



Citizens and cities facing new hazards and threats

30th November to 4th December 2020

SESSION 1: COVID-19

Simona Cavallini
Fondazione FORMIT
TIEMS Italian Chapter

How COVID19 pandemic is affecting Italy: impact, response and recovery

Table of content

- The Italian Health system
- Italy as a «first mover»
- Data on deaths and intensive care: two waves and four key dates
- The geographical scope as one of the main difference between the two waves
- A response with an approach at regional level: 21 indicators and 4 scenarios
- Lessons learnt after the first wave and during the second wave (including shortcomings of the COVID19 emergency management and general indications for increasing resilience against pandemics)

The Italian Health system (i.e. the “National healthcare service” – “Servizio Sanitario Nazionale” – SSN)

- A «universal» system answering to the “right to health” of all the citizens (guaranteed by the Italian Constitution - Art. 32)
- A public system financially supported by taxes and by (mostly) «out of the market» costs of health services
- «Private accredited» health structures are part of the SSN
- Based on high-level provisions/targets at national level (i.e. the Italian Ministry of Health) and with the health services management (and the related budget) assigned to the regional level (**subsidiarity principle**)

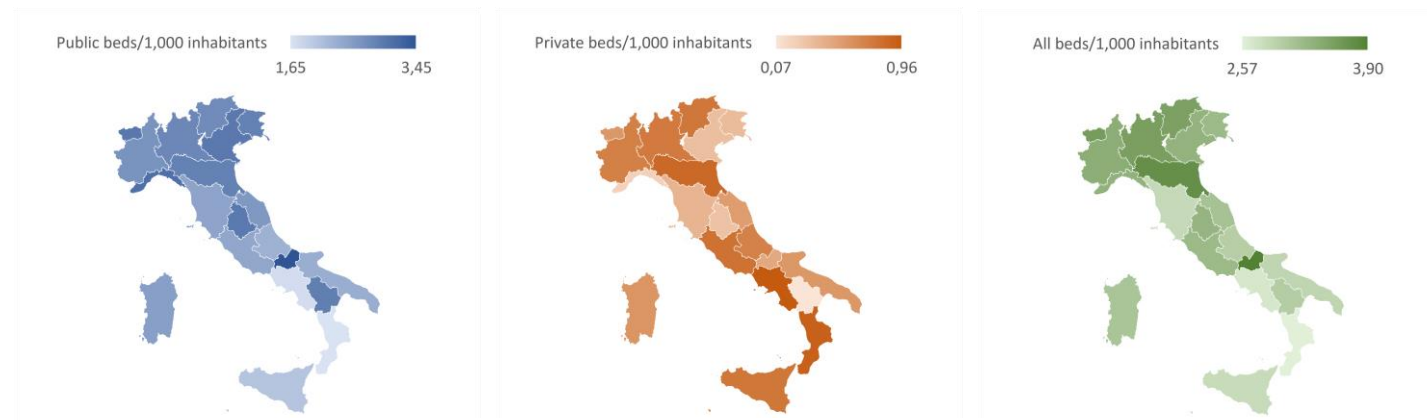
Key figures (2017)

518 public hospitals

with 151.646 beds
(2,5 per 1.000 inhabitants)

482 private «accredited» hospitals

with 40.458 beds
(0,7 per 1.000 inhabitants)



Source: maps created by the authors with data from Ministero della Salute (2019)

Italy has been the “**first mover**” in the COVID19 pandemic for damages, for response and for reaction.

Decreto Presidenza del Consiglio dei Ministri del 08.03.2020 DISPOSIZIONI VALIDE FINO A VENERDI' 3 APRILE 2020	
APERTI E ATTIVI	<ul style="list-style-type: none"> • Farmacie, parafarmacie (anche se nei centri commerciali) • Uffici Comunali • Cimitero • Consegna pasti a domicilio • Assistenza domiciliare • Trasporti sociali • Ambulatori Medici (previo contatto telefonico) • Mercati rionali (vedi limitazioni)
CHIUSI E SOSPESI	<ul style="list-style-type: none"> • Sospensione dell'attività didattica delle Scuole di ogni ordine e grado e degli Asili Nido • Concorsi pubblici • Eventi, congressi, iniziative e attività culturali • Riunioni e assemblee in luogo pubblico o privato • Centri sportivi E palestre • Museo d'Arte Contemporanea • Biblioteca Civica • Cinema e teatri • Pub, Scuole di Ballo, Sale gioco, Sale Scommesse, Discoteche • Centri Benessere • Cerimonie civili e religiose, ivi comprese quelle funebri
CON LIMITAZIONI	<ul style="list-style-type: none"> • Giornate festive e prefestive: chiusura dei negozi all'interno dei centri commerciali (alimentari e farmacie esclusi) • Sabato e domenica chiusura delle medie e grandi strutture di vendita • Mercati consentiti da lunedì a venerdì • Bar e Ristoranti: apertura consentita dalle 6.00 alle 18.00, con obbligo delle distanze di sicurezza (1 mt) e interdizione del servizio al banco; obbligo di chiusura dalle ore 18.00 alle 6.00 del giorno successivo. • Apertura di attività commerciali, supermercati, negozi di vicinato e mercati, sempre condizionata all'adozione di misure organizzative tali da evitare assembramenti di persone • Per i pubblici esercizi confermata l'apertura a condizione di garantire il mantenimento di distanza di almeno metri 1 tra clienti («criterio droplet») • Eventi sportivi e allenamenti a porte chiuse solo per atleti tesserati professionisti.

- **21st February – First official COVID19 case** in Codogno, epidemic outbreak in Vo' Euganeo and first death in Padova
- **22nd February – DPCM*** - Red zone for 10 municipalities in the Province of Lodi and in Vo' Euganeo (in the province of Padova). 76 COVID19 cases
- **24th February – DPCM – Restriction measures** (e.g. education institutions closed) in six Italian regions (Piemonte, Lombardia, Veneto, Friuli-Venezia-Giulia, Emilia Romagna, Liguria)
- **4th March – DPCM - Education institutions closed** in Italy with additional restriction measures (e.g. movie theaters closed)
- **6^h March – The Italian government allocates 7,5 billion euros** to immediately support consumers and enterprises
- **7th March – DPCM – Lombardia and other 14 provinces become red zone.**
- **8th March – DPCM – Restriction measures in all the Italian territories that become red zones for almost one month.** (e.g. only a limited number of commercial activities such as those providing food, drugs remained open).
- **12st March – More than 1,000 deaths** from 21st February
- **18th March – DPCM – “Cura Italia”.** The Italian government allocates 25 billion euro to address the COVID19 emergency. Cemeteries in the Province of Bergamo are no more able to manage deaths. The army is required to transport deaths in other regions.
- **19th March – Italy with 3,405 fatalities** becomes the country with the highest number of COVID deaths in the world.

*Decree of the Presidency of the Council of Ministries

A way to measure the capacity to cope with COVID19 pandemic

→ Intensive case beds

A heterogeneous situation at regional level:

- In absolute terms. **7,092 available intensive care beds** in Italy. From 20 in Valle d'Aosta to 1,036 in Lombardia.
- In relative terms. **From 77 intensive care beds/million inhabitants** in Calabria to **168 intensive care beds/million inhabitants** in Veneto.

Intensive care beds
20 1036



Intensive care beds/
1,000,000 inhabitants 77,67 168,25



Source: maps created by the authors with data from Ministero della Salute (2019)

People in intensive care and deaths in Italy (from 24/02/2020 to 15/11/2020)

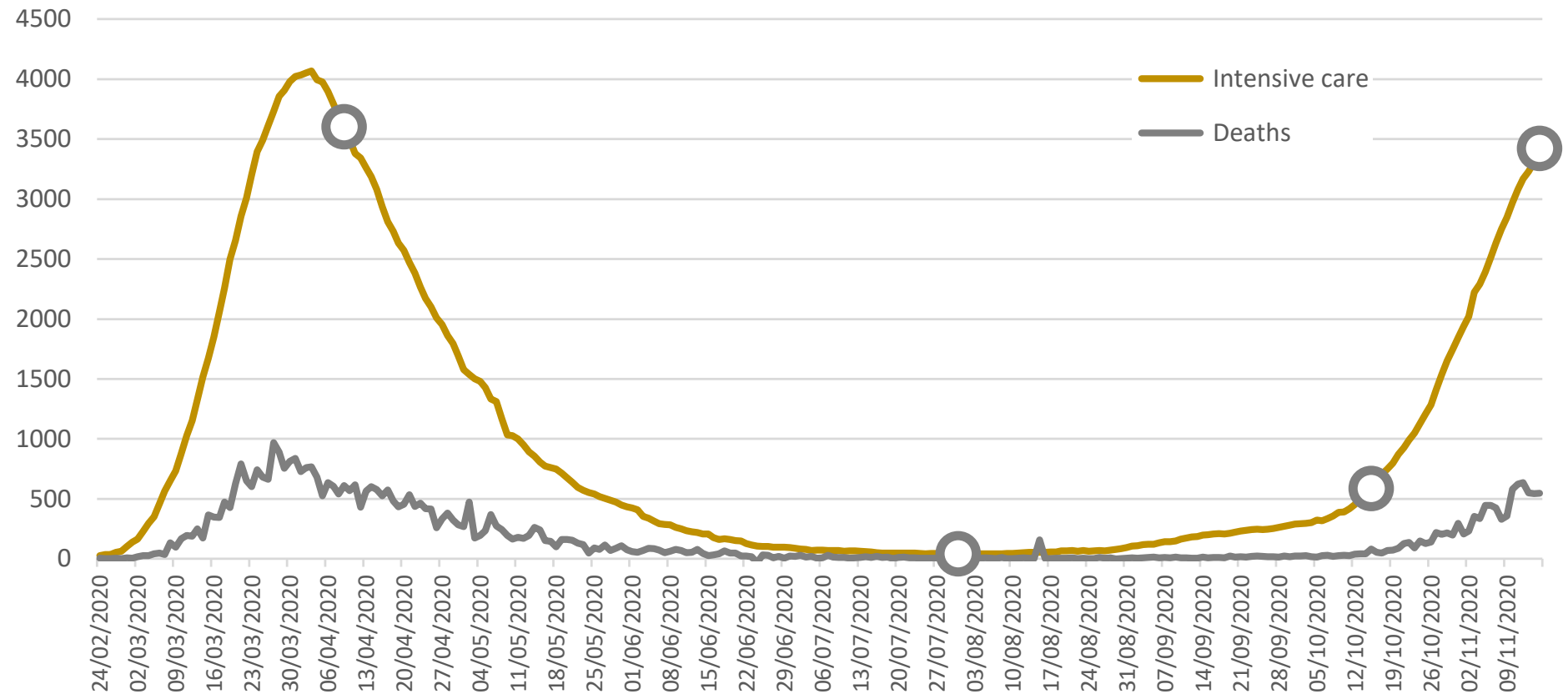
2 waves

made evident by:

- People in intensive care
- # of deaths

Key dates

- 9th April 2020
- 31st July 2020
- 15th October 2020
- 15th November 2020



Source: graph created by the authors with open daily data provided by Protezione Civile

Situation on 9th April 2020 (1,5 months after the first case) → Just after the pick of the first wave

COVID19 deaths (starting from 24th February) → **18,279**.

COVID19-occupied intensive care beds (on 9th April) → **3,605**.

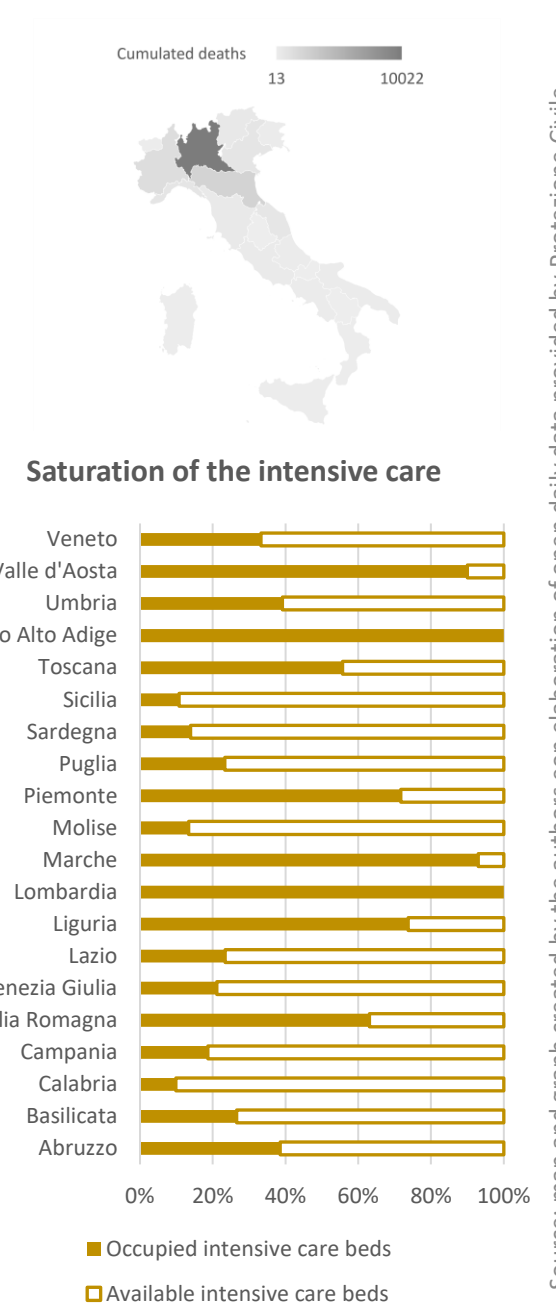
COVID19 cases (starting from 24th February) → **143,626**. The **five most affected regions** (i.e. Lombardia, Emilia Romagna, Piemonte, Veneto and Toscana) registered **74,8% of the total COVID19 cases**. 54.802 cases (38,3%) in Lombardia only.

Response

→ **Lock-down at national level at the beginning of March lasting 2 months** affecting 60 millions people

In the world Italy ranks:

- **3rd for infected cases** (after USA and Spain) (John Hopkins University data)
- **1st for the number of deaths** and with 12,73% as case-fatality ratio (the 1st in the world)



Situation on 31st July 2020 (5 months after the first case) → At the end of the first wave

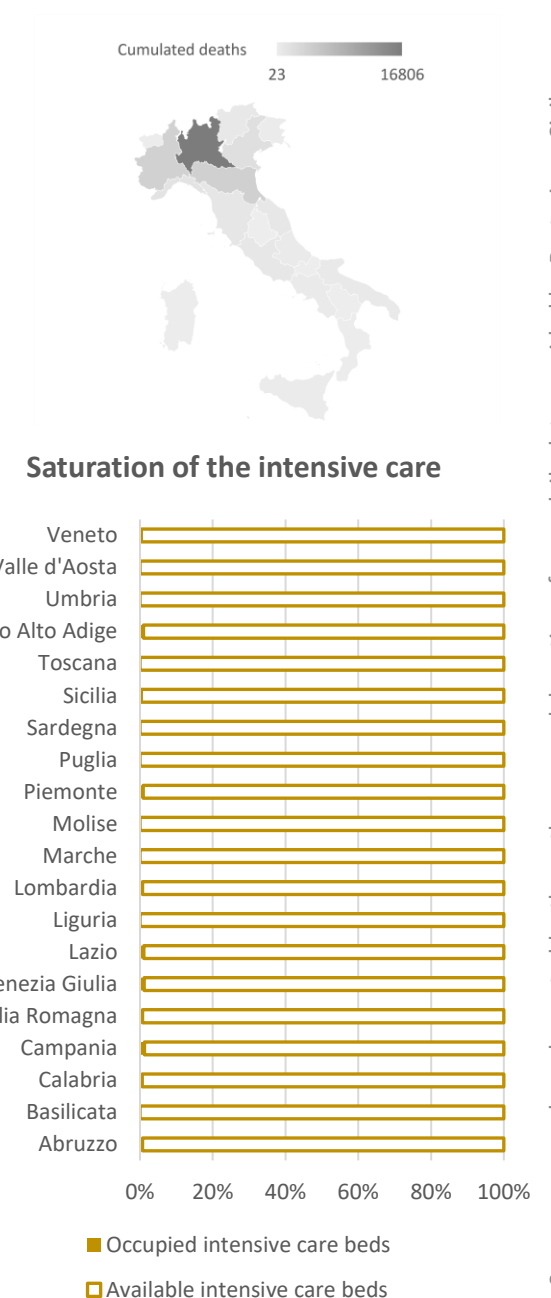
COVID19 deaths (starting from 24th February) → **35,141**.

COVID19-occupied intensive care beds (on 31st July) → **41**.

COVID19 cases (starting from 24th February) → **247,537**. The **five most affected regions** (i.e. Lombardia, Emilia Romagna, Piemonte, Veneto and Toscana) registered **76,0% of the total COVID19 cases**. 96.219 cases (38,9%) in Lombardia only.

Response

→ **Most of the measures to reduce contaminations were gradually relaxed just before the summer period.** Schools and any other education institutions, closed at the beginning of April, re-opened moving around 10 million people (including students, teaching staff and administrative/technical staff) while most of the public administration employees and part of private sector ones continued to work in remote mode.



Situation on 15th October 2020

(8 months after the first case)

→ At the beginning of the second wave

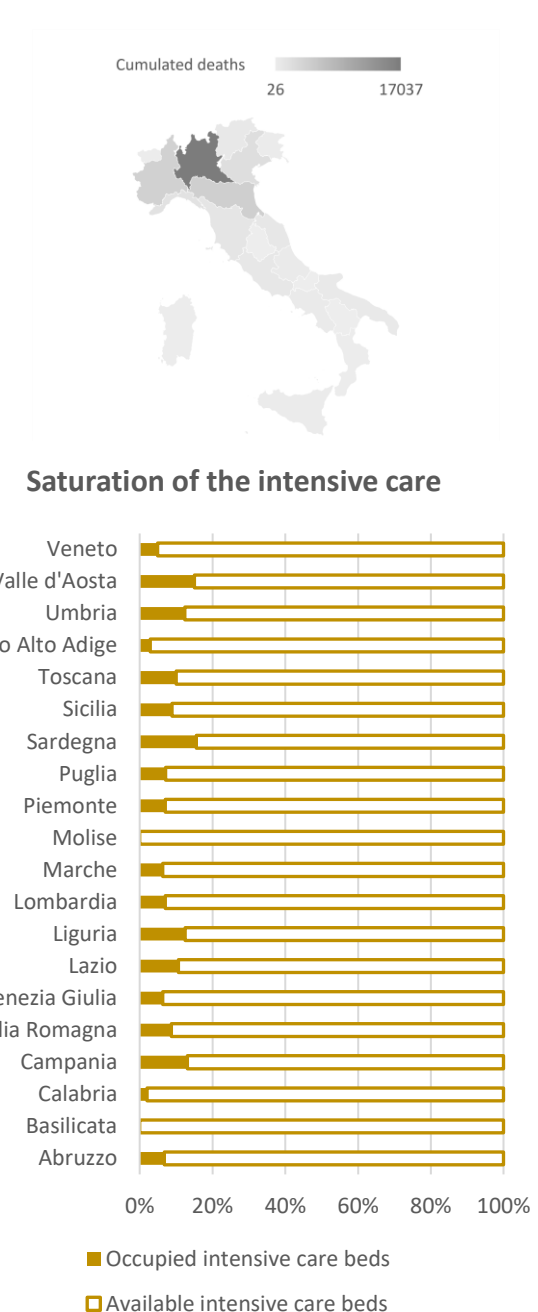
COVID19 deaths (starting from 24th February) → **36,372**.

COVID19-occupied intensive care beds (on 15th October) → **586**.

COVID19 cases (starting from 24th February) → **381,602**. The **five most affected regions** (i.e. Lombardia, Emilia Romagna, Piemonte, Veneto and **Lazio**) registered **66,7% of the total COVID19 cases**. 118.711 cases (31,1%) in Lombardia only.

More recovery than response

→ **Measures to sustain profit losses for enterprises in a number of economic sectors and to sustain citizens.** Schools and any other education institutions remain open. Smart working of public administration is increased.



Situation on 15th November 2020 (9 months after the first case) → At the pick of the second wave (?)

COVID19 deaths (starting from 24th February) → **45,229**.

COVID19-occupied intensive care beds (on 15th November) → **3,422**.

COVID19 cases (starting from 24th February) → **1,178,529**. The **five most affected regions** (i.e. Lombardia, Emilia Romagna, Piemonte, Veneto and **Campania**) registered **63.4% of the total COVID19 cases**. 320.780 cases (27.2%) in Lombardia only.

Response

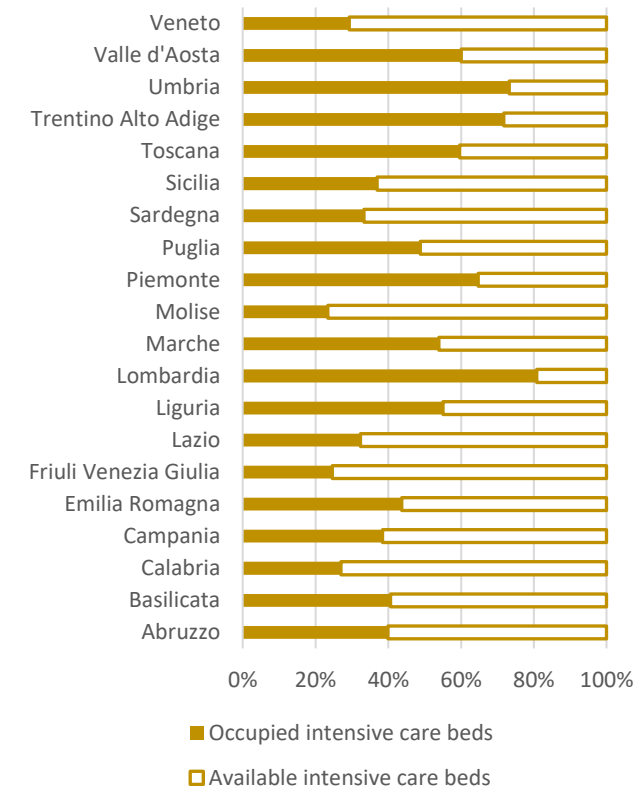
→ **Renewed some of the measures adopted before the summer period with a regional perspective.**

In the world Italy ranks:

- **10th for infected cases** (John Hopkins University data)
- **6th for the number of deaths** and with 3,84% as case-fatality ratio

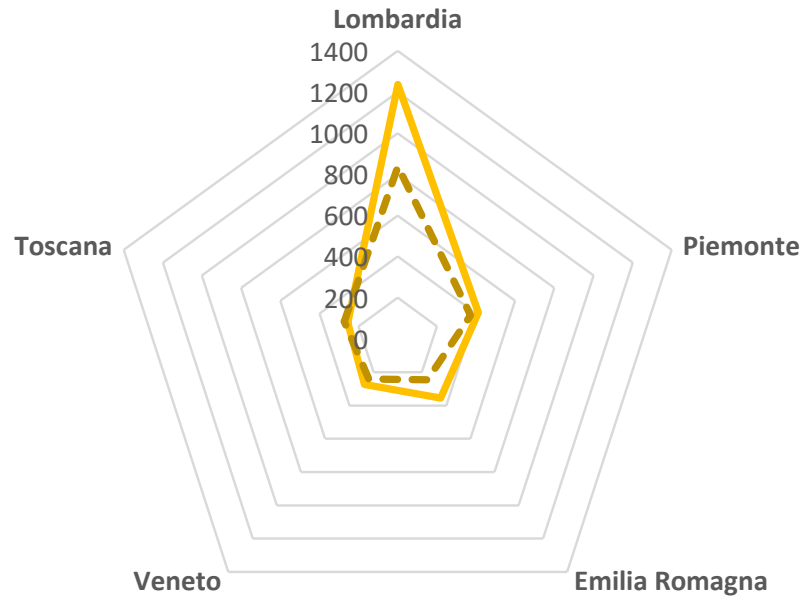


Saturation of the intensive care

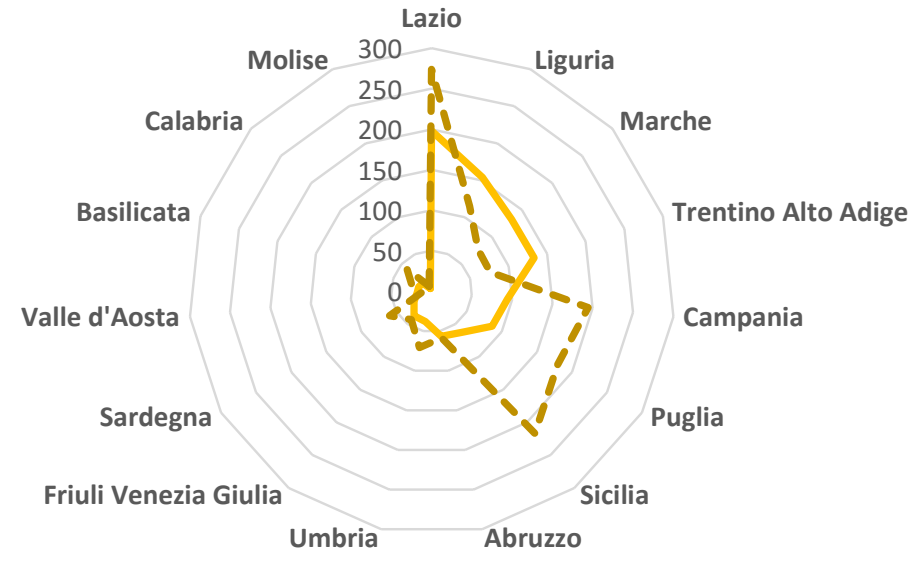


The geographical scope: one of the main difference between the two waves

The 5 regions with the highest # of intensive care (in the first wave)



The # of intensive care in the other 15 regions



— 9th April - - - 15th November

— 9th April - - - 15th November

Source: graphs created by the authors on elaboration of open daily data provided by Protezione Civile

The geographical scope: one of the main difference between the two waves



Source: graphs created by the authors on elaboration of open daily data provided by Protezione Civile

A response to the second wave with an approach at regional level

On 3rd November 2020 application of the **indicators defined by the Ministry of Health** (in the Decree of the Ministry of Health, 30 April 2020).

3 sets of indicators weekly updated with regional data :

- 1. Indicators related to monitoring capacity (6)**
- 2. Indicators related to COVID19 detection and contacts management capacity (6)**
- 3. Indicators related to contamination stability and response capacity of the health services (9)**

With predefined thresholds and critical values to allow a risk assessment based on algorithms taking into account:

- **Likelihood** of contamination (4 levels)
 - **Impact** on citizens' health (4 levels)
- Combined in a **risk matrix defining possible scenarios**

The 21 indicators (Decree of the Ministry of Health, 30 April 2020)

Monitoring capacity (6)	COVID19 detection and contacts management capacity (6)	Contamination stability and response capacity of the health services (9)
<p>1.1 # synthomatic cases reported in the month with the first day of synthoms / total # synthomatic cases reported in the month</p> <p>1.2 # hospitalised cases (not IC) reported in the month with the hospitalisation date / total # hospitalised cases (not IC) reported in the month</p> <p>1.3 # IC cases reported in the month with the IC date / total # IC cases reported in the month</p> <p>1.4 # cases reported in the month with indication of the municipality of residence / total # cases reported in the month</p> <p>1.5 # weekly checklist submitted to healthcare infrastructures (not mandatory)</p> <p>1.6 # healthcare infrastructures answering to the weekly checklist with at least one critical issue (not mandatory)</p>	<p>2.1 % positive tests (excluding repetitions to the same individuals) in the month</p> <p>2.2 Time lag between the first synthomatic day and the date of certification of the COVID19 case</p> <p>2.3 Time lag between the first synthomatic day and the date of isolation (not mandatory).</p> <p>2.4 Professional staff #, type and person/hours in contact-tracing</p> <p>2.5 Professional staff #, type and person/hours in testing, lab analysis, contact tracing of first level and of cases in isolation/quarantine</p> <p>2.6 # new cases identified with contact tracing of first level in the area / total # new cases in the area</p>	<p>3.1 # cases reported in the last 14 days to the Civil Protection</p> <p>3.2 RT based on criteria defined by the Istituto Superiore di Sanità</p> <p>3.3 # cases reported every week to the COVID-net monitoring (not mandatory)</p> <p>3.4 # cases reported every day with certification date and the first synthomatic day</p> <p>3.5 # outbreaks (2 or more connected cases or an unexpeted increase of # cases in an area)</p> <p>3.6 # new cases with known transmission paths</p> <p>3.7 # first-aid patients with COVID19 synthoms (not mandatory)</p> <p>3.8 % of intensive care beds occupied by COVID19 patients</p> <p>3.9 % of beds in healthcare structures occupied by COVID19 patients</p>

Source: Decree of the Ministero della Salute (30 April 2020)

The algorithm for LIKELIHOOD*

1. In the last 5 days have been identified new COVID19 cases in the region?

YES - NO

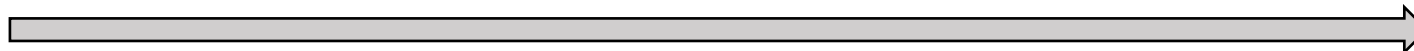


VERY LOW



2. Is there evidence of an increase of contamination (i.e. increasing # cases, $RT > 1$ and/or increase #/size of outbreaks)?

YES - NO

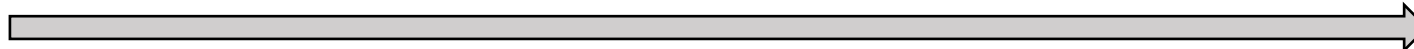


LOW



3. Is there evidence of a contamination path difficult to manage/ contain in an effective way with restriction measures at local level?

YES - NO



MEDIUM



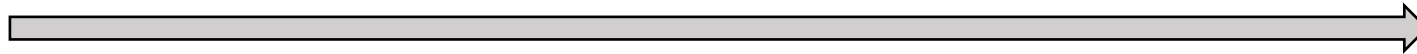
HIGH

*answers based on evidence of a specific sub-set of the 21 indicators.

The algorithm for IMPACT*

1. In the last 5 days have been identified new COVID19 cases of people aged >50 in the region?

YES - NO



VERY LOW



2. Is there evidence of difficulties/saturation of the health services of the region?

YES - NO

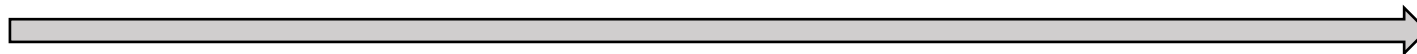


LOW

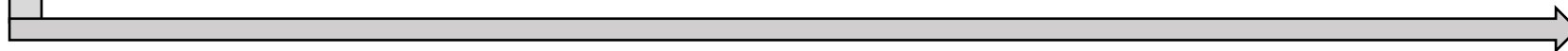


3. Have been identified new outbreaks in retirement homes/hospitals/healthcare structures hosting vulnerable people?

YES - NO



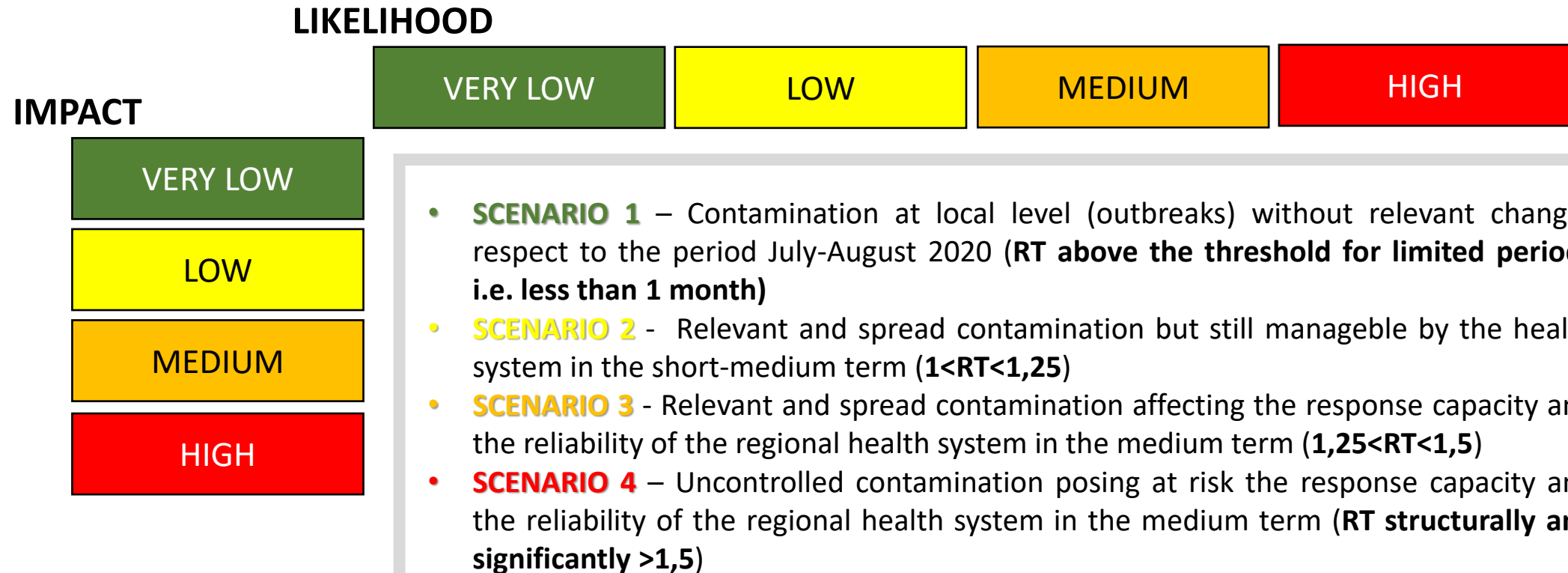
MEDIUM



HIGH

*answers based on evidence of a specific sub-set of the 21 indicators.

The risk matrix and the 4 scenarios



Source: Ministero della Salute, Istituto Superiore di Sanità (2020)

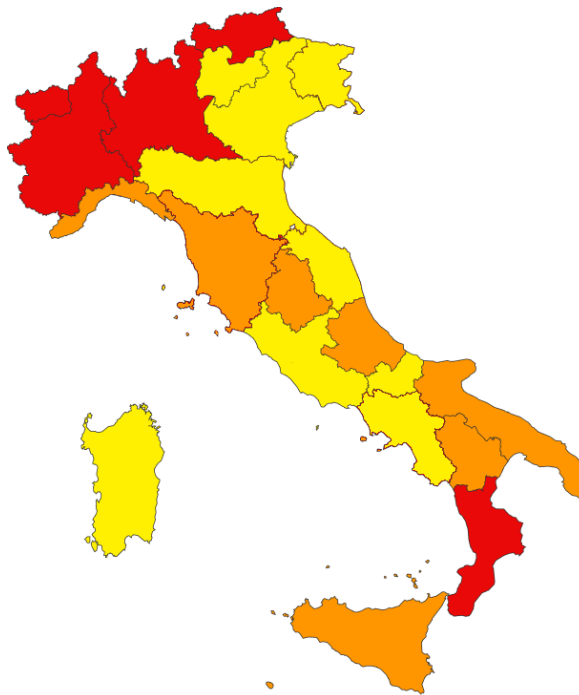
The situation of the Italian regions according to the identified scenarios

9 November



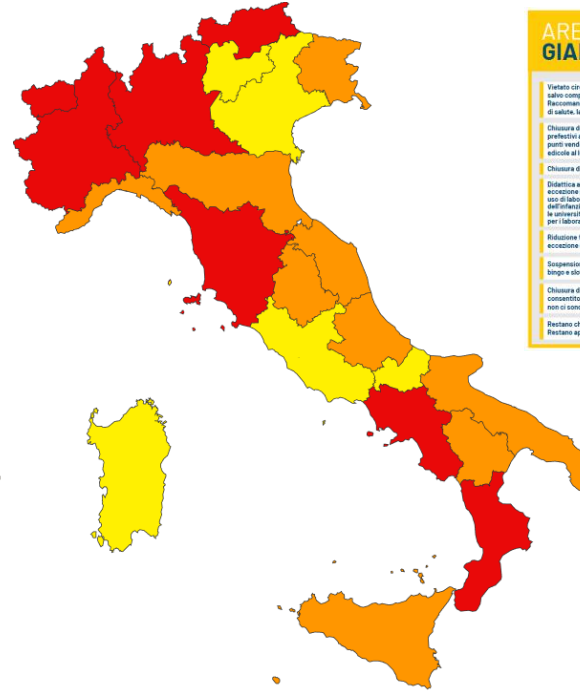
Source: Act of the Ministry of Health (4 November)

12 November



Source: Act of the Ministry of Health (10 November)

15 November



Source: Act of the Ministry of Health (13 November)

AREA GIALLA	AREA ARANCIONE	AREA ROSSA
<p> Vietato circolare dalle ore 22 alle ore 5 del mattino, salvo comprovati motivi di lavoro, necessità o salute. Raccomandazione di non spostarsi se non per motivi di salute, lavoro, studio, situazioni di necessità.</p> <p> Chiusura dei centri commerciali nei giorni festivi e prefestivi ad eccezione delle farmacie, parafarmacie, punti vendita di generi alimentari, tabaccherie ed edicole al loro interno.</p> <p> Chiusura di musei e mostre.</p> <p> Didattica a distanza per le scuole superiori, fatta eccezione per gli studenti con disabilità e in caso di uso di laboratori; didattica in presenza per scuole dell'infanzia, scuole elementari e scuole medie. Chiusa le università, salvo alcune attività per le matricole e per i laureandi.</p> <p> Riduzione fino al 50% per il trasporto pubblico, ad eccezione dei mezzi di trasporto scolastico.</p> <p> Sospensione di attività di sale giochi, sale scommesse, bingo e slot machine anche nei bar e tabaccherie.</p> <p> Chiusura di bar e ristoranti alle ore 18. L'apporto è consentito fino alle ore 12. Per la consegna a domicilio non ci sono restrizioni.</p> <p> Restano chiuse piscine, palestre, teatri, cinema. Restano aperti i centri sportivi.</p>	<p> Vietato circolare dalle ore 22 alle ore 5 del mattino, salvo comprovati motivi di lavoro, necessità o salute.</p> <p> Vietati gli spostamenti in entrata e in uscita da una Regione all'altra e da un Comune all'altro, salvo comprovati motivi di lavoro, studio, salute, necessità. Raccomandazione di evitare spostamenti non necessari nell'entroterra della giornata all'interno del proprio Comune.</p> <p> Chiusura di bar e ristoranti, 7 giorni su 7. L'apporto è consentito fino alle ore 12. Per la consegna a domicilio non ci sono restrizioni.</p> <p> Chiusura dei centri commerciali nei giorni festivi e prefestivi ad eccezione delle farmacie, parafarmacie, punti vendita di generi alimentari, tabaccherie ed edicole al loro interno.</p> <p> Chiusura di musei e mostre.</p> <p> Didattica e distanza per le scuole superiori, fatta eccezione per gli studenti con disabilità e in caso di uso di laboratori; didattica in presenza per scuole dell'infanzia, scuole elementari e scuole medie. Chiusa le università, salvo alcune attività per le matricole e per i laureandi.</p> <p> Riduzione fino al 50% per il trasporto pubblico, ad eccezione dei mezzi di trasporto scolastico.</p> <p> Sospensione di attività di sale giochi, sale scommesse, bingo e slot machine anche nei bar e tabaccherie.</p> <p> Restano chiuse piscine, palestre, teatri, cinema. Restano aperti i centri sportivi.</p>	<p> È vietato ogni spostamento, anche all'interno del proprio Comune, in qualsiasi orario, salvo che per motivi di lavoro, necessità o salute: vietati gli spostamenti da una Regione all'altra e da un Comune all'altro.</p> <p> Chiusura di bar e ristoranti, 7 giorni su 7. L'apporto è consentito fino alle ore 12. Per la consegna a domicilio non ci sono restrizioni.</p> <p> Chiusura dei negozi, fatta eccezione per i supermercati, beni alimentari e di necessità.</p> <p> Restano aperte edicole, tabaccherie, farmacie e parafarmacie, selettorie, parrucchiere e barbieri. Chiusi i centri estetici.</p> <p> Didattica a distanza per le scuole secondarie di secondo grado, per le classi di seconda e terza media. Restano aperte, quindi, solo le scuole dell'infanzia, le scuole elementari e la prima media. Chiusa le università, salvo specifiche eccezioni.</p> <p> Sono sospese tutte le competizioni sportive salvo quelle riconosciute di interesse nazionale dal CONI e CIP. Sospesa la attività nei centri sportivi. Rimane consentito svolgere attività motoria nei pressi delle proprie abitazioni e attività sportiva solo all'aperto in forma individuale.</p> <p> Sono chiusi musei e mostre; chiusi anche teatri, cinema, palestre, attività di sale giochi, sale scommesse, bingo, anche nei bar e nelle tabaccherie. Per i mezzi di trasporto pubblico è consentito il riempimento solo fino al 50%, fatta eccezione per i mezzi di trasporto scolastico.</p>

Lessons learnt after the first wave

To understand and better address socio-economic challenges of a **possible second wave**:

- Measures for the **health system**
 - Define for emergency situations **light/ad-hoc procurement procedures**
 - Improve/increase the **existing equipment for intensive care**
 - Create an **effective system to track contacts**
- Measures for **citizens and enterprises**
 - Impose **restrictions where they really are needed** to avoid negative side-effects
 - Improve/simplify **mechanisms/procedures to support from the economic point of view affected citizens and enterprises**
 - Favour the **societal digitalization**

A shortcoming in the COVID19 emergency management

The IMMUNI app for Contact Tracking

When two IMMUNI users (user A and user B) meet, terminal (e.g. smart phone) of user A issues **an anonymous key via Bluetooth** including a specific ID of the contact event together with an assessment of the distance between User A and User B. Terminal of User B behaves in the same way. Each of the two terminals stores the other user's key.

If later one of two users (e.g. User A) results a potential COVID19 case, his/her keys (together with a **contamination factor**) are uploaded on an ad-hoc central server. All the keys are regularly downloaded by the IMMUNI app of all the users.

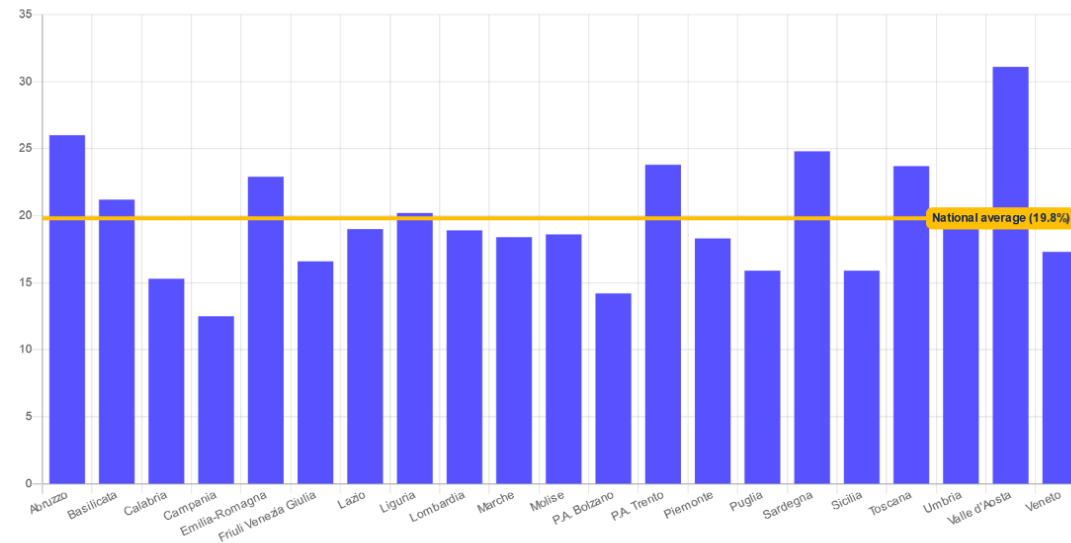
All the IMMUNI users having stored keys generated by contact events with User A → informed of a **potential contact with a COVID19 case** with a precise **level of health risk** ranging from 1 to 8 (the **contamination factor** is one of the elements defining the level of the health risk).

On 15th November:

- Around 9 million of users
- 19.8% of downloads over the number of inhabitants
- 275 notifications
- 100 positive users
- 76687 notifications (from 15 June 2020)
- 4155 positive users (from 15 June 2020)



Percentage of downloads over number of inhabitants



Projection made by the Ministry of Health updated to 15/11/2020.

Lessons learnt during the second wave

To understand and better address socio-economic challenges of a **new world with a persistent COVID19 threat**:

- Measures for the **health system**
 - Address in the medium term an **increased structural need for specialized health staff** (i.e. intensive care doctors)
 - Guarantee **first aid/care also for the other/not COVID19 patients**
- Measures for **citizens and enterprises**
 - Improve the **public urban transport system**
 - Define **medium-term incentives/strategies to support the economic recovery**
 - Favour the **green transition and societal revitalization of non-urban areas**

A shortcoming in the COVID19 emergency management

Procedures in urgency to find medical/health staff

- 24 October 2020: **call for medical/health staff (1,500 units)** and for administrative staff (500 units) to generally address the COVID19 emergency and to enforce the contact tracing.
- 18 November 2020: **call for specialised medical/health staff (160 units)** to address the COVID19 emergency in the Campania region.
- 20 November 2020: **call for specialised medical/health staff (200 units)** to address the COVID19 emergency to support regional health systems.



Medici a supporto delle strutture sanitarie delle Regioni e Province Autonome per Covid-19

[Procedura per l'individuazione di n. 200 medici da destinare alle Regioni e Province Autonome per la gestione dei casi di COVID -19](#)

Al fine di garantire una più efficace gestione dell'emergenza epidemiologica dei casi di Covid - 19 sul territorio nazionale, per il supporto delle attività delle Aziende sanitarie ed ospedaliere, anche nei reparti Covid, il Dipartimento della protezione civile emana il presente avviso volto a raccogliere manifestazioni di interesse per l'individuazione di 200 medici laureati ed abilitati all'esercizio della professione, compresi medici specializzati in anestesia e rianimazione, malattie infettive, malattie dell'apparato respiratorio, medicina e chirurgia d'accettazione e d'urgenza.

Apertura: 20/11/2020 12:00 - Chiusura: 23/11/2020 20:00

Accedi

Source: Website of the Italian National Civil Protection (22 November 2020)

Lessons learnt

- **New awareness of the pandemic risk** and a greater probability of occurrence respect to what was previously perceived
- **New communication approaches** to properly inform about the pandemic risk:
 - All the population (regardless e.g. age, cultural diversity, social status)
 - Reducing the distorting effects of deniers/conspiracy theorists
- **New policies and new tools to activate supervisory strategies at national/regional level** to improve the resilience of the territorial system towards risks relating to the health sector

→ To increase **resilience** → various phases of risk management, in particular on the central phases (prevention, mitigation, response)

- "ordinary times"
- management of moments of crisis (Emergency Management)

Precursors of pandemic phenomena, although being weak and delocalized → recognized and taken out of the "health noise"

→ **coordinated at national level** to allow the adoption of warning measures, an in-depth analysis and, in the case, a definition of timely containment actions.

Sources and references

- IMMUNI website, <https://www.immuni.italia.it/>
- Ministero della Salute (2019), «Annuario Statistico del Servizio Sanitario Nazionale. Assetto organizzativo, attività e fattori produttivi del SSN. Anno 2017», http://www.salute.gov.it/imgs/C_17_pubblicazioni_2879_allegato.pdf
- Protezione Civile – Open data. <https://github.com/pcm-dpc/COVID-19>
- Ministero della Salute, Istituto Superiore di Sanità (2020), «Prevenzione e risposta a COVID-19: evoluzione della strategia e pianificazione nella fase di transizione per il periodo autunno-invernale», <https://www.trovanorme.salute.gov.it/norme/renderNormsanPdf?anno=2020&codLeg=76597&parte=1%20&serie=null>
- Webpage of the Italian Civil Protection for the calls aimed at recruiting medical/health staff <https://mediciperCovid.protezionecivile.it/>
- Webpage of the Ministry of Health collecting all the Decrees of the Ministry of Health, <http://www.salute.gov.it/portale/nuovocoronavirus/dettaglioContenutiNuovoCoronavirus.jsp?lingua=italiano&id=5351&area=nuovoCoronavirus&menu=vuoto>
- Webpage of the Ministry of Health collecting general information on COVID19 in Italy, <http://www.salute.gov.it/portale/nuovocoronavirus/homeNuovoCoronavirus.jsp>



Citizens and cities facing new hazards and threats

30th November to 4th December 2020

Thank you for your attention!

Simona Cavallini

Sandro Bologna

Carmelo Di Mauro

Vittorio Rosato

TIEMS Italian Chapter

<http://www.tiemsitalianchapter.it>