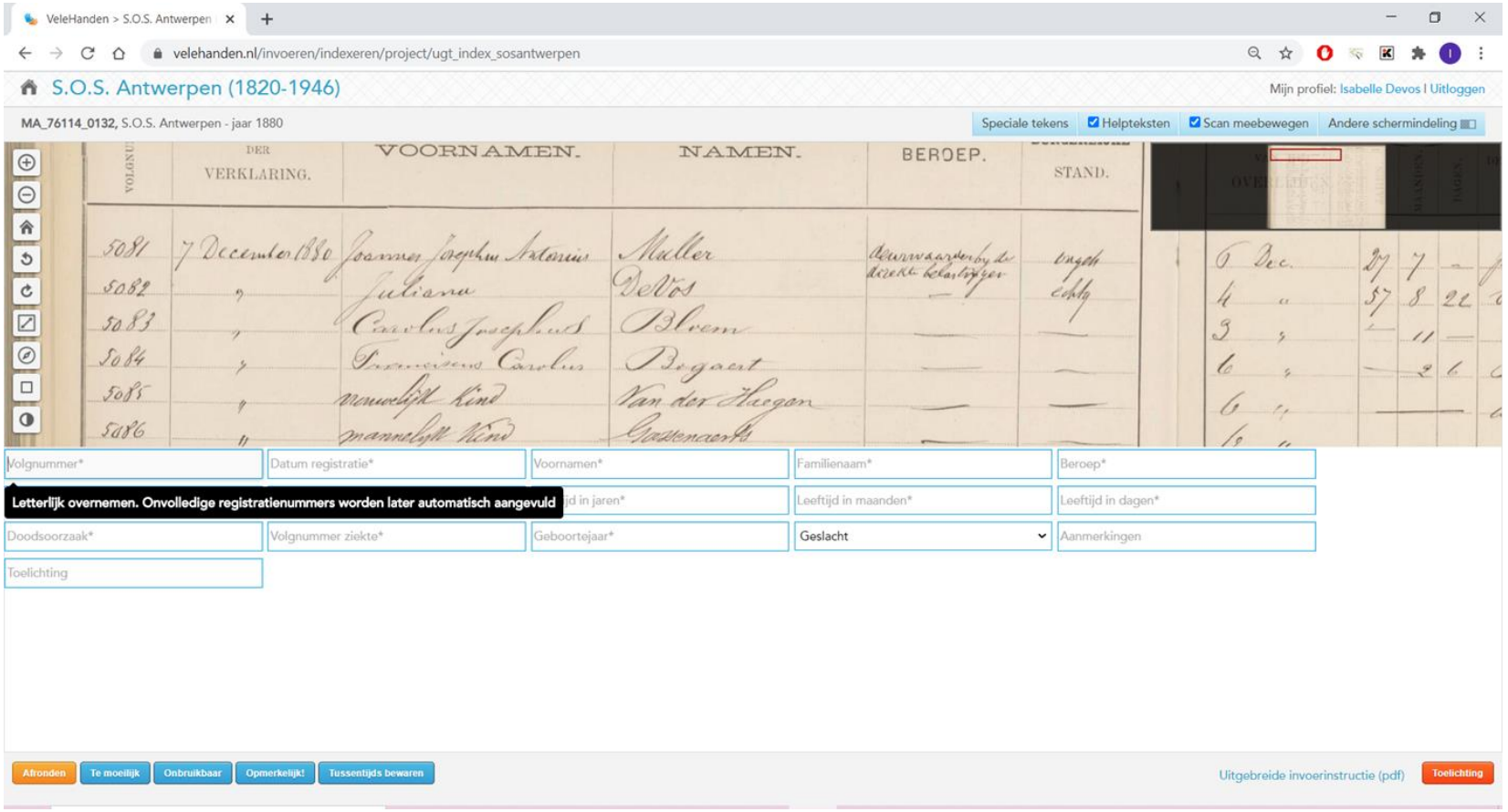
Social class

- Early studies (Crosby 1976, Rice et al. 1988, Tomkins 1992): no social gradient
- Recent studies (Mc Cracken et al. 2003, Herring et al. 2012, Mamelund 2018): occupation, literacy, home ownership, crowding, etc.

first wave hits the poor, the second wave the rich

→ S.O.S. Antwerpen: crowdsourcing unique cause-of-death register (age, occupation, civil status, place of birth, residence)

Citizen Science: www.sosantwerpen.be



This week: entering data of 1918!

Measures


PAS OP voor de SPAANSCHE GRIEP

In de bureelen laat men het rooken toe, tot ontsmetting der keel.
Het beste ontsmettingsmiddel is
MALVA-PASTILLEN, 2 fr. de doos
In het begin in 1918, raadde men ons aan een matig glas Rhum of Cognac. Alcool versterkt het hart.
LEVENS-WIJN 2 + 1 fr. de flesch 5 + 0.75 fr. halve flesch
is een lekkere borrel, en geeft bovendien nog eetlust, doet alle miserie vergeten, doet u vet worden en goed slapen. 1251

APOTHEKEN :
De Blekort
38, Lange Dijkstraat, 38
De Beul
V. D. Weyer
V. D. Berghe
Klevitstraat
Van Sull
Weyckmans

Source: Gazet van Antwerpen

- Limited medical knowledge:

quinine, formal, syrups, aspirine

→1930s: °virus

→1940s: ° vaccine

- Measures
  - No 'national' policy
  - Army: isolation of patients; food, drink and clothing
  - Local measures: mixed (no measures – recommendations - actions)

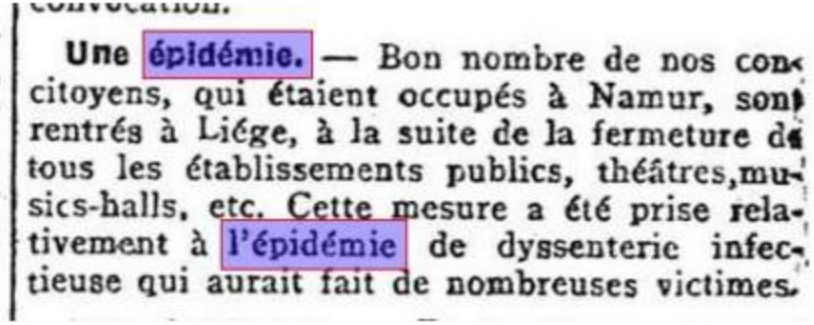
    Few sources: reports of local councils, newspapers

DE SPAANSHE GRIEP.

De Spaansche ziekte is nu ook in België voorgekomen. In verschillende plaatsen heeft zij haar slachtoffers gevonden, wier aantal dagelijks toeneemt. Ook te Brussel heeft zich de geheimzinnige ziekte geopenbaart. Daarop is door de overheid voorzichtigheidshalve bevel gegeven twee scholen te sluiten.

Vooral het Zuiden des lands, Charleroi, Bergen en Namen wordt ernstig geteisterd. Verscheidene fabrieken hebben wegens tijdelijk gebrek aan arbeiders het bedrijf moeten stilleggen.

De Belgische Standaard, 7 Aug. 1918



convocation.

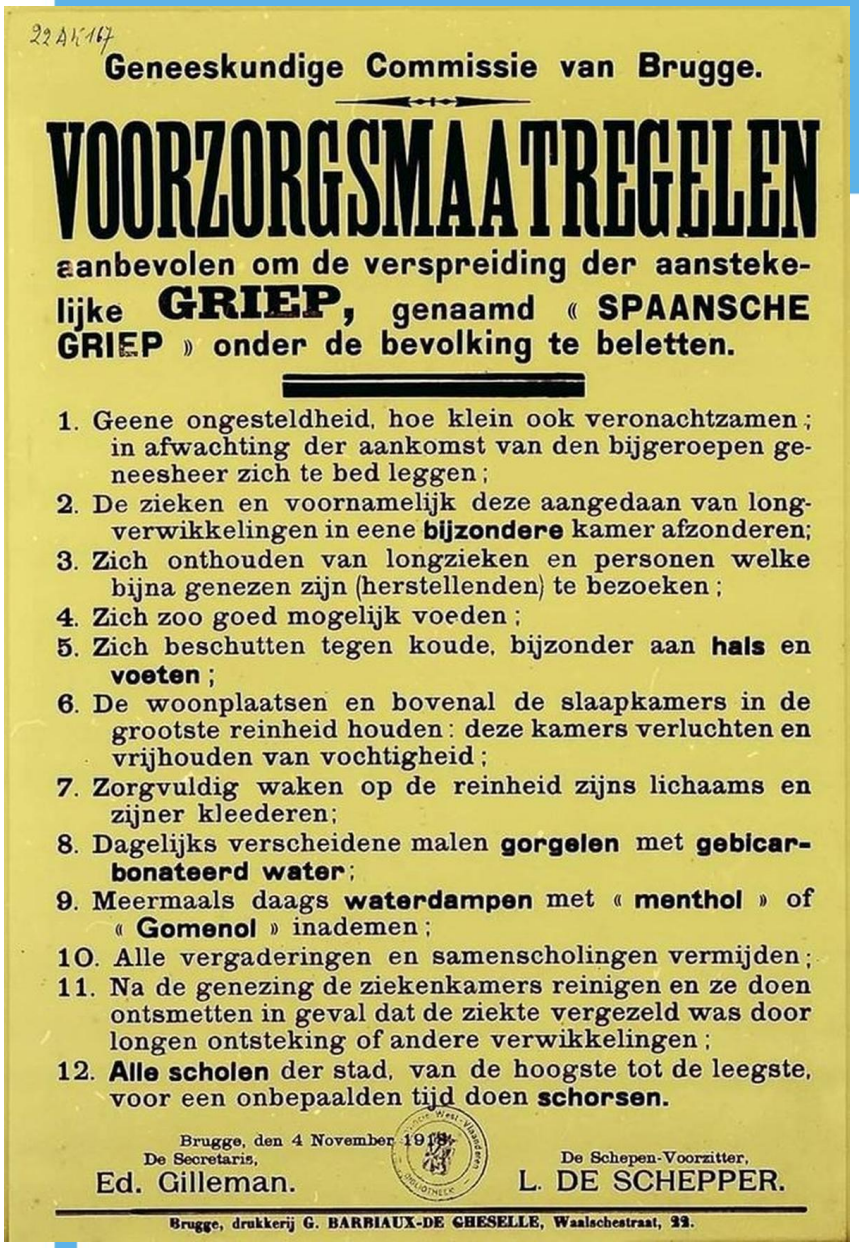
Une épidémie. — Bon nombre de nos concitoyens, qui étaient occupés à Namur, sont rentrés à Liége, à la suite de la fermeture de tous les établissements publics, théâtres, music-halls, etc. Cette mesure a été prise relativement à l'épidémie de dyssenterie infectieuse qui aurait fait de nombreuses victimes.

Le Peuple Wallon, 4 sept. 1918

First wave

'Mysterious disease', German disease, Chinese disease, Spanish flu etc.

Some cities: closing schools, theatres, cafés, etc.



Geneeskundige Commissie van Brugge.

VOORZORGSMAATREGELEN

aanbevolen om de verspreiding der aansteke-lijke **GRIEP,** genaamd « **SPAANSCHE GRIEP** » onder de bevolking te beletten.

1. Geene ongesteldheid, hoe klein ook veronachtzamen ; in afwachting der aankomst van den bijgeroepen geneesheer zich te bed leggen ;
2. De zieken en voornamelijk deze aangedaan van longverwikkelingen in eene **bijzondere** kamer afzonderen;
3. Zich onthouden van longzieken en personen welke bijna genezen zijn (herstellenden) te bezoeken ;
4. Zich zoo goed mogelijk voeden ;
5. Zich beschutten tegen koude, bijzonder aan **hals** en **voeten** ;
6. De woonplaatsen en bovenal de slaapkamers in de grootste reinheid houden : deze kamers verluchten en vrijhouden van vochtigheid ;
7. Zorgvuldig waken op de reinheid zijns lichaams en zijner kleederen;
8. Dagelijks verscheidene malen **gorgelen** met **gebicarbonateerd water** ;
9. Meermaals daags **waterdampen** met « **menthol** » of « **Gomenol** » inademen ;
10. Alle vergaderingen en samenscholingen vermijden ;
11. Na de genezing de ziekenkamers reinigen en ze doen ontsmetten in geval dat de ziekte vergezeld was door longen ontsteking of andere verwikkelingen ;
12. **Alle scholen** der stad, van de hoogste tot de leegste, voor een onbepaalden tijd doen **schorsen.**

Brugge, den 4 November 1918.

De Secretaris, Ed. Gilleman.

De Schepen-Voorzitter, L. DE SCHEPPER.

Brugge, drukkerij G. BARBIAUX-DE CHESELLE, Waalschestraat, 22.

Notice, Bruges, 4 nov. 1918

Second wave

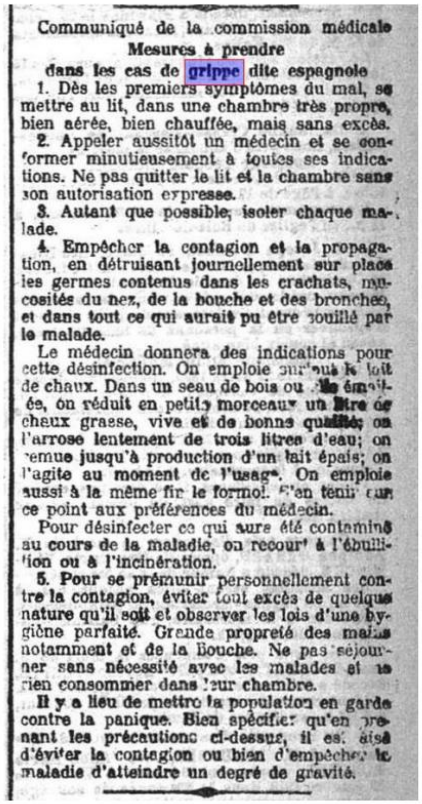
Isolation of patients

Food, drink, clothing

Ventilation of rooms
Desinfecting

Avoid gathering and meetings

Closing of schools



Communiqué de la commission médicale
Mesures à prendre
dans les cas de grippe dite espagnole

1. Dès les premiers symptômes du mal, se mettre au lit, dans une chambre très propre, bien aérée, bien chauffée, mais sans excès.
2. Appeler aussitôt un médecin et se conformer minutieusement à toutes ses indications. Ne pas quitter le lit et la chambre sans son autorisation expresse.
3. Autant que possible, isoler chaque malade.
4. Empêcher la contagion et la propagation, en détruisant journellement sur place les germes contenus dans les crachats, mucosités du nez, de la bouche et des bronches, et dans tout ce qui aurait pu être souillé par le malade.

Le médecin donnera des indications pour cette désinfection. On emploie surtout le lait de chaux. Dans un seau de bois ou de émaillé, on réduit en petits morceaux un litre de chaux grasse, vive et de bonne qualité; on l'arrose lentement de trois litres d'eau; on remue jusqu'à production d'un lait épais; on l'agite au moment de l'usage. On emploie aussi à la même fin le formol. S'en tenir sur ce point aux préférences du médecin.

Pour désinfecter ce qui aura été contaminé au cours de la maladie, on recourt à l'ébullition ou à l'incinération.

5. Pour se prémunir personnellement contre la contagion, éviter tout excès de quelque nature qu'il soit et observer les lois d'une hygiène parfaite. Grande propreté des mains notamment et de la bouche. Ne pas séjourner sans nécessité avec les malades et ne rien consommer dans leur chambre.

Il y a lieu de mettre la population en garde contre la panique. Bien spécifier qu'en prenant les précautions ci-dessus, il est aisé d'éviter la contagion ou bien d'empêcher la maladie d'atteindre un degré de gravité.

L'Ami de l'ordre (Namur), 25 aug. 1918

Dit volledig maal kost 15 centiem.

DE SPAANSCHE GRIEP.

Uit Leuven wordt gemeld:

Langs om meer neemt deze nieuw medische ziekte een grootere uitbreiding in onze stad en hare omstreken. Het getal overlijdens neemt schrikwekkend toe en, volgens de laatste ingeleverde verslagen der geneesheeren, telt men, alléén onder de schoolgaande jeugd, meer dan drie duizend gevallen van Spaansche griep.

Na de gemeentescholen, hebben thans ook al de gestichten voor middelbaar onderwijs, evenals de vrije scholen hare poorten gesloten; terwijl een decreet, door de stadsoverheid uitgevaardigd, alle vereeningen van personen gedurende een geruimen tijd verbiedt, en het sluiten heeft bevolen van allé kinema's en spektakelzalen.

VERONGELUKT [illegible]

Belgisch Dagblad, 4 nov. 1918

HEALTH ORDER DOOMS LODGE HALL COBWEBS

Grip Ban on All Meetings Until Places Are Renovated; 21 Theaters Reopen.

GRIP VIGILANCE STILL NEEDED

Dr. Robertson Warns Against Relaxing Precaution, Despite Wane of Epidemic

'OPEN-FACE' SNEEZERS TO BE ARRESTED

Orders to arrest any ... son indulging in the "open face" sneeze or cough in

POLICE RAID SALOONS IN WAR ON INFLUENZA; KEEP CHURCH WINDOWS OPEN

Stringent New Orders Are Issued for Preventing Spread of Epidemic; Police Ambulances Are Drafted; 100,000 Doses of Vaccine on Way.

1,613 NEW CASES SHOW DECREASE IN CITY; DOWNSTATE HIT WORST

FLU CURFEW TO SOUND FOR CITY SATURDAY NIGHT

Persons Not on Business Expected to Quit the Streets at 9 o'Clock.

The curfew will ring or, rather, blow in Chicago tomorrow night. Promptly at 9 o'clock the whistles of

DRAFT MEN TO BE FIRST

'NONESSENTIAL' CROWDS BARRED IN EPIDEMIC WAR

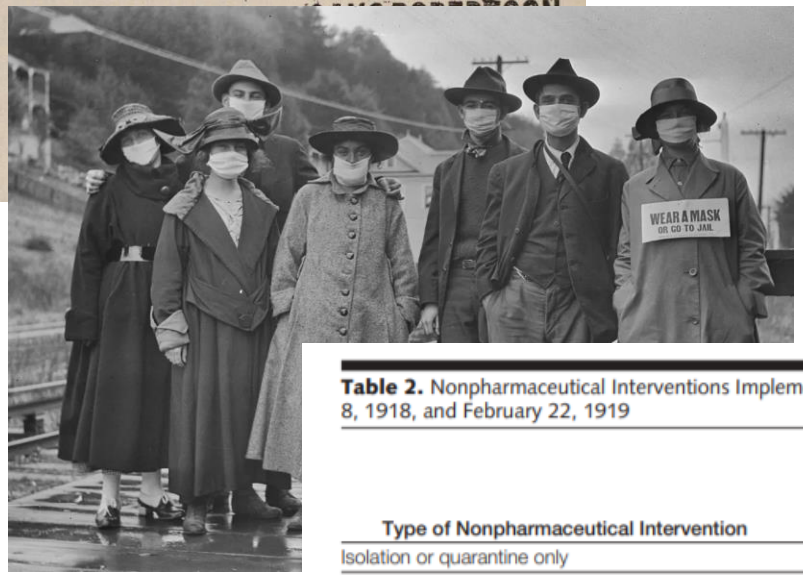
Churches and Saloons Exempt; Conventions, Athletics, Parties Hit.

FREE DOCTOR

Influenza victims unable to pay for a doctor can obtain one by calling Main 447, Local 108, day or night.

CHURCH WINDOWS MUST STAY OPEN,

Chicago News, 1918



San Francisco, 1918

Table 2. Nonpharmaceutical Interventions Implemented in 43 US Cities Between September 8, 1918, and February 22, 1919

Type of Nonpharmaceutical Intervention	No. (%) of Cities Implementing Nonpharmaceutical Intervention for ≥1 wk (N = 43)[a]	Median (Range) Duration of Nonpharmaceutical Intervention, wk
Isolation or quarantine only	15 (35)	1 (1-10)
School closure only	22 (51)	1 (1-7)
Public gathering ban only	6 (14)	1.5 (1-5)
Isolation and quarantine and school closure	2 (5)	5.5 (4-7)
Isolation and quarantine and public gathering ban	4 (9)	4 (2-5)
School closure and public gathering ban	34 (79)	4 (1-10)
Isolation and quarantine, school closure, and public gathering ban	15 (35)	4 (2-6)

Source: Markel et al., 2007

The end?

- Range of measures taken at local level, but no coherent policy

- End World War I: less army troops
- (Herd) immunity?
- Mutation of virus: less virulent?

Source: Royal Library Belgium, Postcard 1918

Where do we go from here?

Brain-belspo interdisciplinary project
'Epidemics and Inequalities in Belgium from the Plague to Covid-19'
(UA, UGent & UCL) www.epibel.be

- Chronology of excess mortality by week and day for 1918 and early 1919 for different Beligum cities
- Geography of Spanish flu in 1919, including tuberculosis (co-morbidity)
- Profile of victims (S.O.S. Antwerpen!)
- Local policy: systematic analysis of measures mentioned in reports of local councils, newspapers (in relation to excess mortality)

UCLouvain

Earth and Life Institute (ELI)

Gouverner en temps de pandémie: la grippe espagnole (1918-20)

Besturen in tijden van pandemie: De Spaanse Griep (1918-20)

Sophie Vanwambeke

20 avril 2021

St. Louis Red Cross Motor Corps on duty during influenza epidemic (1918). Library of Congress

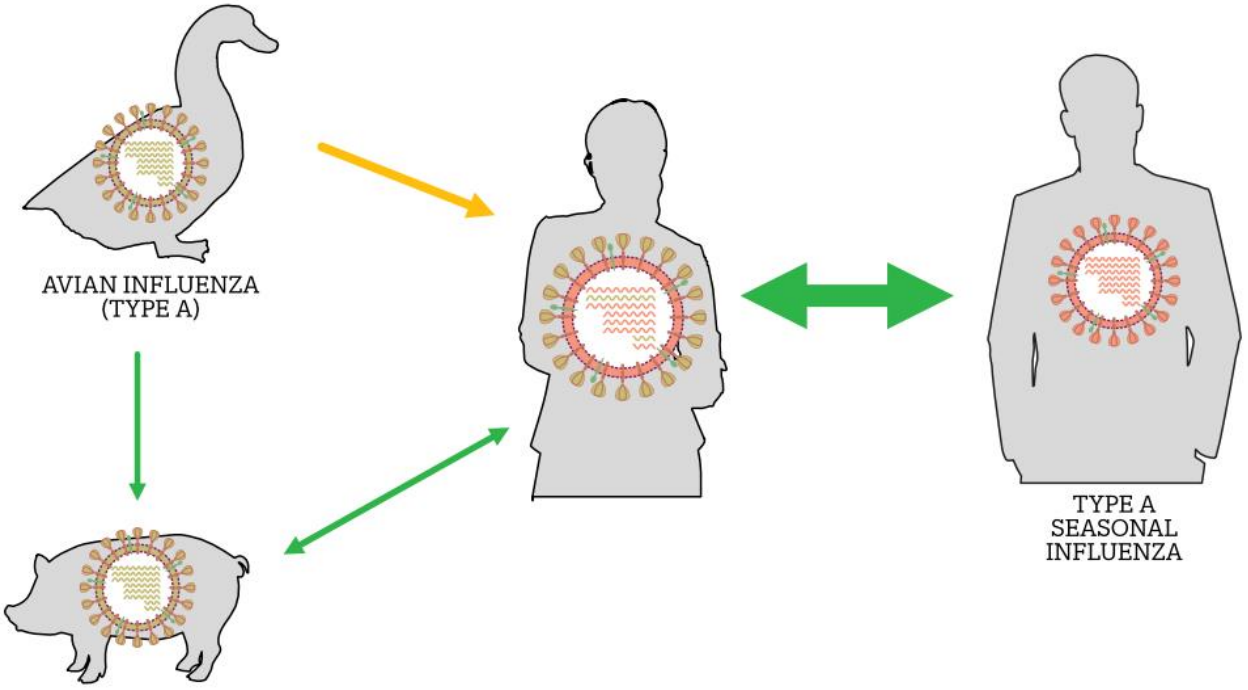
Outline

- Influenza viruses, the 1918-1919 virus, and epidemiology of respiratory diseases

- Spatial diffusion and control at various scales
  - Global trends
  - Heterogeneity in trends: Australia and island epidemiology
  - Multiple seeds and spatial contagion in the UK
  - Spatial dynamics in Belgium

- What for Belgium

Influenza viruses: « an unchanging disease due to a changing virus »*



Adapted from Van-Tam and Sellwood, 2010

! Viruses were not identified at the time

* *Stuart-Harris and Schild, 1976, quoted by Smallman-Raynor and Cliff, 2012*

The « Spanish » influenza virus and its hypothesized origin

3 hypotheses for origin:

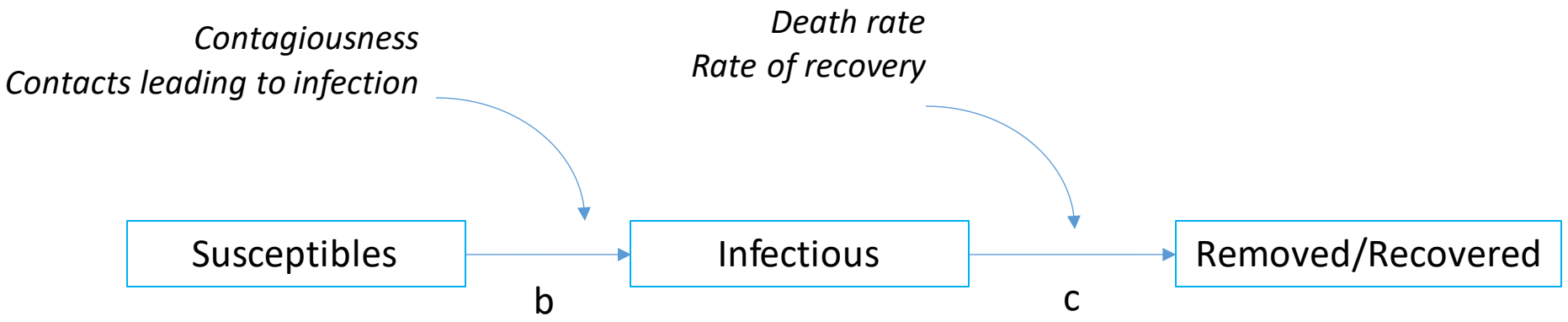
- Camp Funston/Haskell, Kansas, USA: epidemics identified in the US as early as March 1918 (seasonal flu?)
- Etaples, France: cases of severe respiratory disease of unidentified origin (e.g. « purulent bronchitis ») since 1916-1917
- China

→Further understanding of the virus' evolution will not elucidate its spatial origin and path
→Very fast global diffusion, likely through multiple seeds, June-Septembre 1918

Taubenberger, Kash, Morens, 2019; Worobey et al., 2019

Diffusion of (respiratory) infectious diseases: In the population

« Classic » SIR model: homogenous mixing of population



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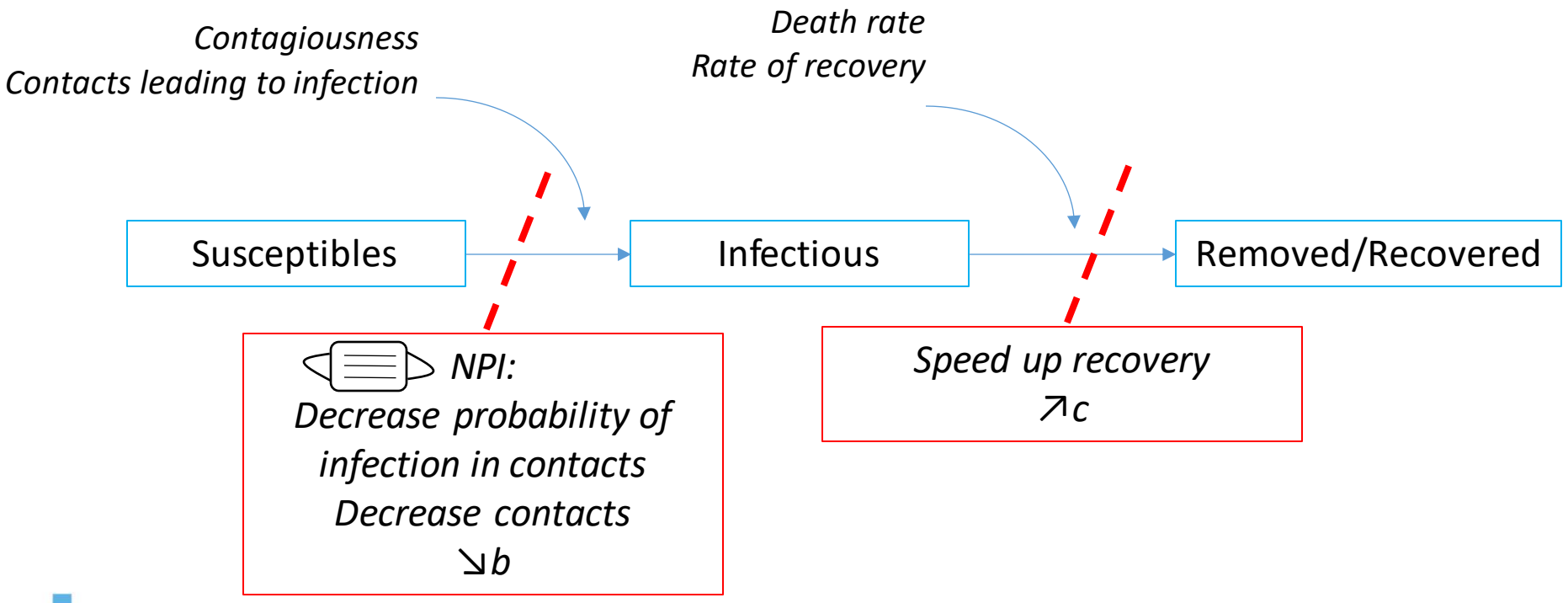
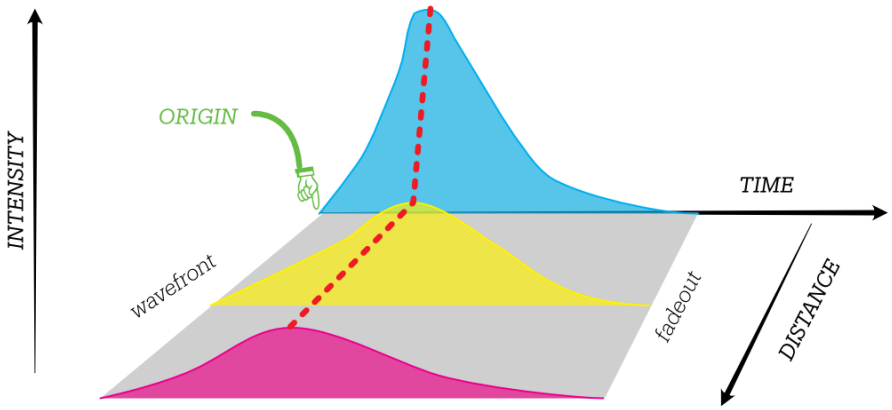
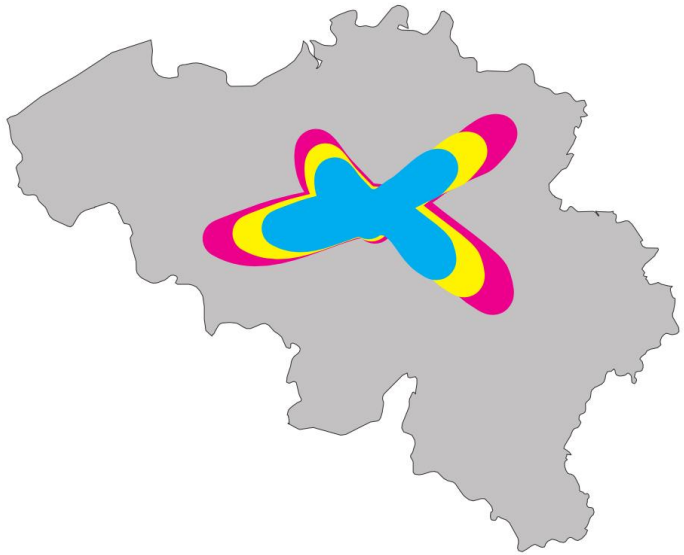


Diffusion of (respiratory) infectious diseases: In space





Adapted from Smallman-Raynor and Cliff, 2012

Spatial diffusion in India

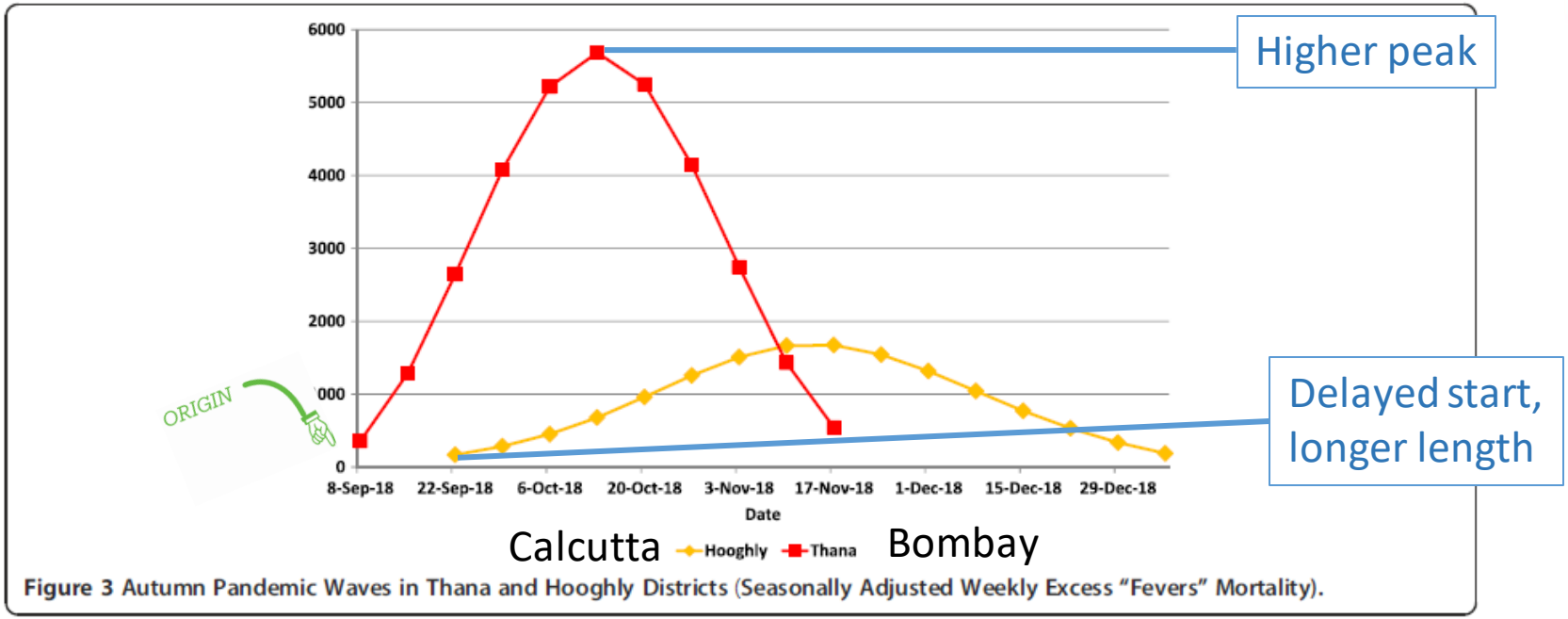


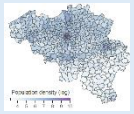
Figure 3 Autumn Pandemic Waves in Thana and Hooghly Districts (Seasonally Adjusted Weekly Excess "Fevers" Mortality).

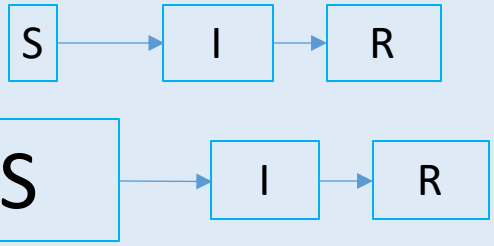
Chandra and Kassen-Noor, 2014 and annotations

Diffusion of (respiratory) infectious diseases: In space

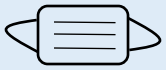
Ratio between Susceptibles and c/b shapes the wave

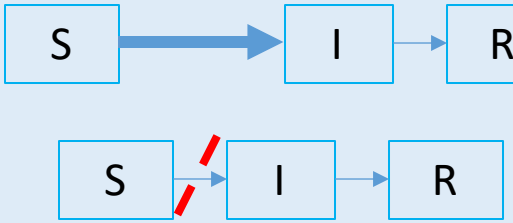
Change volume of S

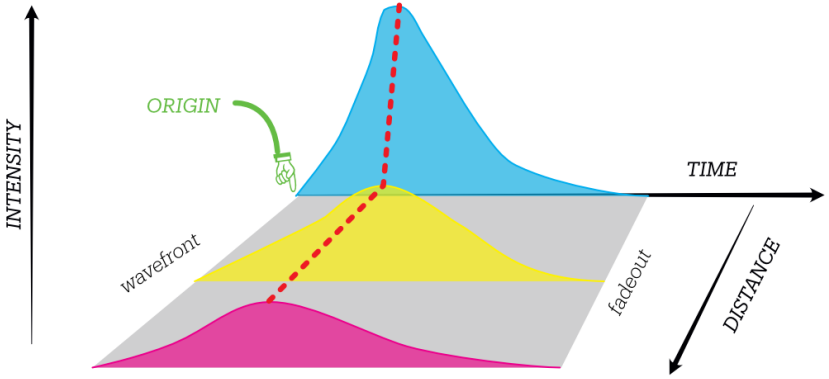




Change b, rate of transmission





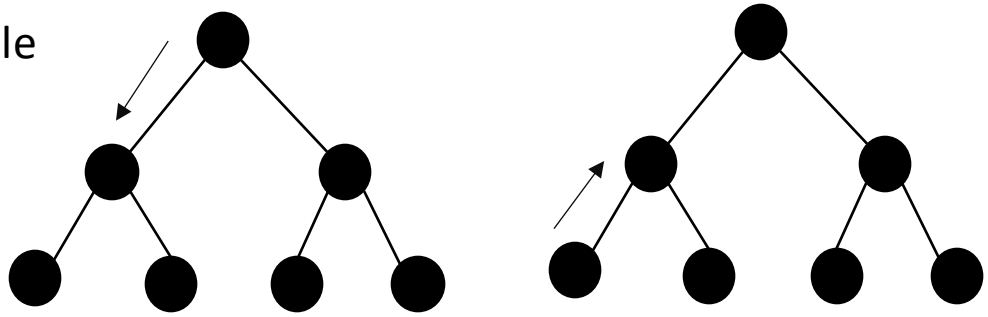


Adapted from Smallman-Raynor and Cliff, 2012

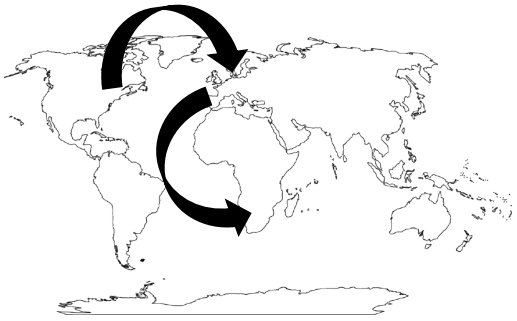
Diffusion and travel

Contagion: local diffusion

Hierarchical diffusion: regional scale

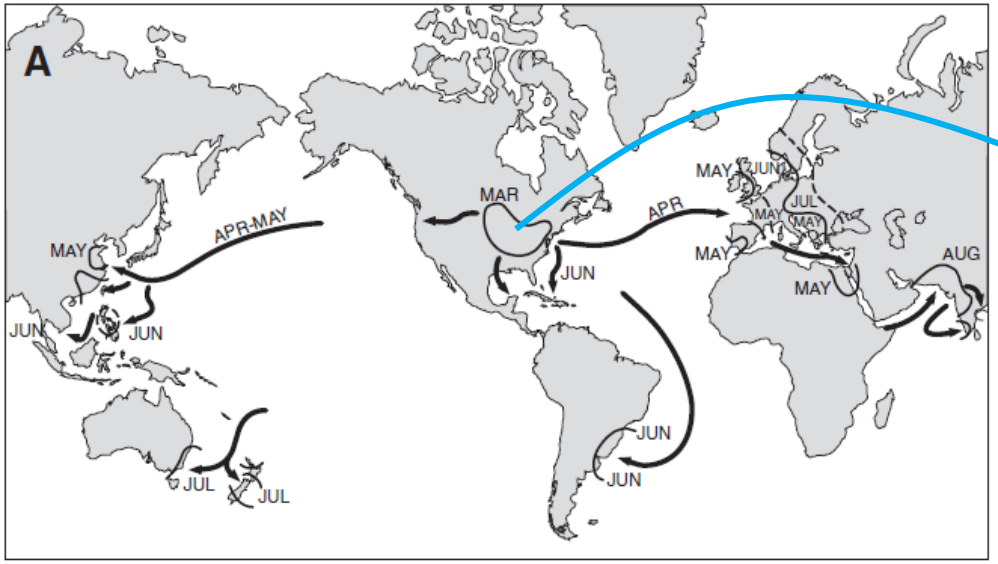


Relocation: broad scale diffusion

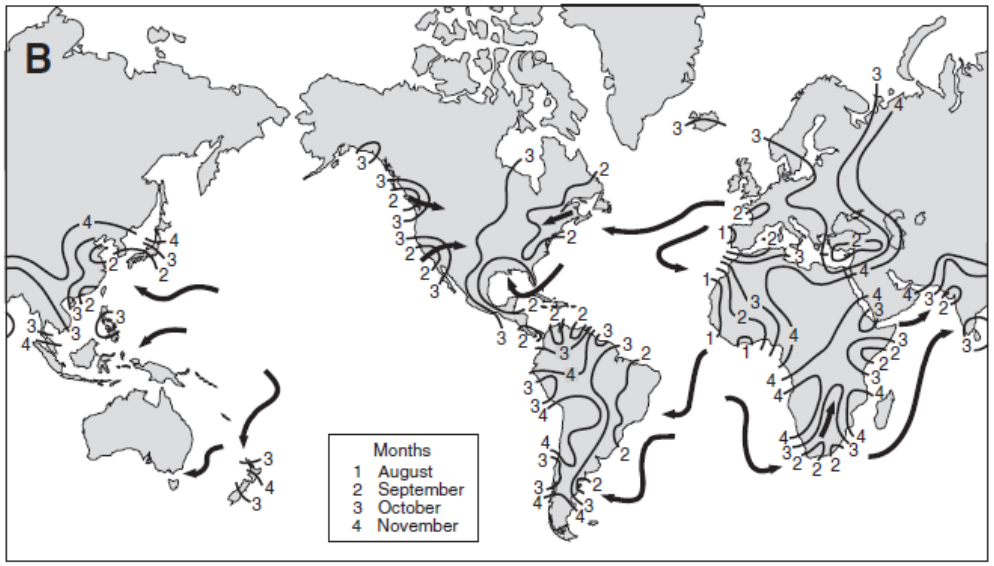


Global overview

Wave I



Wave II

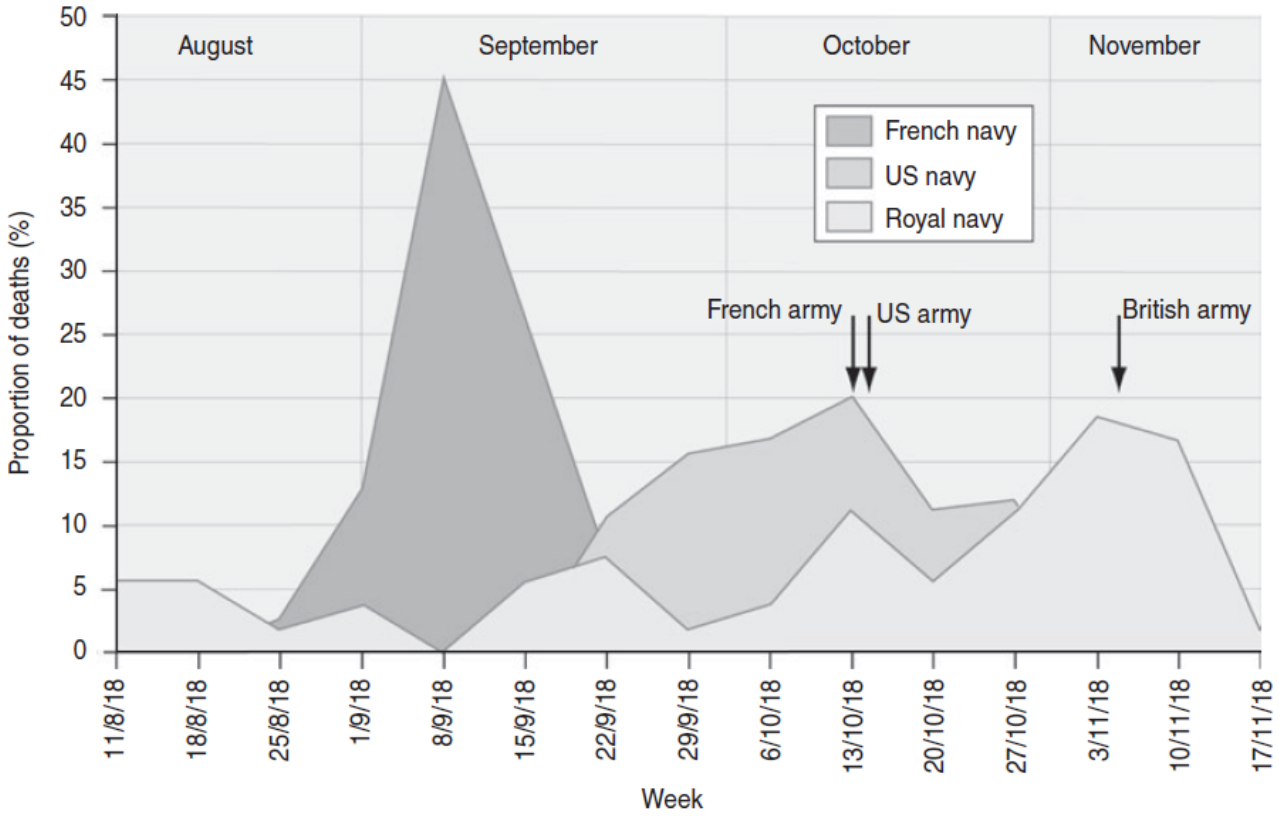


Camp Funston (KS) origin?

Smallman-Raynor and Cliff, 2004, adapted from Patterson and Pyle, 1991

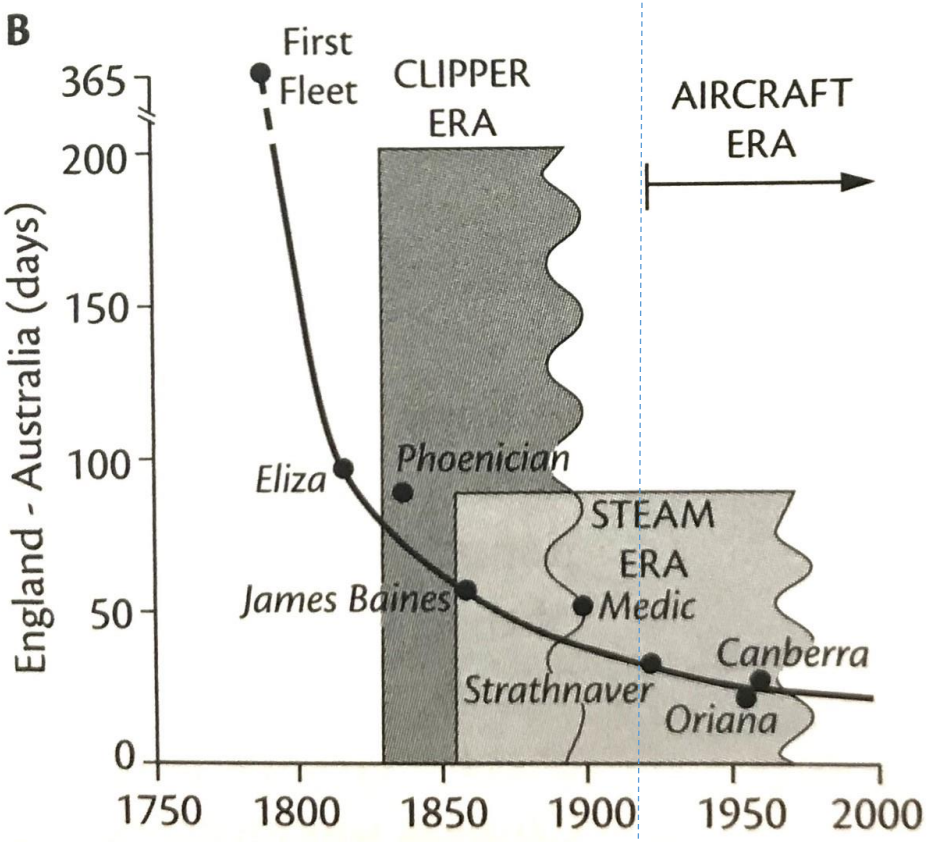
Spatial and temporal heterogenity

→*Disaggregated analysis can reveal strong heterogeneity, as illustrated for deaths in the navies of different armies*



Shanks et al., 2013

Heterogeneity in trends: Australia and island epidemiology



Smallman-Raynor and Cliff 2013

Counter measures against long-range relocation

Australia: established quarantine for incoming boats from October 1918

79 ships recorded cases; no one allowed to leave ship until cleared.

Value	Vessels (number)	Susceptibles (crew and passengers)	Average susceptibles per vessel
Total	228	73,482	322
Uninfected	149	15,016	101
Infected[1]	79	57,741	731[2]
Influenza cases		2,795	
Influenza deaths		99	

Notes: [1] Quarantined. [2] Including troopships.

Smallman-Raynor and Cliff 2006, Shanks et al., 2018

Counter-measures against regional, hierarchical diffusion

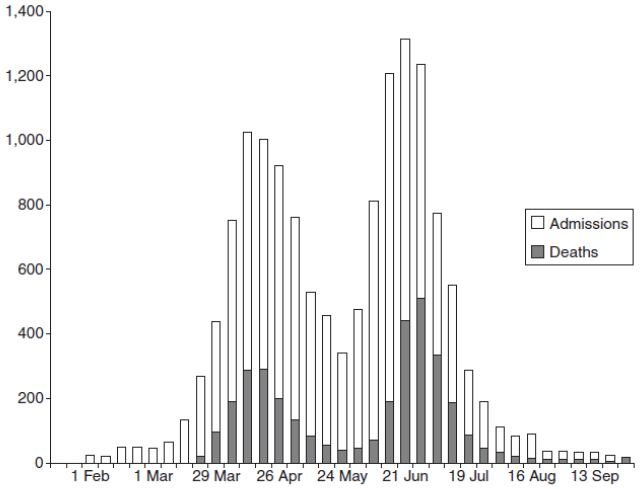


Figure 8.2 Hospital admissions and deaths from influenza, Sydney, 1919.

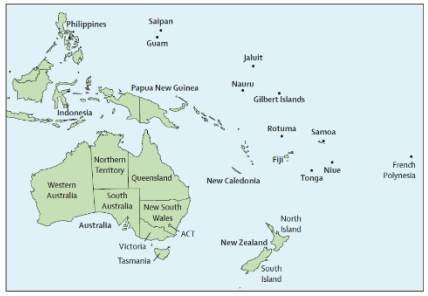


Figure 1: Map showing different Pacific states and islands described in the text as being affected by the 1918–21 influenza pandemic

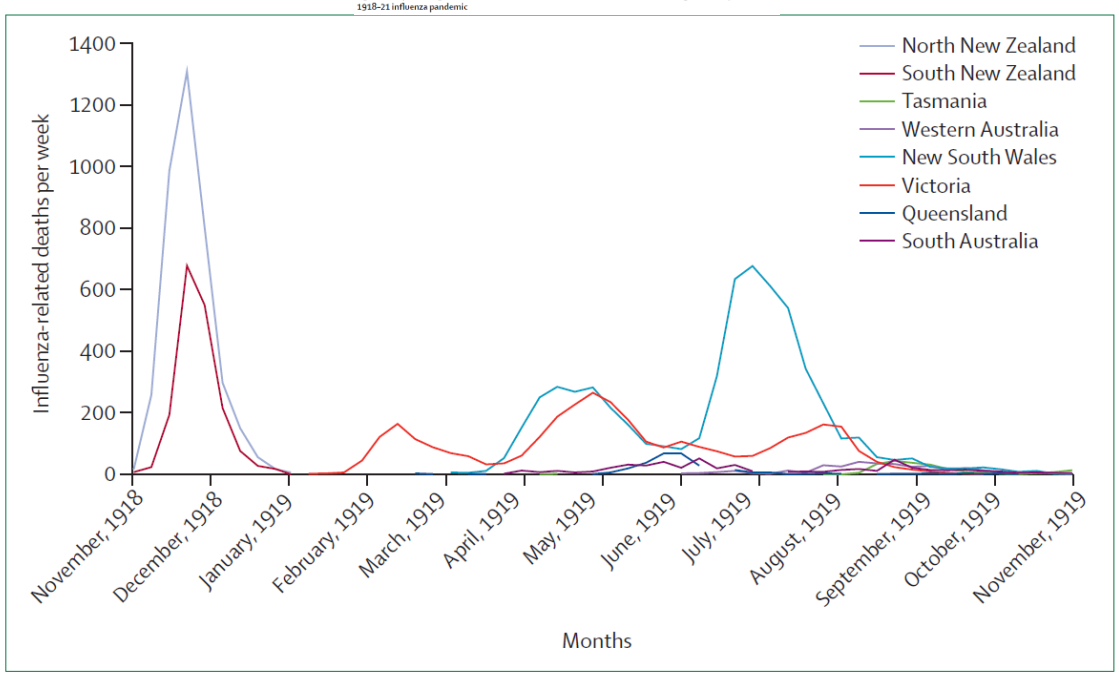


Figure 5: **Estimated numbers of influenza-related deaths in New Zealand and Australia during the 1918–19 influenza pandemic by main island in New Zealand and state in Australia[17,21,22,38,39]**

McCracken and Curson, 2003; Shanks et al., 2018

Counter-measures against local diffusion

Feb 3rd: School and other closures, masks, shops open

Late March/early April: Restrictions again

All restrictions lifted

Relaxing

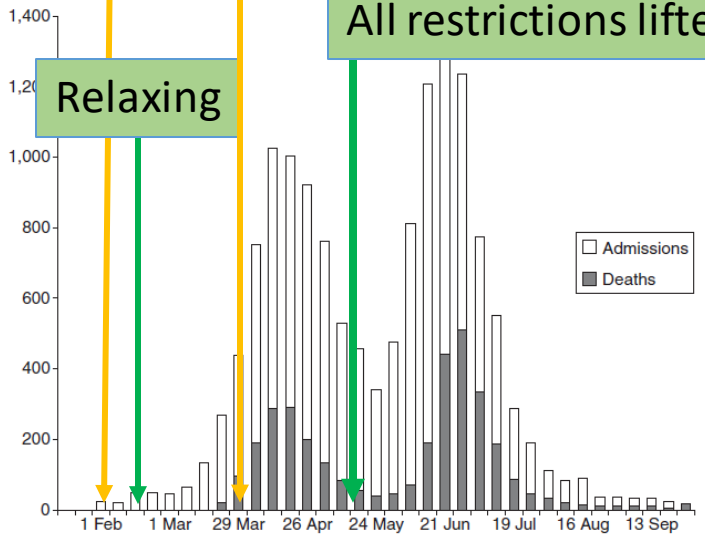
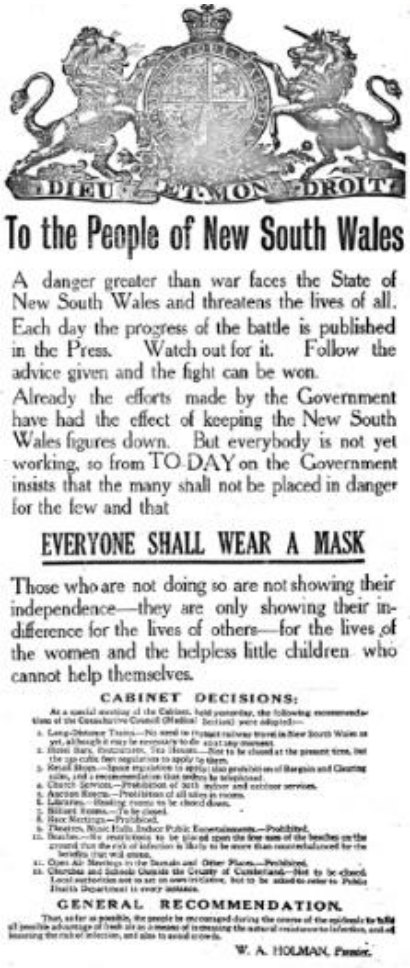


Figure 8.2 Hospital admissions and deaths from influenza, Sydney, 1919.



To the People of New South Wales

A danger greater than war faces the State of New South Wales and threatens the lives of all. Each day the progress of the battle is published in the Press. Watch out for it. Follow the advice given and the fight can be won.

Already the efforts made by the Government have had the effect of keeping the New South Wales figures down. But everybody is not yet working, so from TO-DAY on the Government insists that the many shall not be placed in danger for the few and that

EVERYONE SHALL WEAR A MASK

Those who are not doing so are not showing their independence—they are only showing their indifference for the lives of others—for the lives of the women and the helpless little children who cannot help themselves.

CABINET DECISIONS:

GENERAL RECOMMENDATION.

W. A. HOLMAN, *Premier.*

Figure 8.3 Proclamation of N.S.W. Government regulations to co epidemic.

Source: *The Sydney Morning Herald*, 3 February 1919. Reproduced here of *The Sydney Morning Herald*.

McCracken and Curson, 2003

Local diffusion: seeds vs. geography

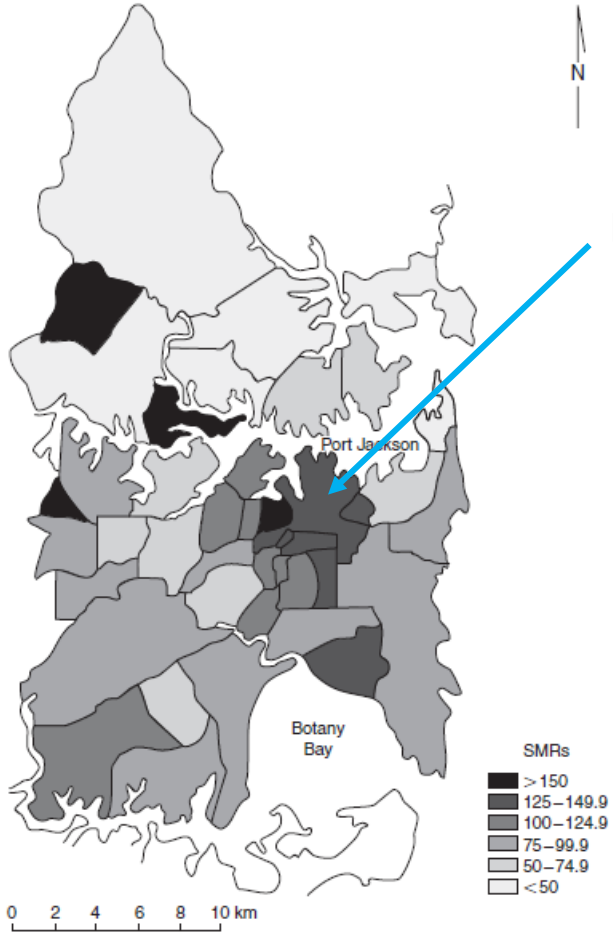


Figure 8.5 Age–sex standardised influenza mortality ratios, Sydney, 1919.

Possible seeds

Standardised mortality ratio correlated to:

- Crowded housing
- Type of employment

Males more affected – but not everywhere

Multiple seeds and spatial diffusion

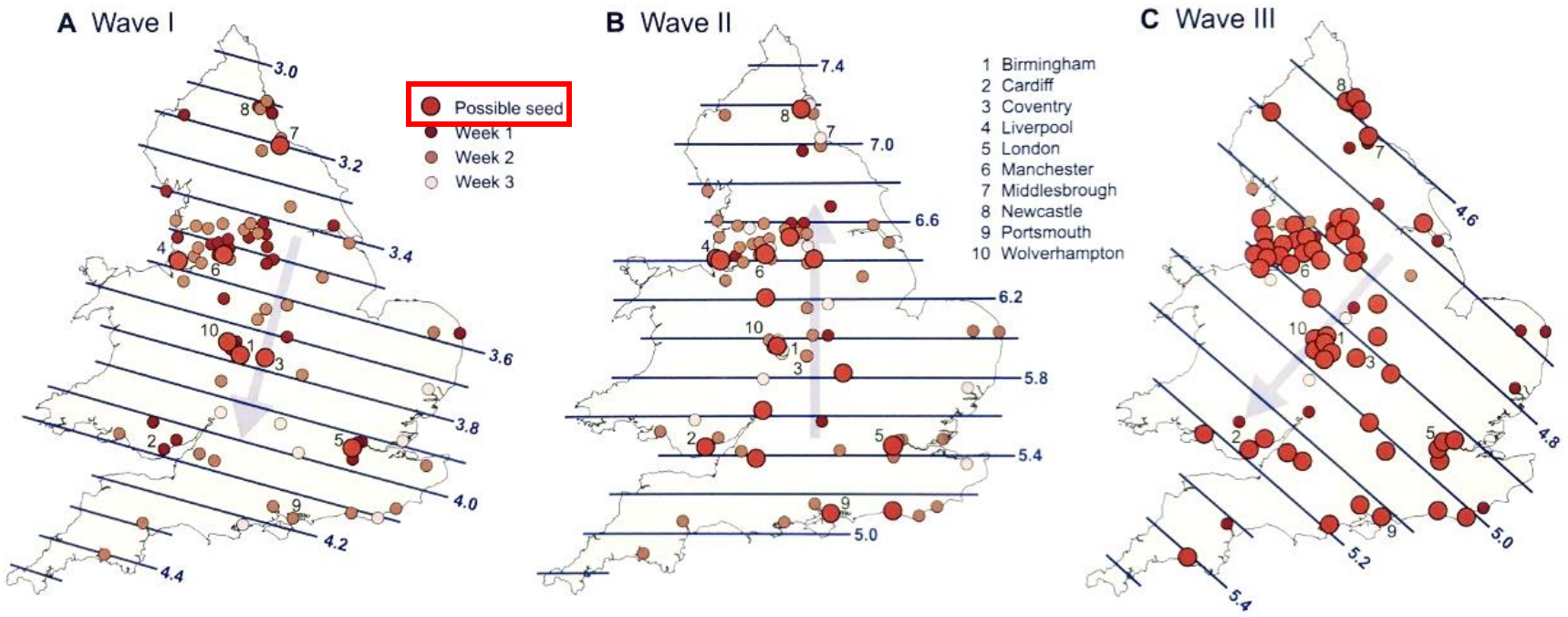
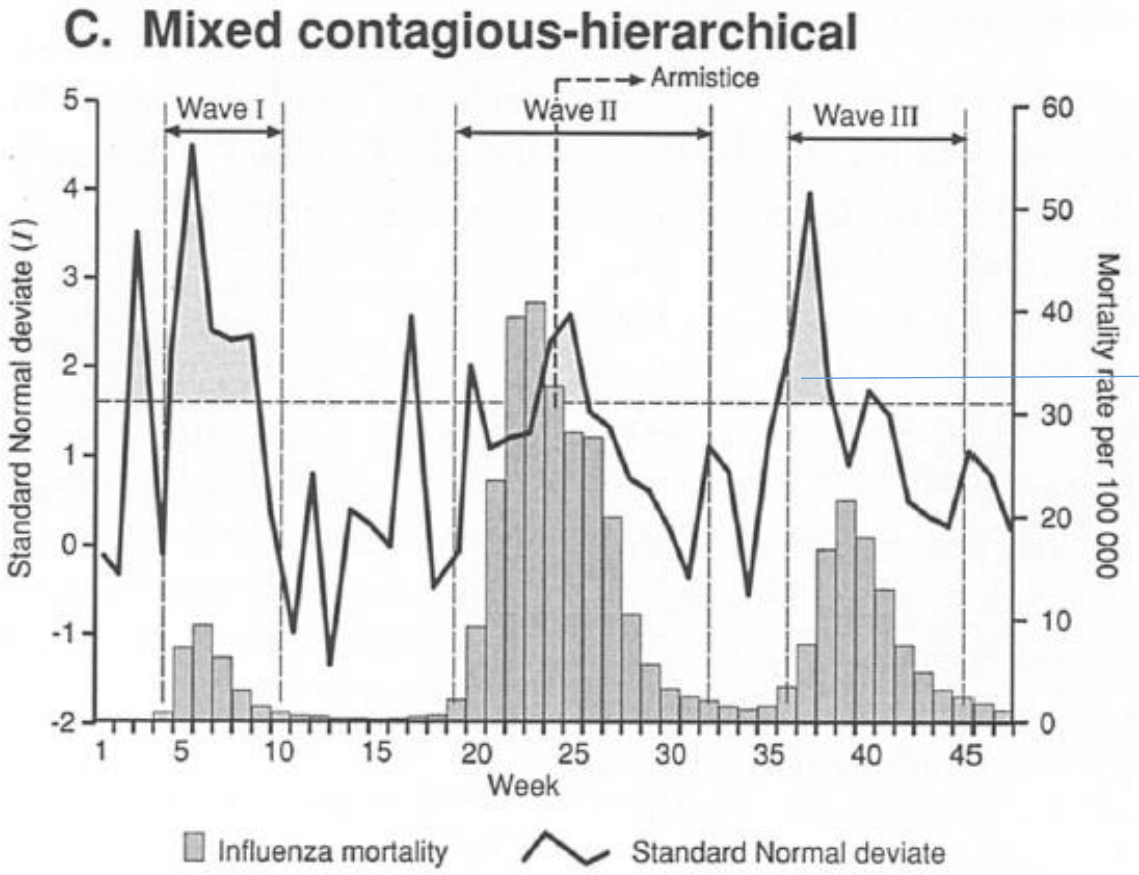


Figure 5.9 The spread of influenza in London and the county boroughs of England and Wales, June 1918–April 1919. (A) Wave I, June–August 1918. (B) Wave II, October 1918–January 1919. (C) Wave III, February–April 1919. Geographical units are represented by circles shaded brown according to the week of the corresponding wave in which the first influenza deaths were recorded. Boroughs in which influenza deaths were reported in the week immediately preceding the onset of a given wave are defined as seed locations and are plotted as orange circles. Linear trend surfaces for the expected time to death are shown; numbers attached to the trend surfaces are in weeks. The vectors indicate the general direction of spread of each wave.

Smallman-Raynor and Cliff, 2012

Spatial structure as a clue to diffusion processes



Indicates spatial contagion

Smallman-Raynor et al., 2002

Diffusion and control

- Multiple diffusion processes often combine, although they correspond to different counter measures
- Diffusion affected by:
  - Local conditions and potentially measures
  - Geographic and demographic features of various areas
  - Timing in relation to other processes e.g. demobilisation of troops
- All measures likely « porous » to a degree but may have helped « flatten the curve »

Spatial diffusion in Belgium

Sources: Population records; diaries

Wave I

Coherence to suggest a SW→NE or W→E direction

Some mention « German illness »

! Mortality lower

Recommandations, some school closures and bans on gatherings

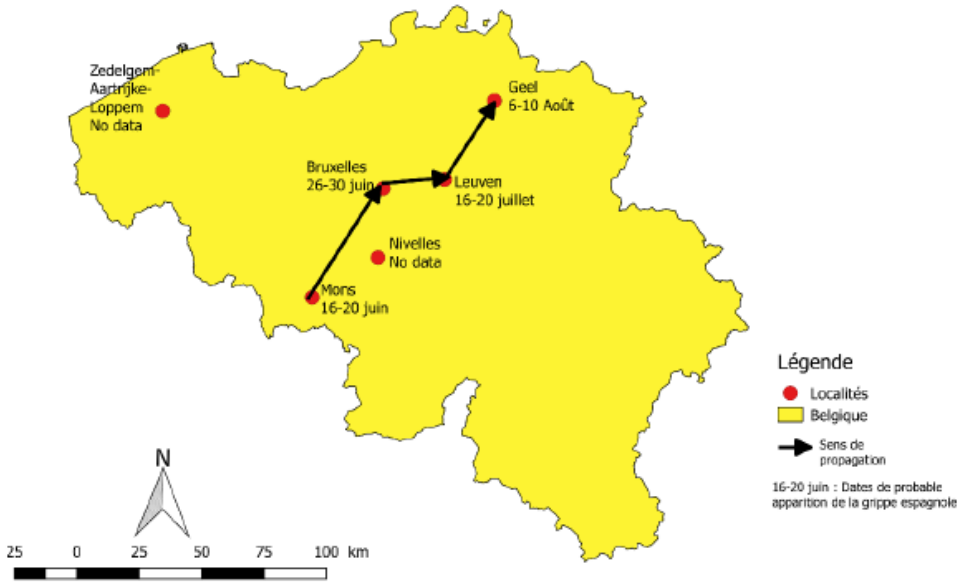


Figure 3: Carte représentant l'hypothétique propagation de la grippe espagnole en Belgique occupée (Vague 1)

Brulard, 2018

Spatial diffusion in Belgium

Sources: Population records; diaries

Wave II
Similar trend in direction
Heavy mortality
Massive movements of troops and civilians

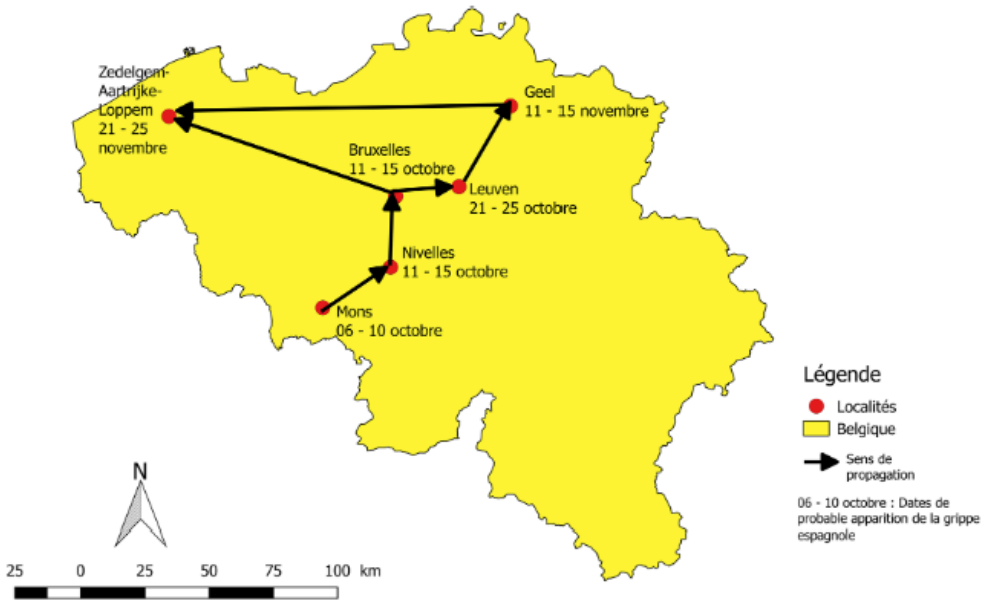


Figure 4: Carte de la propagation hypothétique de la grippe espagnole en Belgique occupée (Vague 2)

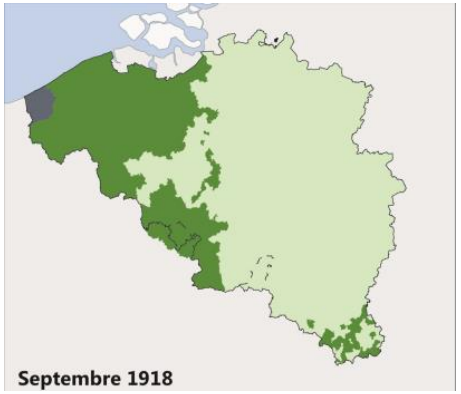
Brulard, 2018

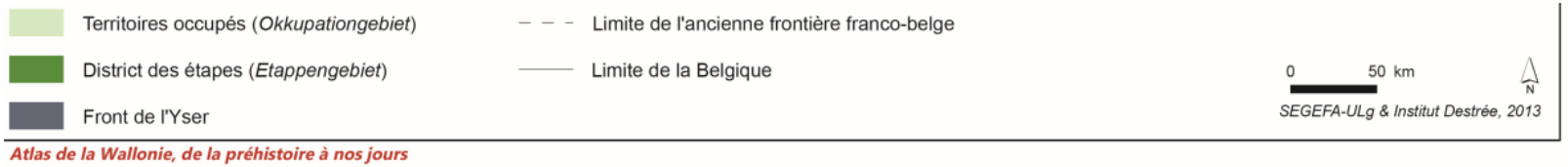
Belgian specificities in the (study of the) « Spanish » influenza pandemic

In Belgium, diversity of:

- movement
- populations: civilians, troops, evacuees
- spaces (front/operation area; rear area (« zone des étapes »); occupied area)

Challenge of data availability requiring a very granular approach in space and time





Source: http://connaitrelawallonie.wallonie.be/fr/histoire/atlas/ettapengebiet-1915-1918#.YH2AJh0zZPY

Conclusion

What are the features of the diffusion of « Spanish » influenza in Belgium?

→existing clues to complexity and heterogeneity

Unique situation of Belgium

Much ressources untapped so far

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