



# Presidenza del Consiglio dei Ministri

DIPARTIMENTO DELLA PROTEZIONE CIVILE

COMITATO TECNICO SCIENTIFICO EX OO.C.D.P.C. 03/02/2020, N. 630; 18/04/2020, N. 663; 15/05/2020, N. 673

Verbale n. 102 della riunione tenuta presso il Dipartimento della Protezione Civile, il giorno 26 agosto 2020

	PRESENTE	ASSENTE
Dr Agostino MIOZZO	X	
Dr Fabio CICILIANO	X	
Dr Massimo ANTONELLI	X	
Dr Giovannella BAGGIO	IN VIDEOCONFERENZA	
Dr Roberto BERNABEI	X	
Dr Silvio BRUSAFERRO	IN VIDEOCONFERENZA	
Dr Elisabetta DEJANA	IN VIDEOCONFERENZA	
Dr Mauro DIONISIO	IN VIDEOCONFERENZA	
Dr Ranieri GUERRA	IN VIDEOCONFERENZA	
Dr Achille IACHINO	IN VIDEOCONFERENZA	
Dr Sergio IAVICOLI	X	
Dr Giuseppe IPPOLITO	X	
Dr Franco LOCATELLI		X
Dr Nicola MAGRINI	PRESENTE Ammassari in rappresentanza di AIFA	
Dr Francesco MARAGLINO	IN VIDEOCONFERENZA	
Dr Rosa Marina MELILLO	IN VIDEOCONFERENZA	
Dr Nausicaa ORLANDI	IN VIDEOCONFERENZA	
Dr Flavia PETRINI	IN VIDEOCONFERENZA	
Dr Kyriakoula PETROPULACOS	IN VIDEOCONFERENZA	
Dr Giovanni REZZA	X	
Dr Luca RICHELDI	X	
Dr Giuseppe RUOCCO		X
Dr Nicola SEBASTIANI	X	
Dr Andrea URBANI	IN VIDEOCONFERENZA	
Dr Alberto VILLANI	IN VIDEOCONFERENZA	
Dr Alberto ZOLI	IN VIDEOCONFERENZA	

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È presente il capo di gabinetto del Ministero della Salute (in videoconferenza).

È presente la Dr Adriana Ammassari in rappresentanza di AIFA.

È presente il Dr Luigi Bertinato di ISS.

È presente il Dr Paolo D'Ancona di ISS (in videoconferenza).

La seduta inizia alle ore 15,15.

## TRASMISSIONE DATI EPIDEMIOLOGICI EX ART. 1 CO. 16 DEL DL 16/05/2020, N. 33

Il CTS acquisisce i dati epidemiologici relativi all'aggiornamento sull'evoluzione della pandemia e del monitoraggio della fase di transizione con i relativi dati di pertinenza delle Regioni e delle Province Autonome (allegato).

## TRASPORTO PUBBLICO LOCALE E TRASPORTO URBANO NELLA CONTINGENZA DELLA RIPRESA DELLE ATTIVITÀ PRODUTTIVE E DELLA RIPRESA DELLE ATTIVITÀ DIDATTICHE DELLE SCUOLE DI OGNI ORDINE E GRADO

Il CTS, al fine di acquisire informazioni sull'analisi dell'impatto globale dei trasporti pubblici locali ed urbani relativamente alle misure di contenimento dell'epidemia da SARS-CoV-2 nell'approssimarsi della data di inizio del prossimo anno scolastico e della ripresa delle attività produttive escluse dalla possibilità di lavoro agile (c.d. *smart working*), acquisisce il documento "Contributo tecnico congiunto ANCI Regioni sulle problematiche del trasporto pubblico locale e scolastico causate dal COVID19" (allegato) trasmesso dal Ministero delle Infrastrutture e dei Trasporti in data 13/08/2020.

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Al riguardo, il testo, oltre a contenere tematiche politico-economiche non di competenza del CTS quali la stima di risorse aggiuntive necessarie a garantire il Trasporto Pubblico Locale (TPL), affronta temi relativi alle disposizioni in atto per garantire il distanziamento a bordo dei mezzi di trasporto e la prevenzione dell'affollamento e la loro compatibilità con le necessità di garantire il trasporto all'utenza illustrando, in particolare, diverse criticità in funzione della riapertura delle scuole nel prossimo anno scolastico, che andrebbero a sommarsi – in termini di utilizzo del trasporto pubblico locale – al traffico generato dalla ripresa delle altre attività economiche già avvenuta nei mesi scorsi.

In particolare, viene sostenuto che *“Per quanto riguarda le misure da applicare, si fa presente che il mantenimento della regola del distanziamento, con le attuali deroghe permette una capienza del TPL al massimo al 60%, che nell'urbano dove il maggior numero delle persone si muove in piedi, si riduce ulteriormente al 50%. Ciò significa o raddoppiare il servizio, complesso in termini organizzativi e di risorse, oppure lasciare a casa la metà degli studenti, nonché aumentare notevolmente il traffico privato congestionando le città e aumentando i livelli di inquinamento, costringendo metà degli utilizzatori del TPL ad utilizzare l'automobile privata. Ad esempio, in città come Roma, Milano o Napoli significherebbe, mediamente, oltre mezzo milione di automobili in più. In città come Venezia peraltro, per i collegamenti via acqua, potrebbero non esserci mezzi privati disponibili”*.

Al riguardo, il documento non offre elementi valutativi su come si sia giunti all'assunto dello scenario che rischierebbe di lasciare *“a casa la metà degli studenti”* a causa del mantenimento delle misure contenitive attuali per la prevenzione della diffusione del contagio da SARS-CoV-2.

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Con lo scopo di approfondire ulteriormente le informazioni relative alle modalità organizzative miranti al rispetto delle misure precauzionali per le azioni di contenimento del contagio nel trasporto pubblico locale ed urbano, il CTS ha partecipato ad un tavolo tecnico richiesto dal Ministero delle Infrastrutture e dei Trasporti a cui hanno aderito rappresentanti del MIT, delle Regioni, delle Province e dei Comuni. In quella sede, l'analisi della complessa tematica relativa ai trasporti ha messo in evidenza, sostanzialmente, la impossibilità di adozione di soluzioni organizzative che potessero affrontare in maniera organica e coordinata la problematica, nonostante il CTS avesse già messo in evidenza – fin dallo scorso mese di aprile – l'esigenza di identificare differenti ed adeguate misure di sistema e/o modalità organizzative da parte degli Enti e delle Istituzioni coinvolte. In questa maniera, si sarebbe potuto assicurare con congruo anticipo il diritto alla mobilità dei cittadini, contemperando l'adozione di corrette misure di contenimento del contagio per garantire il più alto livello di sicurezza sanitaria, in coerenza con il principio di massima precauzione.

Più specificamente, fin dalla seduta n. 55 del 18/04/2020, il CTS ha sottolineato l'esigenza di un nuovo approccio metodologico per affrontare al meglio la ripresa del pendolarismo nella contingenza epidemica da SARS-CoV-2 con la formulazione di determinate raccomandazioni di sistema, organizzative e di prevenzione per la ripresa della fruizione dei mezzi di trasporto pubblico – peraltro riprese da una specifica circolare del Ministero della Salute (Circolare n. 14916 del 29/04/2020) – rilevando altresì che ISTAT, relativamente alla distribuzione degli utenti dei mezzi pubblici, ha evidenziato che, tra questi, la percentuale degli studenti risulta compresa tra il 13,7 e il 24,7% e che oltre la metà di questi impiega meno di 30 minuti nello spostamento con i mezzi pubblici per raggiungere la scuola. La maggioranza degli studenti che

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impiega il TPL nel tragitto casa-scuola e viceversa frequenta le scuole secondarie di secondo grado.

Già allora, il CTS rimarcò come l'intero sistema di trasporto pubblico dovesse essere considerato un contesto a rischio di aggregazione medio-alto, con possibilità di rischio alto nelle ore di punta, soprattutto nelle aree metropolitane ad alta urbanizzazione, a causa dell'alto numero di persone concentrate in spazi limitati con scarsa ventilazione, della mancanza di controllo degli accessi per identificare soggetti potenzialmente infetti, della elevata possibilità di venire in contatto con superfici potenzialmente contaminate in quanto comunemente toccate (distributori automatici di biglietti, corrimano, maniglie, etc.).

Fu chiaramente ribadita la necessità di *"mettere in pratica una efficace riorganizzazione del sistema di trasporto pubblico, nell'ottica della ripresa del pendolarismo, anche garantendo la tutela della salute del personale addetto nelle stazioni e sui mezzi di trasporto, per sostenere la ripresa delle attività e quindi della mobilità delle persone attraverso la gestione efficiente delle criticità legate ai rischi di affollamento e di esposizione a possibili fonti di contagio"*.

Successivamente, nel "Documento Tecnico sull'ipotesi di rimodulazione delle misure contenitive nel settore scolastico" approvato nella seduta n. 82 del 28/05/2020, il CTS indicava, tra l'altro che: *"Tra le misure di sistema è necessario valutare anche l'eventuale impatto degli spostamenti correlati con la mobilità degli studenti. I dati ISTAT riportati nel "Documento tecnico sull'ipotesi di rimodulazione delle misure contenitive in relazione al trasporto pubblico collettivo terrestre, nell'ottica della ripresa del pendolarismo, nel contesto dell'emergenza da SARS-CoV-2" [cfr. verbale CTS n. 57 del 22/04/2020] evidenziano elementi di criticità nelle grandi aree metropolitane, durante le giornate lavorative, nelle fasce orarie di punta del mattino*

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*e del pomeriggio, con profili giornalieri confermati anche dall'elaborazione dei dati di telefonia mobile delle principali città italiane. Pertanto, tra le azioni di sistema si ritiene opportuno valutare, per le scuole secondarie di II grado dei grandi centri urbani, una differenziazione dell'inizio delle lezioni al fine di contribuire alla riduzione del carico sui mezzi di trasporto pubblico nelle fasce orarie di punta (tra le 7:00 e le 8:30)".*

Per ciò che concerne l'ambito occupazionale, ECDC rileva che tra i lavoratori del settore dei trasporti si sono evidenziati alcuni cluster epidemici sulla base dei dati raccolti a livello europeo.

In ambito nazionale, sia i dati assicurativi di INAIL che quelli di Letteratura mostrano in Italia un numero limitato di focolai di infezione in lavoratori del settore del trasporto pubblico. Tuttavia, è da sottolineare che molti di questi dati sono correlabili a scenari in cui l'utilizzo del trasporto era estremamente ridotto, come durante la fase di *lockdown* o comunque connessi alle misure di contenimento, confermando la rischiosità del settore.

L'uso delle mascherine introdotto nel trasporto pubblico costituisce sicuramente una misura di grande importanza per il contenimento del rischio di trasmissione, pur rimanendo il distanziamento la misura cardine per la prevenzione del contagio, come sottolineato anche dalle Linee Guida sulla progressiva riattivazione dei servizi di trasporto e di connettività della Commissione Europea "*Communication from the Commission. Guidelines on the progressive restoration of transport services and connectivity COVID-19 2020/C 169/02*" (allegato) che, nella sezione dedicata alla protezione dei viaggiatori, specificano che le misure di distanziamento fra passeggeri devono essere applicate finché la condizione sanitaria lo richiede, adottando misure di protezione aggiuntive (come l'uso di mascherina, la riduzione del numero dei passeggeri, il posizionamento di barriere protettive per i conducenti dei mezzi di

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trasporto o nelle biglietterie, ecc.) quando non sia possibile garantire un adeguato distanziamento fisico.

Le medesime Linee Guida, inoltre, quando siano disponibili diverse alternative di trasporto, sottolineano l'opportunità di prediligere la modalità che possa garantire il distanziamento in maniera più efficace.

Analogamente, nel documento "*COVID-19 in children and the role of school settings in COVID-19 transmission*" di ECDC (allegato), viene sottolineato il rischio di affollamento dei mezzi di trasporto in relazione alla mobilità degli studenti che rientrano a scuola, richiamando l'importanza delle misure di distanziamento, dell'indossare correttamente la mascherina e della frequente pulizia e disinfezione delle superfici a bordo dei mezzi di trasporto pubblico.

Pertanto, nel rilevare che il livello di rischio di contagio risulta significativamente più elevato a causa dell'applicazione solo parziale delle raccomandazioni e delle indicazioni fornite al tempo dal CTS, nella considerazione della necessità di concretizzare comunque una pianificazione operativa nel breve periodo, il Comitato Tecnico Scientifico rappresenta l'urgenza di intraprendere un percorso metodologico – comunque rimesso alla responsabilità delle competenti Autorità locali e Nazionali – che contemperi, da un lato, il rigoroso rispetto delle misure di contenimento da parte degli attori del mondo del trasporto pubblico (passeggeri, autisti, macchinisti, verificatori, controllori ed altro personale viaggiante), dall'altro, l'ottimizzazione delle modalità organizzative e di sistema per la migliore fruizione del trasporto pubblico locale ed urbano da parte dei cittadini che, a mero titolo di esempio, comunque non esaustivo, si riportano di seguito:

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- Assoluto rispetto dell'uso delle mascherine che devono essere correttamente indossate per l'intero tragitto (che devono essere già indossate all'atto della salita e della discesa dal mezzo di trasporto pubblico);
- Ricorso ai *mobility managers*, tenuti per norma a monitorare i dati relativi alla mobilità cittadina e metropolitana) per la riorganizzazione delle corse, dei percorsi e degli orari dei mezzi di trasporto pubblico locale ed urbano;
- Incremento del numero dei mezzi di trasporto, anche attraverso il ricorso a soluzioni di contingenza (NCC, noleggio da rimessa, ecc.);
- Aumento delle corse dei mezzi di trasporto pubblico, soprattutto durante le ore di punta;
- Riorganizzazione degli orari di ingresso e di uscita delle scuole e delle attività produttive, al fine di ridurre la concentrazione e l'aggregazione di cittadini nei periodi di punta;
- Impiego a bordo dei mezzi di dispenser per la distribuzione di soluzioni idro-alcooliche per la frequente detersione delle mani;
- Immediata predisposizione di separatori, anche monouso, costituiti da materiali idonei alla interruzione delle proiezioni del *droplet*, facilmente sanificabili, realizzati con materiali non infiammabili e, comunque, che rispondano ai criteri di sicurezza nei trasporti per consentirne l'omologazione della Direzione Generale della Motorizzazione Civile;
- Organizzazione di percorsi di salita e di discesa separati e differenziati (per il TPL extraurbano, attendere che ciascun passeggero salito si sia seduto, prima di consentire la salita al passeggero successivo; analoga procedura deve essere osservata alla discesa dei passeggeri: il passeggero non potrà alzarsi dal posto per

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lasciare il mezzo di trasporto prima che il passeggero precedente non ne sia completamente disceso);

- Riduzione dei tempi di percorrenza;
- Mantenimento in esercizio degli impianti di aerazione senza ricircolo;
- Apertura dei finestrini dei mezzi di trasporto, al fine di favorire il ricambio dell'aria;
- Puntuale igienizzazione dei mezzi di trasporto;
- Sollecitazione alla diffusione ed all'utilizzo dell'App IMMUNI;
- Monitoraggio della circolazione del virus SARS-CoV-2 nel territorio regionale/provinciale/comunale, al fine di consentire alle Autorità locali di intraprendere tempestivi provvedimenti in caso di significativi incrementi degli indici epidemiologici;
- Ogni altra misura atta a garantire i principi fondamentali di prevenzione del contagio da SARS-CoV-2.

Ulteriori elementi di valutazione che, rispetto agli scenari antecedenti all'insorgenza dell'emergenza pandemica da SARS-CoV-2 vanno tenuti in considerazione per stimare gli scenari di utilizzo del TPL, sono rappresentanti da:

- Permanenza in modalità *smart working* di oltre il 50% dei dipendenti pubblici e di un numero non trascurabile nel settore privato;
- Drastica riduzione del turismo internazionale;
- Differenziazione-flessibilità degli orari delle attività produttive finalizzate alla riduzione dell'ora di punta in connessione con il pendolarismo;
- Organizzazione in turni degli orari scolastici;
- Ricorso alla didattica a distanza.

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Il CTS rimarca quanto raccomandato relativamente al rigoroso rispetto del distanziamento fisico (inteso come distanza minima di 1 metro fra i passeggeri) che rimane uno dei punti di primaria importanza nelle azioni di prevenzione del contenimento epidemico insieme all'impiego delle mascherine, delle misure organizzative e di prevenzione e protezione ed alla frequente igienizzazione delle mani.

Il CTS ribadisce, altresì, che solo in situazioni di assoluta eccezionalità e solo quando tutte le altre iniziative sopra descritte non si siano potute intraprendere (condizioni comunque che, con gli attuali indici epidemiologici, devono essere considerate assolutamente residuali), nel rispetto della gerarchia delle azioni organizzative e di prevenzione e protezione sopra illustrate atte a prevenire l'affollamento, in considerazione delle evidenze scientifiche sull'assunto dei tempi di permanenza medi dei passeggeri indicati dai dati disponibili, potrebbe prendersi in considerazione un indice di riempimento fino ad un massimo pari al 75% della capienza omologata del mezzo di trasporto, prevedendo una maggiore riduzione dei posti in piedi rispetto a quelli seduti.

Il CTS sottolinea comunque la possibilità di indicazioni più restrittive al riempimento dei mezzi sulla base dell'andamento degli indicatori epidemiologici a livello locale da parte dell'Autorità sanitaria competente.

Il CTS, quando possibile, raccomanda comunque fortemente l'incentivazione della mobilità sostenibile (biciclette, e-bike, ecc.). Al riguardo, le conferenze di servizi previste dalle Linee Guida del Piano Scuola 2020-2021 emanate dal Ministero dell'Istruzione prevedevano specifici raccordi fra le autorità locali.

Le misure adottate in alcuni contesti metropolitani sulla differenziazione degli orari di apertura degli esercizi commerciali e delle attività produttive contribuiscono altresì

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nell'ottica complessiva del contenimento del contagio e, al riguardo, il CTS rileva, a titolo di esempio, l'accuratezza del progetto di studio previsionale sviluppato da Roma Mobilità in collaborazione con le Università degli Studi di Roma Sapienza, Tor Vergata e Roma Tre che offre interessanti spunti prevedendo diversi scenari di impatto sul TPL connessi alla ripresa della scuola (allegato). Lo sviluppo dello studio tiene in considerazione numerosi e attendibili fonti di dati riportando che anche nello scenario più pessimistico (Caso "pre-COVID-19" con *smart working*: Tutte le classi in presenza, senza doppi turni, possibile scaglionamento degli ingressi, frequenza di corsi universitari in presenza al 100%) si possa rilevare una riduzione attesa di circa il 30% della domanda di trasporto pubblico nelle ore di punta, rispetto alla domanda iniziale.

Relativamente al quesito del Ministero delle Infrastrutture e dei Trasporti inerente alla considerazione della possibile analogia tra conviventi/congiunti e gruppi di lavoratori che condividono il medesimo luogo di lavoro – al fine di evitare il rispetto del distanziamento fisico prescritto – il CTS ribadisce che quanto approvato nella seduta n. 100 del 10/08/2020 è relativo esclusivamente nel caso in cui si tratti di persone che vivono nella stessa unità abitativa, nonché congiunti, persone che intrattengono rapporti interpersonali stabili (es.: coniuge, parenti e affini in linea retta e collaterale non conviventi, ma con stabile frequentazione; persone, non legate da vincolo di parentela, di affinità o di coniugio, che condividono abitualmente gli stessi luoghi e/o svolgono vita sociale in comune). Più specificamente, il CTS, sempre nella seduta n. 100 del 10/08/2020, ha sottolineato l'importanza della corretta interpretazione dei concetti di "persone conviventi" o di "congiunti assimilabili", osservando che, ad esempio, sono da considerare "congiunti assimilabili" una coppia stabile di fidanzati che, pur non condividendo la stessa abitazione, ha una stabile frequentazione. Viceversa, nel caso di colleghi di lavoro che frequentano abitualmente lo stesso luogo, le regole del distanziamento e della protezione

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individuale che sono previste nell'ambiente di lavoro devono essere rispettate anche in occasione di viaggi di lavoro che prevedano l'utilizzo del mezzo di trasporto pubblico.

## IMPIEGO DI MASCHERINE TRASPARENTI

A seguito della richiesta di parere giunta dalla Struttura del Commissario straordinario per l'attuazione e il coordinamento delle misure di contenimento e contrasto dell'emergenza epidemiologica COVID-19 relativamente all'impiego di dispositivi di protezione delle vie aeree trasparenti (allegato), il CTS ritiene di condividerne la fondamentale utilità, soprattutto per incrementare la capacità di comunicazione, favorendo il rapporto umano tra persone, ad esempio, tra persone sorde, tra bambini e adulti, tra *caregiver* e anziani, ecc.

Se questa tipologia di dispositivi è destinata all'utilizzo da parte dei lavoratori, il CTS rileva che è necessaria una idonea certificazione, attraverso i percorsi esistenti presso gli enti tecnici accreditati (UNI, Accredia, ecc.). Viceversa, in caso di utilizzo comunitario, la produzione e vendita di tali dispositivi può essere consentita ai sensi dell'art. 16 co. 2 del D.L. 18/03/2020.

## ORDINANZA DELLA REGIONE LAZIO SULLA OBBLIGATORIETÀ DELLA VACCINAZIONE ANTINFLUENZALE – RICORSO PROPOSTO INNANZI AL TAR DEL LAZIO

A seguito del pronunciamento del TAR del Lazio in diversi procedimenti relativi all'impugnazione dell'Ordinanza del Presidente della Regione Lazio del 17/04/2020 n. 200030, avente ad oggetto l'obbligo di vaccinazione antinfluenzale per i soggetti di età superiore ai 65 anni, per i medici e per il personale sanitario e socio-sanitario, è

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stata richiesta al CTS una specifica relazione relativa alla “valutazione sulla rischioosità della vaccinazione alla luce della miglior scienza”.

La Direzione Generale della Prevenzione Sanitaria del Ministero della Salute ha elaborato la relazione richiesta (allegato) che sarà trasmessa al Servizio contenzioso del Dipartimento della Protezione Civile per i seguiti di competenza.

## PARERI

- In relazione alla richiesta di parere per [REDACTED] (allegato), la Direzione Generale dei Dispositivi Medici e del Servizio Farmaceutico ha richiesto chiarimenti all'azienda titolare del prodotto (allegato).

Il CTS conclude la seduta alle ore 18,45.

	<del>PRESENTE</del>	ASSENTE
Dr Agostino MIOZZO	[REDACTED]	
Dr Fabio CICILIANO	[REDACTED]	
Dr Massimo ANTONELLI		
Dr Giovannella BAGGIO	IN VIDEOCONFERENZA	
Dr Roberto BERNABEI		
Dr Silvio BRUSAFERRO	IN VIDEOCONFERENZA	
Dr Elisabetta DEJANA	IN VIDEOCONFERENZA	
Dr Mauro DIONISIO	IN VIDEOCONFERENZA	
Dr Ranieri GUERRA	IN VIDEOCONFERENZA	
Dr Achille IACHINO	IN VIDEOCONFERENZA	
Dr Sergio IAVICOLI		
Dr Giuseppe IPPOLITO		
Dr Franco LOCATELLI		X

~~INFORMAZIONI NON CLASSIFICATE CONTROLLATE~~



# Presidenza del Consiglio dei Ministri

DIPARTIMENTO DELLA PROTEZIONE CIVILE

COMITATO TECNICO SCIENTIFICO EX OO.C.D.P.C. 03/02/2020, N. 630; 18/04/2020, N. 663; 15/05/2020, N. 673

Dr Nicola MAGRINI		PRESENTE Ammassari in rappresentanza di AIFA
Dr Francesco MARAGLINO	IN VIDEOCONFERENZA	
Dr Rosa Marina MELILLO	IN VIDEOCONFERENZA	
Dr Nausicaa ORLANDI	IN VIDEOCONFERENZA	
Dr Flavia PETRINI	IN VIDEOCONFERENZA	
Dr Kyriakoula PETROPULACOS	IN VIDEOCONFERENZA	
Dr Giovanni REZZA		
Dr Luca RICHELDI		
Dr Giuseppe RUOCCO		
Dr Nicola SEBASTIANI		
Dr Andrea URBANI	IN VIDEOCONFERENZA	
Dr Alberto VILLANI	IN VIDEOCONFERENZA	
Dr Alberto ZOLI	IN VIDEOCONFERENZA	

~~INFORMAZIONI NON CLASSIFICATE CONTROLLATE~~

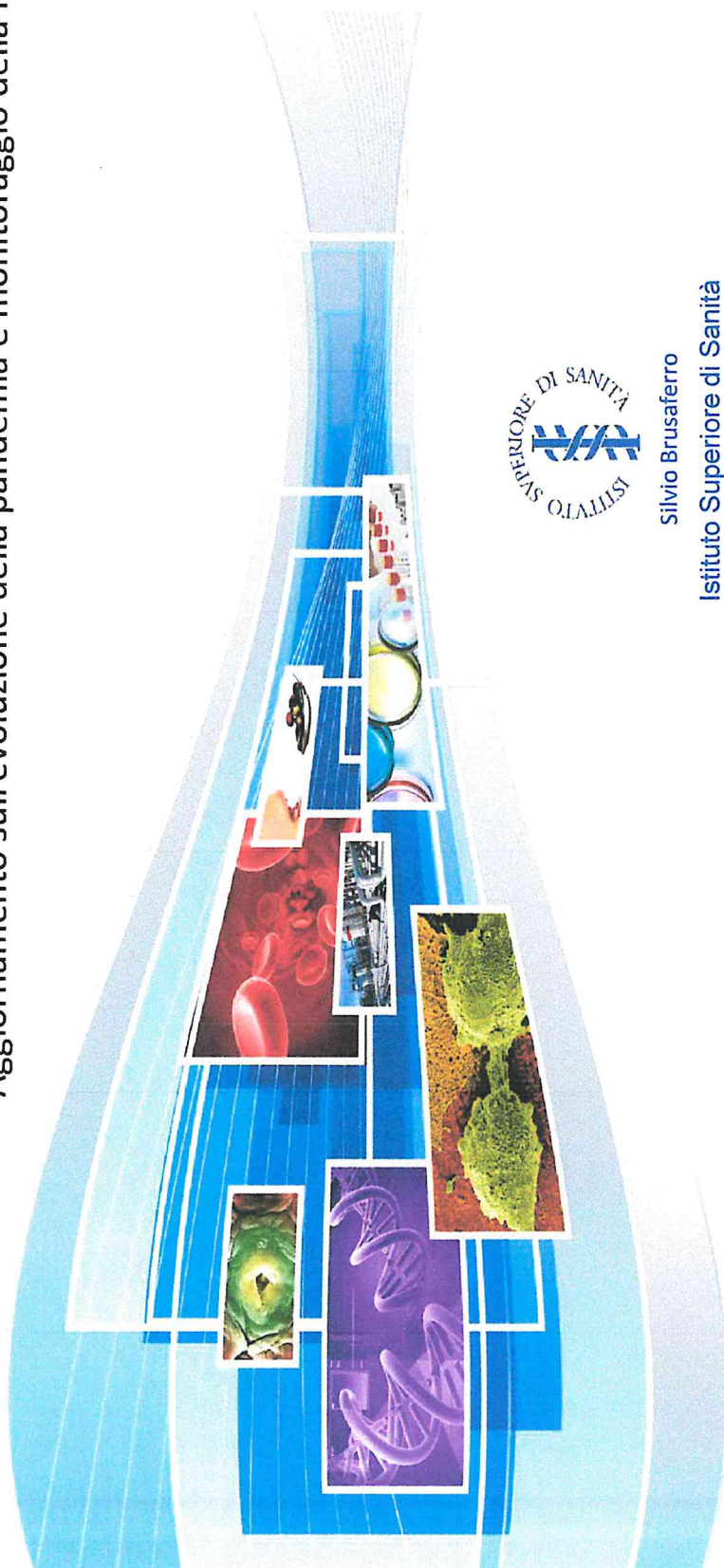
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Aggiornamento NUOVO CORONAVIRUS COVID-19, 20 agosto 2020

## Allegato 1

# COVID-19

## Aggiornamento sull'evoluzione della pandemia e monitoraggio della fase di transizione



Silvio Brusaferro  
Istituto Superiore di Sanità

# COVID-19 – in Italia

## Situazione dall'inizio della epidemia

Data di ultimo aggiornamento: 19 agosto 2020

**254.818**  
Casi

**30.433**  
Casi tra gli operatori sanitari\*

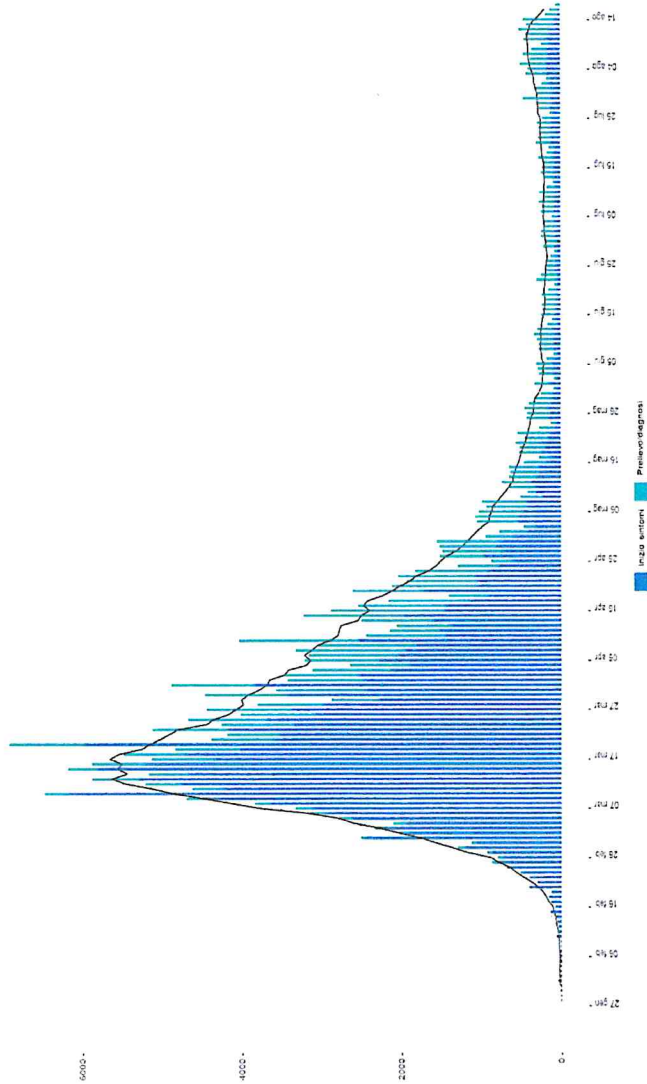
**60 anni**  
Età mediana dei casi

**46,4% | 53,6%**  
Maschi (tg) | Femmine (tg)

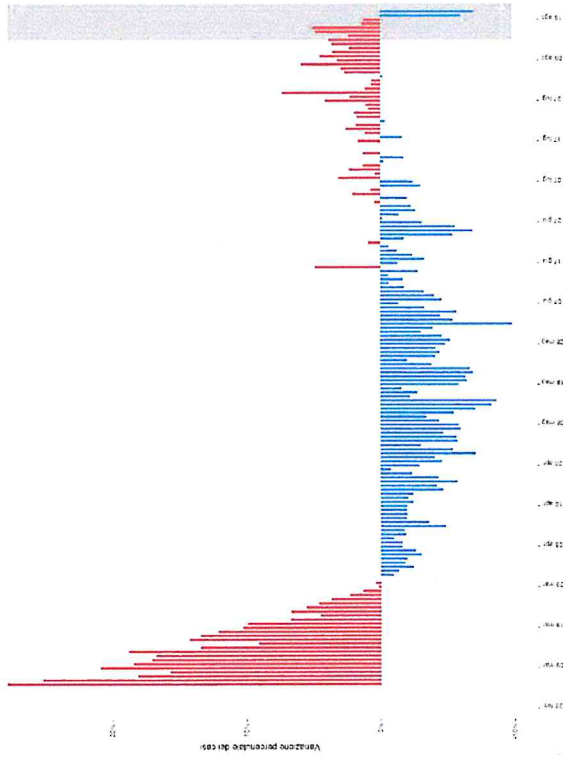
**35.851 (14,1%)**  
Deceduti (letalità)

**191.681**  
Rigenerati

DIPARTIMENTO PROTEZIONE CIVILE  
Allegato n° 1 Protocollo Uscita  
CTS 630-2020/0046759 31/08/2020



Numero di casi di infezione confermata da virus SARS-CoV-2 in Italia segnalati al sistema di sorveglianza integrato per data di inizio sintomi (blu) e per data di prelievo/diagnosi (verde), 23 gennaio – 18 agosto 2020



Variazione percentuale nel numero di nuovi casi di infezione confermata da virus SARS-CoV-2 per data di diagnosi (media mobile settimanale), Italia, 28 febbraio – 6 agosto 2020



# COVID-19 – in Italia

## Aumento dei casi per Regione/PA

Differenza incidenza 14 giorni tra:  
3 agosto-16 agosto e 20 luglio-2 agosto



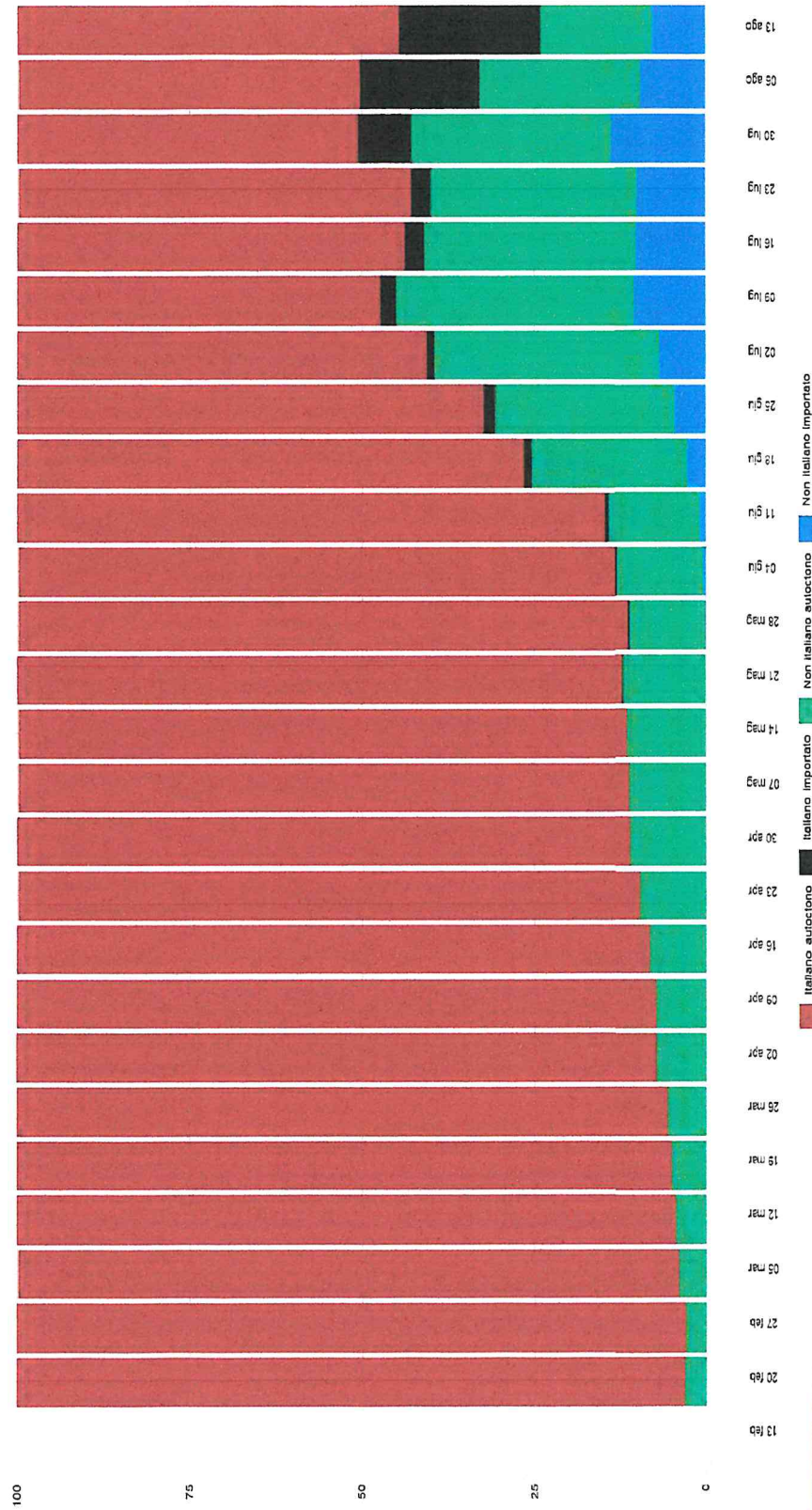
Differenza casi totali 14 giorni tra:  
3 agosto-16 agosto e 20 luglio-2 agosto



Data di ultimo aggiornamento: 18 agosto 2020

# COVID-19 – in Italia

% casi importati/autoctoni per nazionalità italiana/non-italiana

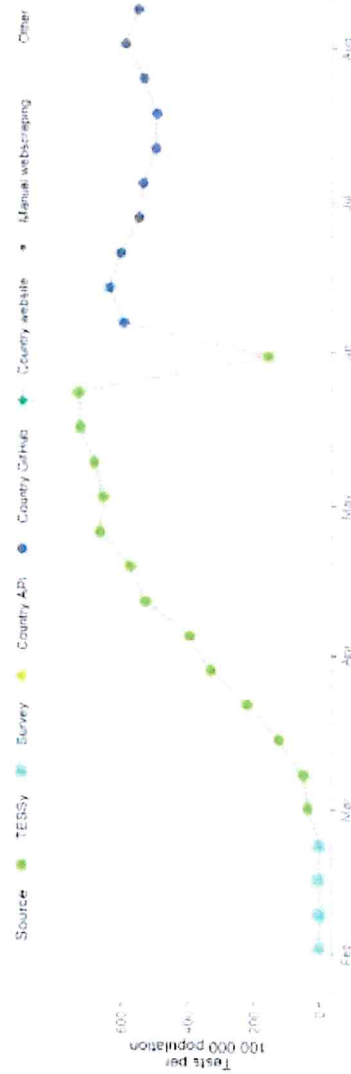


# COVID-19 – in Italia

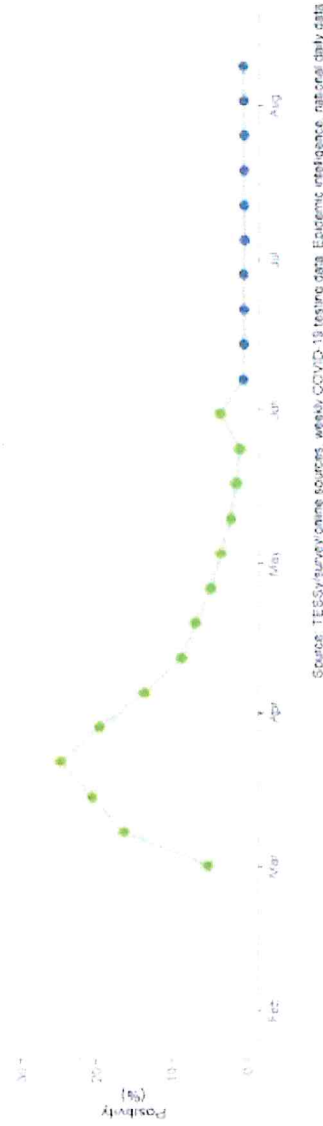
Test-Track-Trace

Tamponi/100 000 pop e %positività per settimana (fonte ECDC)

Italy: weekly testing rate



Italy: weekly test positivity



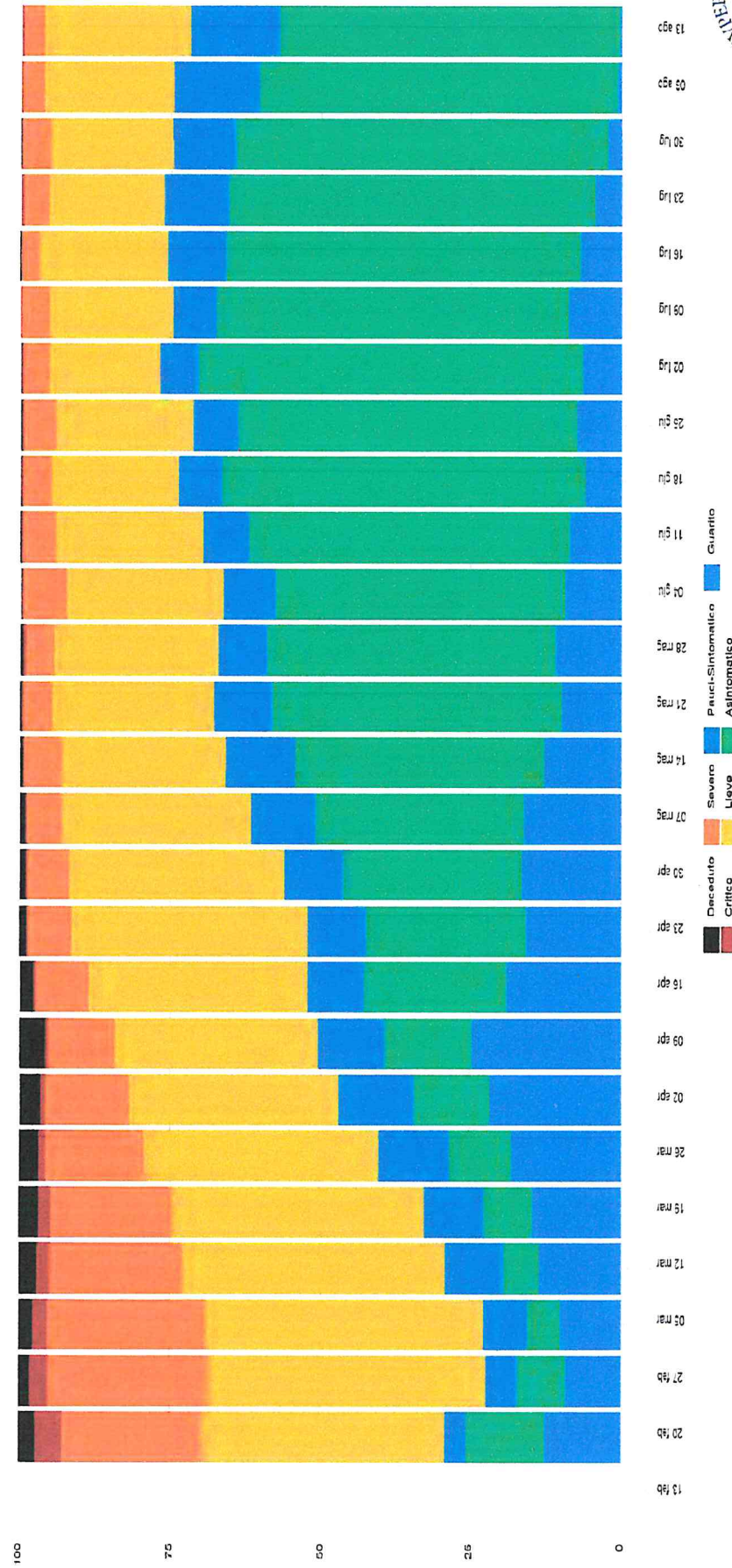
# COVID-19 – in Italia

## Transizione epidemiologica

# Situazione dall'inizio della epidemia

### Percentuale di Casi confermati di COVID-19 per stato clinico alla momento della diagnosi e settimana di diagnosi

**DIPARTIMENTO PROTEZIONE CIVILE**  
Allegato n° 1 Protocollo Uscita  
**CTS 630-2020/0046759 31**



Data di ultimo aggiornamento: 18 agosto 2020



# COVID-19 – in Italia

Transizione epidemiologica

Età mediana dei casi diagnosticati e riportati al sistema di sorveglianza integrato

DIPARTIMENTO PROTEZIONE CIVILE  
Allegato n° 1 Protocollo Uscita  
CTS 630-2020/0046759 31/08/2020



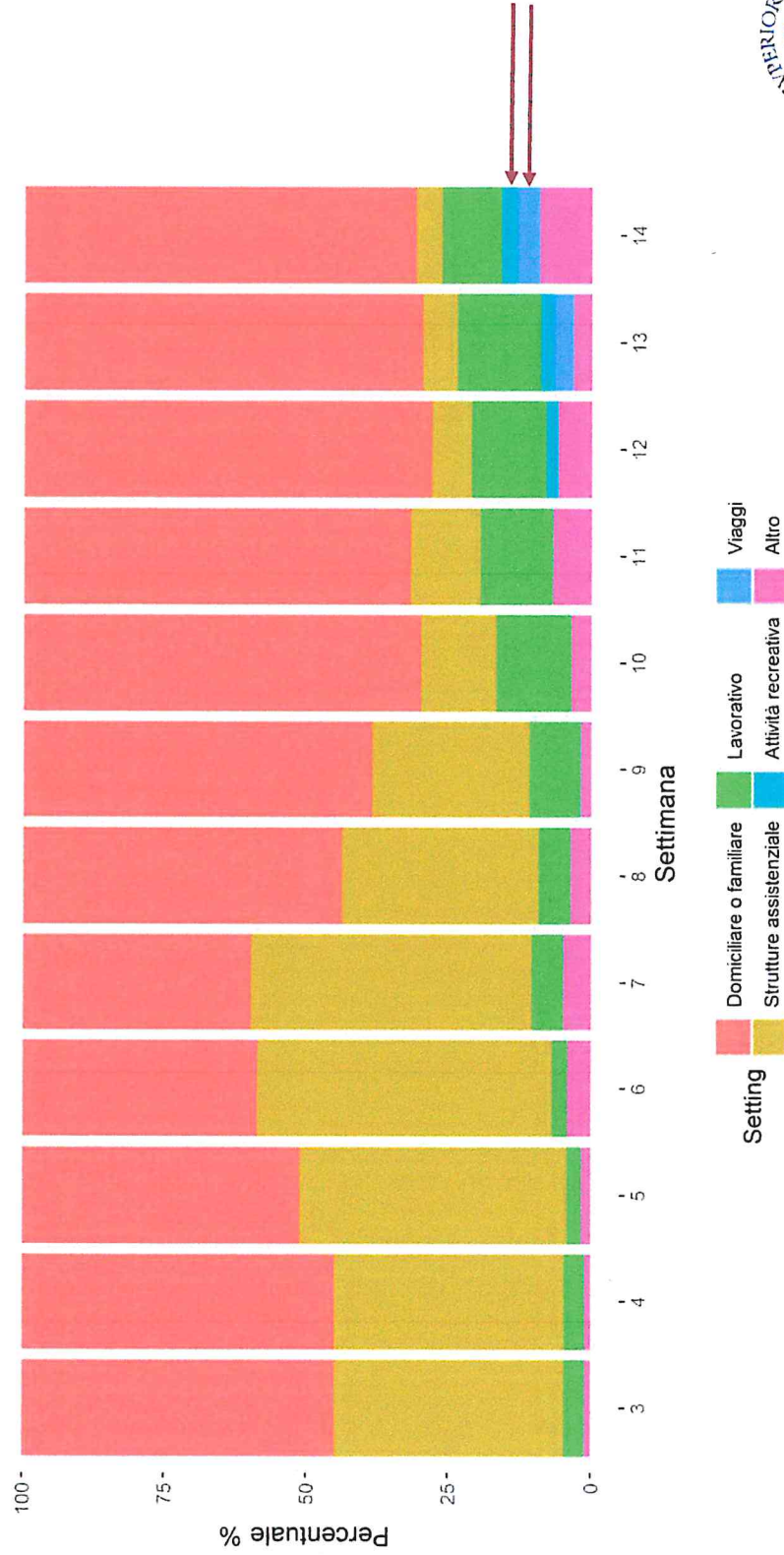
Data di ultimo aggiornamento: 18 agosto 2020

# COVID-19 – in Italia

Transizione epidemiologica

Distribuzione dei focolai attivi in Italia per setting e settimana di monitoraggio (settimana 14=10-16 agosto 2020)

DIPARTIMENTO PROTEZIONE CIVILE  
Allegato n° 1 Protocollo Uscita  
CTS 630-2020/0046759 31/08/2020

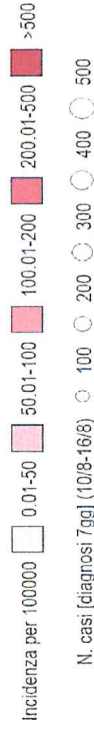
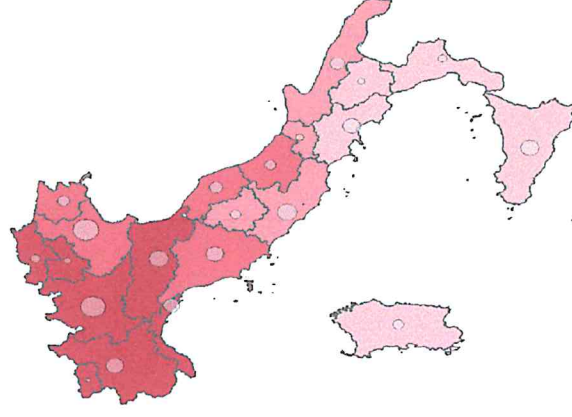


Data di ultimo aggiornamento: 18 agosto 2020



# COVID-19 – in Italia

Persistenza di trasmissione



Incidenza (per 100.000 abitanti) dei casi  
confermati di COVID-19 e numero di casi  
diagnosticati nella settimana 10 – 16 agosto 2020,  
per Regione/PA di diagnosi



Data di ultimo aggiornamento: 18 agosto 2020

Incidenza cumulativa per COVID-19 (per 100,000 ab) per Regione/PA, a 7 e 14gg, dati al 11 agosto 2020 relativi alla settimana 10/8-16/8 e 3/8-16/8

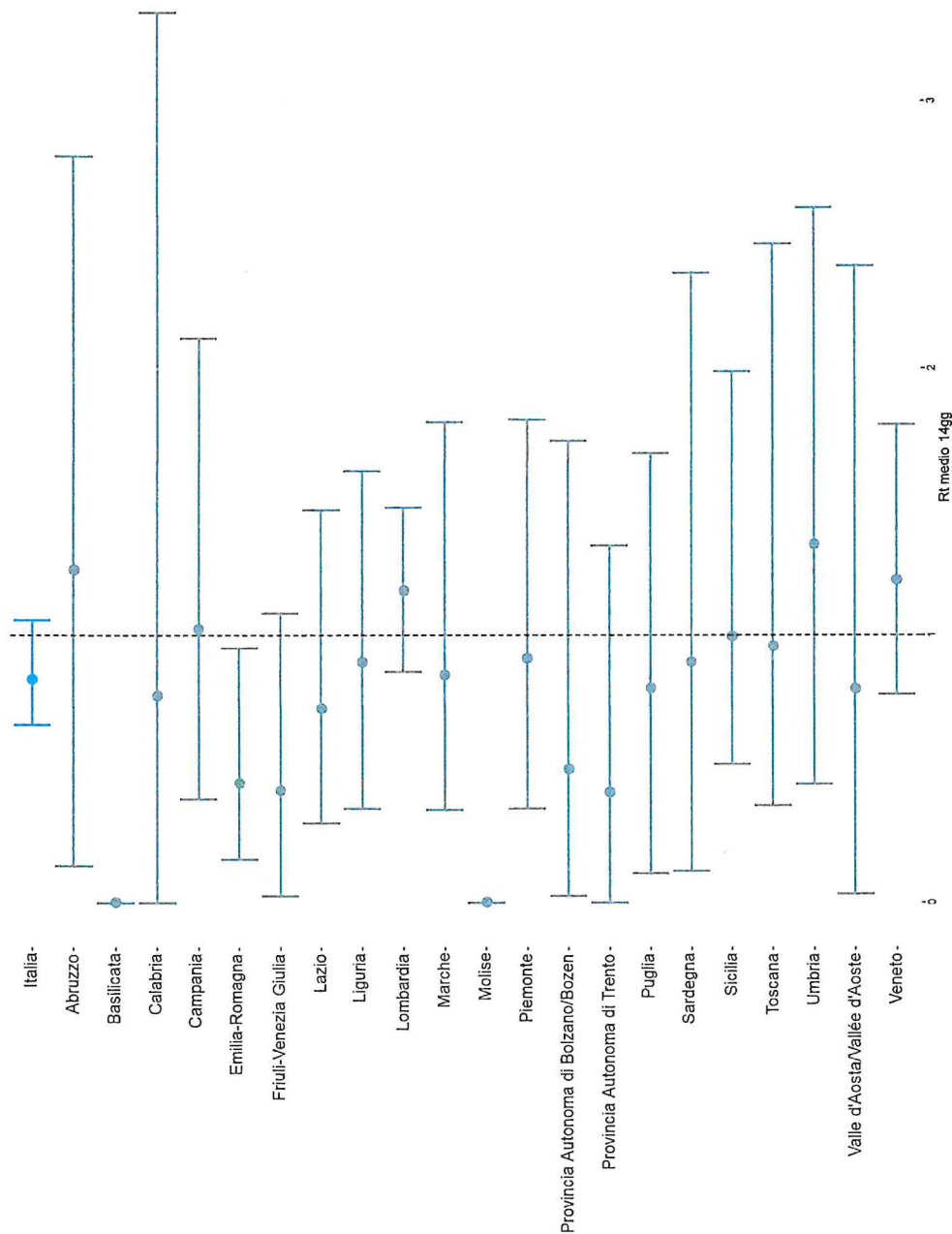
Regione/PA	Numero di casi totale	Incidenza cumulativa per 100.000 ab	Diagnosi ultimi 7 gg	Incidenza 7 gg per 100.000 ab	Diagnosi ultimi 14gg	Incidenza 14gg
Abruzzo	3562	272.79	52	3.98	141	10.80
Basilicata	454	81.52	7	1.26	30	5.39
Calabria	1283	66.66	21	1.09	43	2.23
Campania	5312	91.81	201	3.47	277	4.93
Emilia-Romagna	30 477	682.25	291	6.51	616	11.29
Friuli-Venezia Giulia	3545	292.65	59	4.87	99	8.27
Lazio	9228	157.33	286	4.88	459	7.34
Liguria	10 510	681.08	156	10.11	214	11.27
Lombardia	97 454	964.51	501	4.96	1069	10.38
Marche	7046	464.04	90	5.93	150	9.88
Molise	489	161.78	17	5.62	18	5.56
Piemonte	32 270	743.31	208	4.79	393	9.55
Provincia Autonoma di Bolzano/Bozen	2801	526.42	30	5.64	68	12.78
Provincia Autonoma di Trento	5001	921.44	8	1.47	23	4.24
Puglia	4880	121.75	118	2.94	215	5.36
Sardegna	1499	91.94	53	3.25	82	5.03
Sicilia	3804	76.56	232	4.67	464	9.34
Toscana	10 633	285.62	196	5.26	350	9.40
Umbria	1547	175.74	36	4.09	72	8.18
Valle d'Aosta/Vallée d'Aoste	1214	967.32	1	0.80	9	7.17
Veneto	21 274	433.48	538	10.96	1021	20.80
ITALIA	254 283	422.08	3101	5.15	5813	9.65

DIPARTIMENTO PROTEZIONE CIVILE  
Allegato n° 1 al Protocollo d'Intesa  
C-17-2020-0006759-337087020





## Rt «medio 14 gg» (DAL 30/7 AL 12/8, CALCOLATO AL 18/8/2020)



Stima riepilogativa dell' $R_t^{\text{medio14gg}}$  per regione basata su inizio sintomi 30/7 AL 12/8, calcolato al 18/8/2020

# Indicatori di processo sulla completezza dei dati (tabella 1)

Regione/PA	Ind1.1 settimana precedente	Ind1.1 settimana di riferimento	Variazione	Ind1.2	Ind1.3	Ind1.4
Abruzzo	89.1	89.3	Stabilmente sopra-soglia	100.0	100	100.0
Basilicata	Assenza di casi sintomatici	100.0	Stabilmente sopra-soglia	ND	ND	100.0
Calabria	88.9	83.3	Stabilmente sopra-soglia	100.0	ND	100.0
Campania	84.6	64.2	Stabilmente sopra-soglia	100.0	100	98.7
Emilia-Romagna	100.0	100.0	Stabilmente sopra-soglia	96.7	100	99.8
FVG	100.0	100.0	Stabilmente sopra-soglia	100.0	100	100.0
Lazio	92.0	92.8	Stabilmente sopra-soglia	100.0	100	98.9
Liguria	79.5	62.0	Stabilmente sopra-soglia	100.0	100	95.2
Lombardia	81.3	79.0	Stabilmente sopra-soglia	99.7	ND	95.0
Marche	100.0	100.0	Stabilmente sopra-soglia	100.0	ND	100.0
Molise	100.0	80.0	Stabilmente sopra-soglia	100.0	ND	100.0
Piemonte	69.6	68.9	Stabilmente sopra-soglia	100.0	100	91.6
PA Bolzano/Bozen	100.0	98.2	Stabilmente sopra-soglia	100.0	100	97.8
PA Trento	100.0	100.0	Stabilmente sopra-soglia	100.0	100	94.9
Puglia	95.9	97.1	Stabilmente sopra-soglia	100.0	100	100.0
Sardegna	96.2	97.9	Stabilmente sopra-soglia	100.0	ND	100.0
Sicilia	86.6	74.4	Stabilmente sopra-soglia	100.0	100	97.8
Toscana	94.0	93.1	Stabilmente sopra-soglia	97.6	100	99.8
Umbria	93.9	96.0	Stabilmente sopra-soglia	100.0	100	100.0
V.d'Aosta/V.d'Aoste	100.0	100.0	Stabilmente sopra-soglia	100.0	ND	100.0
Veneto	53.9	74.7	Aumentato - Sopra-soglia	98.5	100	97.9

DIPARTIMENTO PROTEZIONE CIVILE  
Allegato n° 1 Protocollo Uscita  
CTS 630-2020/0046759 31/08/2020



# Indicatori di risultato sulla trasmissione ed impatto sui servizi assistenziali (tabella 2)

Regione/PA	Almeno un caso segnalato negli ultimi 5 giorni	Indicatori di monitoraggio								Classificazione del rischio e note		
		Ind3.1	Ind3.2*	Ind3.4	Focolai attivi	Focolai attivi precedente	Focolai attivi trend	Ind3.5 nuovi focolai	Ind3.6	Ind3.8**	Ind3.9**	
Abruzzo	Si	-48.7	0.65 (CI: 0.33-1.08)	-41.6	18	11	↑	9	12	1%	2%	Bassa
Casi in diminuzione in entrambi i flussi di sorveglianza. Rt inferiore a 1, anche se lo supera nel suo intervallo di confidenza maggiore. Sono complessivamente segnalati 18 focolai attivi nella Regione, in aumento rispetto alla settimana precedente. Sono stati segnalati 12 i nuovi casi di focolai associati ad un focolaio noto (in aumento). Non si rilevano segnali di sovraccarico dei servizi assistenziali ospedalieri monitorati.												
Basilicata	Si	-60.9	0 (CI: 0-0)	-69.6	1	1	=	1	0	0%	0%	Bassa
Casi in diminuzione in entrambi i flussi di sorveglianza. Rt =0, minore di 1 anche nell'intervallo di confidenza maggiore. Il numero di focolai attivi con un nuovo focolaio riportato nella settimana di monitoraggio. Non risultano nuovi casi associati a catene di contagio note. Non si rilevano segnali di sovraccarico dei servizi assistenziali ospedalieri monitorati.												
Calabria	Si	258.8	1.83 (CI: 1.12-2.87)	-4.5	4	2	↑	2	29	0%	1%	Moderata
Casi in aumento nel flusso di sorveglianza coordinato dal Ministero della salute (da 17 a 61 casi) e in lieve diminuzione nel flusso di sorveglianza coordinato da ISS (21 nuovi casi in base al flusso ISS di cui 5 importati da stato estero). Rt maggiore di 1 anche nel suo intervallo di confidenza maggiore. Sono segnalati 4 focolai attivi (in aumento) di cui due nuovi nella Regione. Sono 29 i nuovi casi segnalati non associati a catene di contagio note (in aumento). Non si rilevano segnali di sovraccarico dei servizi assistenziali ospedalieri monitorati.												



## Indicatori di risultato sulla trasmissione ed impatto sui servizi assistenziali (tabella 2)

Regione/PA	Almeno un caso segnalato negli ultimi 5 giorni	Indicatori di monitoraggio										Classificazione del rischio e note
		Ind3.1	Ind3.2*	Ind3.4	Focolai attivi	Focolai precedenti	Focolai attivi trend	Ind3.5 nuovi focolai	Ind3.6	Ind3.8**	Ind3.9**	
Campania	Si	229.5	1.11 (Ci: 0.62-1.7)	164.5	6	3	↑	6	72	0%	1%	Casi in aumento in entrambi i flussi di sorveglianza (segnalati all'ISS 201 casi di cui 41 importati da stato estero). Si conferma il trend in aumento nel numero dei casi, anche escludendo i casi importati da stato estero. Rt superiore a 1 anche se lo non lo è stata. Sono segnalati 6 focolai attivi nella Regione (in aumento) tutti nuovi. Sono 72 i nuovi casi segnalati che non sono associati a catene di contagio note (in aumento). Non si rilevano segnali di sovraccarico dei servizi assistenziali ospedalieri monitorati. Casi in diminuzione in entrambi i flussi. Sono stati segnalati al flusso coordinato 111-155 nella settimana di riferimento 291 casi, di cui 101 importati da stato estero. Rt inferiore a 1, anche nel suo intervallo di confidenza minore. Il numero di focolai attivi è elevato ed in aumento nella settimana di monitoraggio con 44 nuovi focolai e 101 nuovi casi non associati a catene di contagio note (in lieve diminuzione). Non si rilevano segnali di sovraccarico dei servizi assistenziali ospedalieri monitorati.
Emilia-Romagna	Si	-9.2	0.53 (Ci: 0.38-0.69)	-10.5	162	147	↑	44	101	1%	2%	Casi in aumento in entrambi i flussi di sorveglianza. Sono segnalati 59 casi al flusso coordinato da ISS di cui 22 importati da stato estero. Il trend nel numero di nuovi casi si conferma in aumento anche escludendo i casi importati da stato estero. Rt minore di 1, anche nel suo intervallo di confidenza maggiore. Sono segnalati 16 focolai attivi (in lieve diminuzione), di cui 5 nuovi nella settimana di monitoraggio corrente. Sono 14 i nuovi casi di infezione non associati a catene di contagio note (in aumento). Non si rilevano segnali di sovraccarico dei servizi assistenziali ospedalieri monitorati.
FVG	Si	52.6	0.51 (Ci: 0.23-0.91)	47.5	16	17	↓	5	14	2%	0%	Casi in aumento in entrambi i flussi di sorveglianza. Sono segnalati 16 focolai attivi (in lieve diminuzione), di cui 5 nuovi nella settimana di monitoraggio corrente. Sono 14 i nuovi casi di infezione non associati a catene di contagio note (in aumento). Non si rilevano segnali di sovraccarico dei servizi assistenziali ospedalieri monitorati.

# Indicatori di risultato sulla trasmissione ed impatto sui servizi assistenziali (tabella 2)

Regione/PA		Almeno un caso segnalato negli ultimi 5 giorni	Indicatori di monitoraggio								Classificazione del rischio e note			
			Ind3.1	Ind3.2*	Ind3.4	Focolai attivi	Focolai attivi prec.	Focolai attivi trend	Ind3.5 nuovi focolai	Ind3.6			Ind3.8**	Ind3.9**
Lazio		Si	117.9	0.68 (CI: 0.47-0.96)	65.3	21	18	↑	7	6	1%	5%	Moderata	Casi in aumento in entrambi i flussi di sorveglianza. Sono segnalati 286 casi (flusso ISS) di cui 107 importati da stato estero. Il trend nel numero di nuovi casi conferma in aumento anche escludendo i casi importati da stato estero. Rt inferiore a 1, anche nel suo intervallo di confidenza maggiore. Il numero di focolai attivi nella Regione è in aumento, sono 7 i nuovi focolai segnalati nella settimana corrente (in aumento sono riportati 6 nuovi casi non associati a catene di contagio note (invarianti). Non si rilevano segnali di sovraccarico dei servizi assistenziali ospedalieri monitorati.
Liguria		Si	272.3	0.84 (CI: 0.51-1.26)	169.0	12	9	↑	3	8	1%	1%	Moderata	Casi in aumento in entrambi i flussi di sorveglianza. Sono segnalati 156 casi (flusso ISS) di cui 22 importati da stato estero. Il trend nel numero di nuovi casi si conferma in aumento anche escludendo i casi importati da stato estero. Rt minore di 1, sebbene lo superi nell'intervallo di confidenza maggiore. Numero di focolai attivi in aumento. Sono 3 i nuovi focolai segnalati nella settimana di monitoraggio e 8 nuovi casi non associati a catene di contagio note (in lieve aumento). Non si rilevano segnali di sovraccarico dei servizi assistenziali ospedalieri monitorati.
Lombardia		Si	-2.6	1.28 (CI: 1.11-1.45)	-11.8	492	464	↑	42	297	1%	2%	Moderata	Casi in diminuzione in entrambi i flussi di sorveglianza. Rt maggiore di 1, anche nell'intervallo di confidenza minore. Sono riportati 501 nuovi casi nella settimana di monitoraggio di cui il 26 (5%) importati da stato estero. Sono 492 i focolai attivi nella Regione (in aumento) di cui 42 nuovi. La maggior parte dei nuovi casi diagnosticati, 297, non sono associati a catene di contagio note. Non si rilevano segnali di sovraccarico dei servizi assistenziali ospedalieri monitorati.
Marche		Si	42.1	0.84 (CI: 0.47-1.37)	50.0	7	3	↑	6	40	0%	1%	Moderata	Casi in aumento in entrambi i flussi di sorveglianza. Sono segnalati 90 casi al flusso coordinato da ISS di cui 50 (56%) importati da stato estero. Il trend nel numero di nuovi casi si conferma in lieve aumento anche escludendo i casi importati. Rt minore di 1, sebbene lo superi nel suo intervallo di confidenza maggiore. Questa settimana sono segnalati 7 nuovi focolai attivi (in aumento) di cui 6 nuovi. I nuovi casi che non risultano associati a catene di contagio note sono in lieve diminuzione. Non si rilevano segnali di sovraccarico dei servizi assistenziali ospedalieri monitorati.



# Indicatori di risultato sulla trasmissione ed impatto sui servizi assistenziali (tabella 2)

Regione/PA	Almeno un caso segnalato negli ultimi 5 giorni	Indicatori di monitoraggio										Classificazione del rischio e note
		Ind3.1	Ind3.2*	Ind3.4	Focolai attivi	Focolai attivi prec.	Focolai attivi trend	Ind3.5 nuovi focolai	Ind3.6	Ind3.8**	Ind3.9**	
Molise	Si	100.0	0 (CI: 0-0)	1600.0	2	0	↑	2	0	0%	0%	Casi in aumento in entrambi i flussi di sorveglianza, con numerosità limitata. Sono stati segnalati 17 casi di flusso coordinato da ISS nella settimana di monitoraggio di cui 8 (47%) importati da stato estero. Il trend del numero di nuovi casi si conferma in aumento, anche escludendo i casi importati. Rt =0, minore di 1, nell'intervallo di confidenza maggiore. Sono presenti focolai attivi nella Regione che in precedenza non riportava focolai. Non sono segnalati casi non associati a catene di contagio note. Non si rilevano segnali di sovraccarico dei servizi assistenziali ospedalieri monitorati.
Piemonte	Si	27.1	0.73 (CI: 0.46-1.03)	12.4	29	23	↑	14	12	1%	2%	Casi in aumento in entrambi i flussi di sorveglianza, con la terza settimana consecutiva. Sono stati segnalati 302 casi al flusso coordinato da ISS nella settimana di monitoraggio di cui 80 (39%) importati da stato estero. Escludendo i casi importati da stato estero, i casi risultano in diminuzione (-15%). Rt minore di 1, neppure lo raggiunge nell'intervallo di confidenza maggiore. Sono riportati 29 focolai attivi nella settimana (in aumento) di cui 14 nuovi focolai. Sono segnalati 12 nuovi casi non associati a catene di contagio note (in diminuzione). Non si rilevano segnali di sovraccarico dei servizi assistenziali ospedalieri monitorati.
PA Bolzano/Bozen	Si	-35.6	0.38 (CI: 0.13-0.72)	-21.1	6	11	↓	1	8	1%	1%	Casi in diminuzione in entrambi i flussi di sorveglianza. Sono segnalati 30 casi (flusso ISS) di cui 14 casi importati da stato estero. Rt minore di 1, anche nell'intervallo di confidenza maggiore. Sono segnalati 6 focolai attivi nella Provincia Autonoma (in diminuzione) con 1 nuovo focolaio di trasmissione. Sono 8 i nuovi casi non sono associati a catene di contagio note (in lieve aumento). Non si rilevano segnali di sovraccarico dei servizi assistenziali ospedalieri monitorati.
PA Trento	Si	-50.0	0.28 (CI: 0.06-0.6)	-46.7	7	7	=	0	8	1%	0%	Casi in diminuzione in entrambi i flussi di sorveglianza. Sono segnalati 8 casi (flusso ISS) di cui 4 casi importati da stato estero. Rt minore di 1, anche nell'intervallo di confidenza maggiore. Sono riportati 7 focolai attivi (stabili), nessuno nuovo. Sono 8 i nuovi casi non associati a catene di contagio note. Non si rilevano segnali di sovraccarico dei servizi assistenziali ospedalieri monitorati.



# Indicatori di risultato sulla trasmissione ed impatto sui servizi assistenziali (tabella 2)

Regione/PA	Almeno un caso segnalato negli ultimi 5 giorni	Indicatori di monitoraggio							Classificazione del rischio e note				
		Ind3.1	Ind3.2*	Ind3.4	Focolai attivi	Focolai attivi prec.	Focolai attivi trend	Ind3.5 nuovi focolai	Ind3.6	Ind3.8**	Ind3.9**		
Puglia	SI	92.0	0.71 (CI: 0.43-1.03)	21.6	11	11	=	10	27	0%	2%	Bassa	Casi in aumento in entrambi i flussi di sorveglianza per la terza settimana consecutiva. Sono segnalati 118 casi (flusso ISS) di cui 54 (46%) casi importati da stato estero. Escludendo i casi importati da stato estero i casi risultano in lieve diminuzione (-39%) inferiore a 1, anche se lo supera nell'intervallo di confidenza maggiore. Sono segnalati 11 focolai attivi (stabili) si cui 10 nuovi nella Regione nella settimana di monitoraggio in corso. Sono 27 i casi non associati a catene di contagio note (in lieve aumento). Non si rilevano segnali di sovraccarico dei servizi assistenziali ospedalieri monitorati.
Sardegna	SI	116.0	0.84 (CI: 0.44-1.36)	82.8	8	5	↑	3	4	0%	1%	Moderata	Casi in aumento in entrambi i flussi di sorveglianza. Sono segnalati 53 casi (flusso ISS) di cui 17 (32%) casi importati da stato estero. Il trend nel numero di nuovi casi si conferma in aumento anche escludendo i casi importati. Rt minore di 1, anche se lo supera nell'intervallo di confidenza maggiore. Sono riportati 8 focolai di trasmissione attivi nella Regione (in aumento) di cui 3 nuovi. Sono 4 i casi non associati a catene di contagio note (in lieve aumento). Non si rilevano segnali di sovraccarico dei servizi assistenziali ospedalieri monitorati.
Sicilia	SI	111.5	0.83 (CI: 0.56-1.16)	0.0	61	35	↑	31	44	1%	1%	Moderata	Casi in aumento nel flusso di sorveglianza coordinato dal Ministero della Salute e stabili nel flusso coordinato da ISS. Sono segnalati 232 casi (flusso ISS) di cui 87 (38%) casi importati da stato estero. Escludendo i casi importati da stato estero i casi risultano in aumento (+67%). Rt minore di 1, anche se non lo supera nell'intervallo di confidenza minore. Sono segnalati 61 focolai attivi nella Regione (in aumento), 31 di questi sono nuovi. Dei nuovi casi segnalati, 44 non sono associati a catene di contagio note (in aumento). Non si rilevano segnali di sovraccarico dei servizi assistenziali ospedalieri monitorati.

# Indicatori di risultato sulla trasmissione ed impatto sui servizi assistenziali (tabella 2)

Regione/PA	Almeno un caso segnalato negli ultimi 5 giorni	Indicatori di monitoraggio							Classificazione del rischio e note		
		Ind3.1	Ind3.2*	Ind3.4	Focolai attivi	Focolai attivi precedenti	Focolai attivi trend	Ind3.5 nuovi focolai	Ind3.6	Ind3.8**	Ind3.9**
Toscana	Si	29.5	0.72 (CI: 0.49-1.02)	27.3	33	20	↑	17	129	1%	0%
Casi complessivamente in aumento in entrambi i flussi di sorveglianza per la terza settimana consecutiva. Sono stati segnalati 196 nuovi casi (flusso ISS) di cui 84 (41%) importati da stato estero. Il trend nel numero di nuovi casi si conferma in aumento anche escludendo i casi importati. Rt minore di 1, sebbene lo raggiunga nel suo intervallo di confidenza maggiore. Sono segnalati 33 focolai attivi nella Regione (in aumento), di cui 17 nuovi nella settimana di monitoraggio in corso. La maggior parte dei nuovi casi segnalati non è associata a catene di contagio notificate. Si rilevano segnali di sovraccarico dei servizi assistenziali ospedalieri monitorati.											
Umbria	Si	38.7	1.36 (CI: 0.72-2.17)	0.0	12	7	↑	6	11	0%	1%
Casi in aumento nel flusso di sorveglianza coordinata. Ministero della Salute e stabili nel flusso coordinato da ISS. Sono stati segnalati 36 casi (flusso ISS) di cui 7 importati da stato estero. Rt maggiore di 1, anche se non lo supera nell'intervallo di confidenza minore. Vengono riportati 12 focolai di trasmissione attivi (in aumento) nella Regione, di cui 6 nuovi. Sono riportati 6 nuovi casi non associati a catene di contagio note. Non si rilevano segnali di sovraccarico dei servizi assistenziali ospedalieri monitorati.											
V.d'Aosta/V.d'Aoste	No	-85.7	1.18 (CI: 0.55-2.11)	-87.5	0	1	↓	0	2	0%	3%
Non sono stati notificati casi nei 5 giorni precedenti alla valutazione. Casi diagnosticati nella settimana di monitoraggio in diminuzione in entrambi i flussi di sorveglianza. Sono stati segnalati 8 casi di cui nessuno importato. Rt maggiore di 1, anche se non lo supera nell'intervallo di confidenza maggiore. Tale valore è riferito al 9 agosto 2020. Non vi sono focolai attivi nella Regione. Sono 2 i casi non associati a catene di contagio note (in diminuzione). Non si rilevano segnali di sovraccarico dei servizi assistenziali ospedalieri monitorati.											
Veneto	Si	24.5	1.08 (CI: 0.87-1.32)	11.4	169	130	↑	72	0	1%	1%
Casi in aumento in entrambi i flussi di sorveglianza per la terza settimana consecutiva. Sono stati segnalati 538 nuovi casi (flusso ISS) di cui 122 importati da stato estero. Rt maggiore di 1, anche se non lo supera nell'intervallo di confidenza minore. Sono segnalati 169 focolai attivi (in aumento) di cui 72 nuovi focolai nella settimana di monitoraggio in corso. Non sono segnalati casi non associati a catene di contagio note. Non si rilevano segnali di sovraccarico dei servizi assistenziali ospedalieri monitorati.											



# Indicatori di processo sulla resilienza dei servizi territoriali (tabella 3)

Regione/PA	Ind2.1 (sett. rif.)	Ind2.1 (prec.)	Ind2.2	Ind2.3 (opz.)	Ind2.4	Ind2.5	Totale risorse umane	Ind2.6	Resilienza dei servizi sanitari territoriali
Abruzzo	2.4%	3.9%	3.5	4	0.3 per 10000 [luglio]	0.5 per 10000 [luglio]	<b>0.8 per 10000</b>	100% [luglio]	1 allerta segnalata
Basilicata	0.5%	0.1%	1.5	-1	1 per 10000 [luglio]	6.9 per 10000 [luglio]	7.9 per 10000	100% [luglio]	0 allerte segnalate
Calabria	0.9%	0.3%	1	1	0.5 per 10000 [luglio]	0.5 per 10000 [luglio]	1 per 10000	100% [luglio]	0 allerte segnalate
Campania	1.2%	0.8%	2	ND	0.4 per 10000 [luglio]	0.7 per 10000 [luglio]	1.1 per 10000	100% [luglio]	0 allerte segnalate
Emilia-Romagna	1.5%	1%	3	ND	0.4 per 10000 [agosto]	0.9 per 10000 [agosto]	1.4 per 10000	100% [agosto]	0 allerte segnalate
FVG	1.1%	1%	3	1	0.2 per 10000 [luglio]	0.4 per 10000 [luglio]	<b>0.6 per 10000</b>	96.6% [luglio]	1 allerta segnalata
Lazio	2.1%	1.2%	2	2	0.7 per 10000 [agosto]	1 per 10000 [agosto]	1.6 per 10000	100% [agosto]	0 allerte segnalate
Liguria	2%	0.6%	1	ND	0.5 per 10000 [giugno]	1.2 per 10000 [giugno]	1.6 per 10000	<b>90.8%</b> [giugno]	0 allerte segnalate. Ind 2.6 minore 95%
Lombardia	2.1%	2%	2	ND	0.4 per 10000 [luglio]	0.6 per 10000 [luglio]	1 per 10000	97.3% [luglio]	0 allerte segnalate
Marche	2%	1.2%	2	1	0.4 per 10000 [luglio]	1 per 10000 [luglio]	1.4 per 10000	100% [luglio]	0 allerte segnalate
Molise	1.1%	0.3%	1	1	0.5 per 10000 [luglio]	1.2 per 10000 [luglio]	1.6 per 10000	100% [luglio]	0 allerte segnalate
Piemonte	1.3%	1.2%	3	2	0.3 per 10000 [agosto]	1 per 10000 [agosto]	1.3 per 10000	99% [agosto]	0 allerte segnalate
PA Bolzano/Bozen	0.6%	1.2%	<b>5.5</b>	<b>4.5</b>	0.5 per 10000 [luglio]	1 per 10000 [luglio]	1.5 per 10000	100% [luglio]	1 allerta segnalata
PA Trento	0.3%	0.3%	4	ND	1.1 per 10000 [agosto]	1.6 per 10000 [totale 87 in agosto]	2.7 per 10000	100% [agosto]	0 allerte segnalate
Puglia	3.1%	2.4%	3	3	0.2 per 10000 [giugno]	0.5 per 10000 [totale 189 in giugno]	<b>0.7 per 10000</b>	<b>88.2%</b> [giugno]	1 allerta segnalata, ind 2.6 minore 95%
Sardegna	1.1%	0.5%	3	4	0.3 per 10000 [agosto]	1.2 per 10000 [totale 188 in agosto]	1.4 per 10000	100% [agosto]	0 allerte segnalate
Sicilia	2%	1.4%	3	ND	0.3 per 10000 [luglio]	0.9 per 10000 [totale 472 in luglio]	1.2 per 10000	100% [luglio]	0 allerte segnalate
Toscana	0.4%	1%	2	2	0.5 per 10000 [luglio]	0.9 per 10000 [totale 339 in luglio]	1.4 per 10000	100% [luglio]	0 allerte segnalate
Umbria	2.5%	2.1%	2	2.5	0.5 per 10000 [luglio]	1.4 per 10000 [totale 127 in luglio]	2 per 10000	100% [luglio]	0 allerte segnalate
V.d'Aosta/V.d'Aoste	1.4%	2.3%	3	1	1 per 10000 [agosto]	1.3 per 10000 [totale 16 in agosto]	2.3 per 10000	100% [agosto]	0 allerte segnalate
Veneto	1.9%	1.6%	3	2	1 per 10000 [ agosto]	1.8 per 10000 [agosto]	2.8 per 10000	100% [agosto]	0 allerte segnalate

DIPARTIMENTO PROTEZIONE CIVILE  
Allegato n° 1 Protocollo Uscita

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03/08/2020  
04/08/2020  
05/08/2020  
06/08/2020  
07/08/2020  
08/08/2020



## Quadro sintetico

Regione.PA	Incidenza 14 gg per 100.000 ab	Incidenza 7 gg per 100.000 ab	Nuovi casi diagnostici nella settimana	Nuovi casi importati da Stato estero (%)	Nuovi casi identificati per screening	Trend settimanale dei nuovi casi di COVID- 19 diagnosticati Fonte ISS	Trend settimanale del numero di focolai attivi COVID-19	Stima di Rt (9 agosto 2020)	Classificazione di rischio per aumento di trasmissione ed impatto di COVID-19 sui servizi assistenziali	Resilienza dei servizi sanitari territoriali
Abruzzo	10.80	3.98	52	26 (50,0)	14	↓	↑	0.65 (Ci: 0.33-1.08)	Bassa	1 allerta segnalata
Basilicata	5.39	1.26	7	5 (71,4)	5	↓	=	0 (Ci: 0-0)	Bassa	0 allerte segnalate
Calabria	2.23	1.09	21	5 (23,8)	7	↓	↑	<b>1.83 (Ci: 1.12-2.87)</b>	Moderata	0 allerte segnalate
Campania	4.79	3.47	201	41 (20,4)	74	↑	↑	<b>1.11 (Ci: 0.62-1.7)</b>	Moderata	0 allerte segnalate
Emilia-Romagna	13.79	6.51	291	101 (34,7)	78	↓	↑	0.53 (Ci: 0.38-0.69)	Bassa	0 allerte segnalate
FVG	8.17	4.87	59	22 (37,3)	17	↑	↓	0.51 (Ci: 0.23-0.91)	Moderata	1 allerta segnalata
Lazio	7.83	4.88	286	107 (37,4)	34	↑	↑	0.68 (Ci: 0.47-0.96)	Moderata	0 allerte segnalate
Liguria	13.87	10.11	156	22 (14,1)	6	↑	↑	0.84 (Ci: 0.51-1.26)	Moderata	0 allerte segnalate. Ind 2.6 minore 95%
Lombardia	10.58	4.96	501	26 (5,2)	140	↓	↑	<b>1.28 (Ci: 1.11-1.45)</b>	Moderata	0 allerte segnalate
Marche	9.88	5.93	90	50 (55,6)	52	↑	↑	0.84 (Ci: 0.47-1.37)	Moderata	0 allerte segnalate
Molise	5.96	5.62	17	8 (47,1)	6	↑	↑	0 (Ci: 0-0)	Moderata	0 allerte segnalate
Piemonte	9.05	4.79	208	80 (38,5)	79	↑	↑	0.73 (Ci: 0.46-1.03)	Bassa*	0 allerte segnalate
PA Bolzano/Bozen	12.78	5.64	30	14 (46,7)	17	↓	↓	0.38 (Ci: 0.13-0.72)	Bassa	1 allerta segnalata
PA Trento	4.24	1.47	8	4 (50,0)	4	↓	=	0.28 (Ci: 0.06-0.6)	Bassa	0 allerte segnalate
Puglia	5.36	2.94	118	54 (45,8)	39	↑	=	0.71 (Ci: 0.43-1.03)	Bassa*	1 allerta segnalata, ind 2.6 minore 95%
Sardegna	5.03	3.25	53	17 (32,1)	6	↑	↑	0.84 (Ci: 0.44-1.36)	Moderata	0 allerte segnalate
Sicilia	9.34	4.67	232	87 (37,5)	48	=	↑	0.83 (Ci: 0.56-1.16)	Moderata	0 allerte segnalate
Toscana	9.40	5.26	196	81 (41,3)	59	↑	↑	0.72 (Ci: 0.49-1.02)	Moderata	0 allerte segnalate
Umbria	8.18	4.09	36	7 (19,4)	5	=	↑	<b>1.36 (Ci: 0.72-2.17)</b>	Moderata	0 allerte segnalate
V.d'Aosta/V.d'Aoste	7.17	0.80	1	0 (0,0)	0	↓	↓	<b>1.18 (Ci: 0.55-2.11)</b>	Molto Bassa **	0 allerte segnalate
Veneto	20.80	10.96	538	122 (22,3)	196	↑	↑	<b>1.08 (Ci: 0.87-1.32)</b>	Moderata	0 allerte segnalate

\* la valutazione si basa, alla luce di tutti gli altri parametri in esame, anche sul fatto che il trend in aumento nel numero dei casi non è confermato escludendo i casi importati da stato estero.

\*\* la valutazione si basa sul fatto che sebbene elevato il valore Rt riferisce una trasmissibilità al 9 agosto e viene interpretato alla luce della diminuzione del numero di casi e focolai documentata nella settimana successiva.

NB: La settimana di monitoraggio in corso include un giorno festivo, questo potrebbe influenzare i dati. La valutazione viene effettuata in base ai dati attualmente disponibili.



# Conclusione /1

- In seguito alla riduzione nel numero di casi di infezione da SARS-CoV-2 grazie alle misure di *lock-down*, l'Italia si trova in una fase epidemiologica di **transizione con tendenza ad un progressivo peggioramento. Anche in questa settimana si rileva la trasmissione diffusa del virus su tutto il territorio nazionale che, quando si verificano condizioni favorevoli, provoca focolai anche di dimensioni rilevanti, spesso associati all'importazione di casi da Stati esteri e successiva trasmissione locale (anche al rientro dopo periodi di vacanza in paesi a più elevata circolazione virale).**
- **Il numero di nuovi casi di infezione rimane nel complesso contenuto ma con una tendenza all'aumento da tre settimane.** Questo avviene anche grazie alla ricerca e la gestione dei contatti, inclusa la quarantena dei contatti stretti e l'isolamento immediato dei casi secondari. La riduzione nei tempi tra l'inizio dei sintomi e la diagnosi/isolamento è uno dei motivi che permette una più tempestiva identificazione ed assistenza clinica delle persone che contraggono l'infezione.

## Conclusione /2

- **È necessario mantenere elevata la resilienza dei servizi territoriali, continuare a rafforzare la consapevolezza e la compliance della popolazione, realizzare la ricerca attiva ed accertamento diagnostico di potenziali casi, l'isolamento dei casi, la quarantena dei loro contatti stretti.** Queste azioni sono fondamentali per controllare la trasmissione ed eventualmente identificare rapidamente e fronteggiare recrudescenze epidemiche.
- **È essenziale mantenere elevata l'attenzione e continuare a rafforzare le attività di "contact tracing" (ricerca dei contatti) in modo da identificare precocemente tutti i potenziali focolai di trasmissione e continuare a controllare l'epidemia. Per questo rimane fondamentale mantenere una elevata consapevolezza della popolazione generale sulla incertezza della situazione epidemiologica e sull'importanza di continuare a rispettare in modo rigoroso tutte le misure necessarie a ridurre il rischio di trasmissione quali l'igiene individuale, l'uso delle mascherine e il distanziamento fisico.**

## Conclusione /3

- Si ribadisce nuovamente la necessità di rispettare i provvedimenti quarantenari, anche identificando strutture dedicate, sia per le persone che rientrano da paesi per i quali è prevista la quarantena, e sia a seguito di richiesta dell'autorità sanitaria essendo stati individuati come contatti stretti di un caso. In caso contrario, nelle prossime settimane, potremmo assistere ad un ulteriore aumento nel numero di casi a livello nazionale.
- La situazione descritta in questo report, relativa prevalentemente ad infezioni contratte nella fine di luglio 2020, conferma la presenza di importanti segnali di allerta legati ad un aumento della trasmissione locale. Al momento i dati confermano l'opportunità di mantenere le misure di prevenzione e controllo già adottate dalle Regioni/PPAA e di mantenere alta l'attenzione alla preparazione di interventi in caso di evoluzione in ulteriore peggioramento.
- Si raccomanda alla popolazione di prestare particolare attenzione alla possibilità di contrarre l'infezione in situazioni di affollamento in cui si osserva un mancato rispetto delle misure raccomandate. Si raccomanda inoltre di prestare attenzione al rischio di infezione durante periodi di permanenza in paesi con una più alta circolazione virale. In questi casi, si raccomanda al rientro in Italia di rivolgersi ai servizi di prevenzione per le indicazioni del caso e di prestare responsabilmente particolare attenzione alle norme comportamentali di prevenzione della trasmissione di SARS-CoV-2, in particolare nei confronti di fasce di popolazione più vulnerabili.

## Allegato 2

### CONTRIBUTO TECNICO CONGIUNTO ANCI REGIONI SULLE PROBLEMATICHE DEL TRASPORTO PUBBLICO LOCALE E SCOLASTICO CAUSATE DAL COVID19

A seguito dell'incontro fra rappresentanti della Conferenza delle Regioni e dell'ANCI, avente ad oggetto le problematiche del trasporto pubblico in vista dell'apertura dell'anno scolastico, si è convenuto quanto segue.

La crisi causata dal COVID 19 ha determinato la necessità di riorganizzare i servizi di trasporto in maniera coerente con le esigenze di tutela della salute e di massimo contenimento del rischio di contagio. Tuttavia, come da tempo e più volte rappresentato, i criteri di carico ad oggi vigenti, uniformati al principio di distanziamento interpersonale di un metro, produrrebbero un grave deficit di servizi, con gravissimi effetti sull'ordinanza ripresa dell'anno scolastico e con rilevanti ripercussioni negative sulla vita quotidiana delle persone e delle famiglie. Si tratta di problemi che a settembre riguarderanno milioni di persone in tutte le aree del Paese.

**Presupposto essenziale ed imprescindibile** per garantire i servizi di trasporto pubblico e scolastico è lo stanziamento di risorse dedicate per la loro riorganizzazione anche con servizi aggiuntivi; unitamente alle risorse occorre approvare norme urgenti e derogatorie che consentano procedure accelerate volte all'organizzazione ed autorizzazione di tali servizi aggiuntivi.

Sia le Regioni che i Comuni hanno evidenziato ormai da mesi la necessità di opportuni stanziamenti di risorse rispettivamente per il TPL che per il trasporto scolastico.

Nella bozza di decreto legge c.d. "agosto", sulla base delle notizie informali attualmente disponibili, si prevede un insufficiente stanziamento di 400 mln per le Regioni a copertura dei mancati introiti subiti dalle aziende di trasporto pubblico locale (tematica rilevante, ma distinta dall'esigenza innanzi rappresentata) mentre nulla pare sia previsto per i servizi di trasporto di competenza comunale.

Manca quindi una risposta finanziaria chiara da parte del Governo in ordine alla copertura dei costi riguardanti all'attuazione delle misure di sicurezza che implicano, come è noto, la riorganizzazione più o meno ponderosa dei servizi.

In diverse occasioni rappresentanti del Governo hanno dichiarato lo stanziamento di 300 ml a favore dei Comuni, ma allo stato non pare risulti alcuna norma di previsione. Solo per ottemperare alle esigenze delle regole inerenti il trasporto scolastico ANCI ha stimato un onere aggiuntivo di circa 200 milioni, senza considerare il trasporto urbano. E' necessario che tali stanziamenti siano previsti per i Comuni, prevedendo che siano immediatamente ripartiti e resi effettivamente disponibili.

Chiediamo pertanto una risposta certa sulle risorse rese disponibili dal Governo, accompagnate da norme derogatorie che consentano la pronta attivazione dei servizi aggiuntivi, anche mediante l'uso di mezzi di trasporto non di linea.

Per quanto riguarda **le misure da applicare**, si fa presente che il mantenimento della regola del distanziamento, con le attuali deroghe permette una capienza del TPL al massimo al 60%, che nell'urbano dove il maggior numero delle persone si muove in piedi, si riduce ulteriormente al 50%. Ciò significa o raddoppiare il servizio, complesso in termini organizzativi e di risorse, oppure lasciare a casa la metà degli studenti, nonché aumentare notevolmente il traffico privato congestionando le città e aumentando i livelli di inquinamento, costringendo metà degli utilizzatori del TPL ad utilizzare l'automobile privata. Ad esempio in Città come Roma, Milano o Napoli significherebbe, mediamente, oltre mezzo milione di automobili in più. In città come Venezia peraltro, per i collegamenti via acqua, potrebbero non esserci mezzi privati disponibili.

Già nel parere sullo schema di DPCM 14 luglio e allegate linee guida, le Autonomie territoriali avevano chiesto una revisione degli attuali criteri di distanziamento, sulla base dell'attuale situazione epidemiologica, molto diversa da quella che aveva giustificato gli attuali criteri, nonché evidenziato l'impossibilità di assicurare livelli adeguati di servizio in una fase in cui, di contro, sono riprese quasi tutte le attività economiche e produttive e stanno per riprendere, dal mese di settembre in poi, quelle scolastiche. Si ritiene di ribadire la necessità di una rivalutazione, da parte del Ministero della Salute e del CTS, delle misure prescritte, al fine di consentire un equo contemperamento delle ragioni di prevenzione sanitaria con l'interesse altrettanto rilevante ad un'ordinata ripresa delle attività scolastiche, particolarmente avvertito nelle realtà urbane medie e grandi:

Tale rivalutazione dovrebbe tener conto adeguatamente di una serie di fattori e variabili:

1. Situazione epidemiologica territoriale
2. Tempi di permanenza degli utenti nel mezzo pubblico (ad es molto basso in metro)
3. obbligo utilizzo corretto della mascherina a bordo dei mezzi
4. igienizzazione quotidiana dei mezzi;
5. adeguato ricambio di aria dall'esterno;
6. Stabilità del gruppo che usufruisce del servizio

Ad una valutazione attenta di questi ed altri fattori (valutazione che ad es. ha comportato per altri settori di trasporto la deroga assoluta al distanziamento nonostante tempi di percorrenza molto più lunghi) potrebbe aggiungersi l'adozione di ulteriori misure quali il controllo stabile dello stato di salute degli utenti.

Le Regioni ed i Comuni ritengono opportuno affermare la regola generale del controllo della temperatura corporea e dell'uso obbligatorio della mascherina idonei presupposti per l'accesso ai mezzi di trasporto scolastico e TPL anche in deroga al distanziamento prescritto dalle linee guida vigenti.

A tal proposito Regioni e Comuni ritengono utile la creazione di piattaforme digitali per l'acquisizione di autodichiarazioni relative all'assenza di un precedente contagio ed una

temperatura inferiore ai 37,5 gradi. Le modalità di accesso e di condivisione dei dati dovranno essere, evidentemente, diversificati in ragione delle caratteristiche dell'utenza:

- 1) viaggiatori del trasporto scolastico;
- 2) viaggiatori appartenenti al mondo scolastico e fruitori dei servizi generali di Tpl;
- 3) utenti generali dei servizi di trasporto pubblico.

In una prima fase tale sistema potrebbe essere utilizzato con apposite app che prevedano per le tipologie 1 e 2 la comunicazione delle auto dichiarazioni agli Istituti scolastici, mentre per la tipologia 3 con dichiarazioni ai soggetti gestori dei servizi di trasporto.

In una seconda fase, laddove vi siano risorse ad hoc disponibili, si potrebbero dotare stazioni e mezzi di trasporto di strumenti tecnologici (scanner) per la rilevazione diretta (in stazione e/o a bordo) della temperatura corporea dei viaggiatori.

Per quanto riguarda più specificamente il trasporto scolastico, Regioni e Comuni ritengono che la regola del distanziamento di un metro potrebbe essere superata sia considerato il criterio del controllo della temperatura già vigente che il criterio applicato in altri contesti, come quello lavorativo, del rapporto/gruppo stabile e continuato, del tutto soddisfatto alla luce della presenza nei bus scolastici dello stesso gruppo di alunni.

Si ribadisce che in assenza di una flessibilizzazione, il livello di trasporto scolastico potrebbe essere garantito laddove possibile, in ordine al reperimento di mezzi e risorse umane, solo a fronte di almeno 200 ml da assegnare rapidamente ai Comuni.

Inoltre, ai fini di un'adeguata programmazione dei servizi, le Regioni ed i Comuni evidenziano la necessità di avere in tempi rapidi un quadro chiaro degli orari di inizio e fine lezioni (quadro ancora in fieri presso i tavoli coordinati dalle Direzioni Regionali del MIUR) al fine di programmare servizi che evitino i picchi di congestione della domanda di trasporto pubblico nelle ore di maggiore congestione.

Data la problematicità della situazione e la ristrettezza dei tempi, Regioni e Comuni ritengono necessario:

- a) approfondire rapidamente la fattibilità in termini di costi e tempi dell'introduzione di distanziatori all'interno dei mezzi di trasporto pubblico quali strumenti per l'auspicata deroga alle regole di distanziamento per le sedute in affiancamento. Allo scopo di verificarne la fattibilità è urgente che il MIT promuova un tavolo tecnico con il CNR, il CTS, altri organismi qualificati, Motorizzazione civile, aziende costruttrici dei mezzi, rappresentative delle diverse tipologie di vetture, mezzi pubblici utilizzati per i servizi di trasporto;

b) istituire un tavolo tecnico composto da rappresentanti di MIT MIUR, CTS , Regioni Comuni e Province e Autorità garante della privacy che valuti rapidamente la possibilità di regolare l'accesso ai mezzi pubblici di trasporto previa registrazione ad apposita applicazione.

Roma , 12 agosto 2020

**COMMUNICATION FROM THE COMMISSION**

**Guidelines on the progressive restoration of transport services and connectivity – COVID-19**

(2020/C 169/02)

**I. Introduction**

1. The COVID-19 outbreak is having a major impact on transport and connectivity in the EU. Measures to contain the outbreak have resulted in a dramatic reduction in transport activity, especially in passenger transport <sup>(1)</sup>. Freight flows have been less affected, in part thanks to collective EU efforts to ensure that freight continues to move, although there has been a reduction due to declining economic activity and disruption of supply chains.
2. The Commission has issued guidance on restrictions on non-essential travel <sup>(2)</sup> and put forward measures specifically for transport, including guidelines for border management measures <sup>(3)</sup>, on the implementation of Green Lanes for freight transport <sup>(4)</sup>, on facilitating air cargo operations <sup>(5)</sup>, and on seafarers, passengers and other persons on board ships <sup>(6)</sup>. The Commission has offered guidance on how best to protect transport workers and passengers, while keeping freight moving.
3. As long as restrictions on the movement of persons remain in place and freight flows also remain liable to be affected, these measures and recommendations on the flow of goods, free movement of workers exercising critical occupations <sup>(7)</sup>, transit and repatriations of passengers and crews should continue to be applied consistently and in a coordinated way by all Member States. Member States should continue using the network of national transport contact points for COVID-19 response coordinated by the Commission.
4. As the public health situation begins to improve, it will be important that transport services and connectivity are progressively restored within the limits that the epidemiological conditions allow, since they are key enablers of the EU and the global economy, and fundamental parts of daily lives of EU citizens.
5. On 15 April 2020, the European Commission, in cooperation with the President of the European Council, put forward a Joint European Roadmap <sup>(8)</sup> setting out recommendations on lifting COVID-19 containment measures. The Joint European Roadmap announced that the Commission would also 'put forward more detailed guidance on how to progressively restore transport services, connectivity and free movement as swiftly as the health situation allows it, also in view of planning summer holiday travel'.

<sup>(1)</sup> For example, approximately -90 % of air traffic compared to a year ago (Source: Eurocontrol), -85 % long-distance rail passenger service, -80 % on regional rail passenger services (including sub-urban), near standstill on international rail passenger services (Source: CER); more than -90 % for cruise and passenger ships in mid-April compared to a year ago (Source: EMSA).

<sup>(2)</sup> COM(2020) 115 final, COM(2020) 148 final and C(2020) 2050 final (OJ C 102I, 30.3.2020, p. 12).

<sup>(3)</sup> C(2020) 1753 final (OJ C 86I, 16.3.2020, p. 1).

<sup>(4)</sup> C(2020) 1897 final (OJ C 96I, 24.3.2020, p. 1).

<sup>(5)</sup> C(2020) 2010 final (OJ C 100I, 27.3.2020, p. 1).

<sup>(6)</sup> C(2020) 3100 final (OJ C 119, 14.4.2020, p. 1).

<sup>(7)</sup> C(2020) 2051 final (OJ C 102I, 30.3.2020, p. 12).

<sup>(8)</sup> Joint European Roadmap towards lifting COVID-19 containment measures (OJ C 126, 17.4.2020, p. 1).

6. The health of citizens, including transport workers and passengers, remains the key priority. Particular consideration should be given to vulnerable populations, such as the elderly and those with underlying medical conditions, in full respect of their privacy. The easing of travel and operational restrictions should therefore be gradual to protect health and ensure that transport systems and services, and other related systems (e.g. border controls at external borders), can re-adjust to higher freight and passenger volumes. This should be accompanied by constantly updated communication campaigns to ensure that people travelling can plan and act on the basis of full awareness of the situation, and therefore also of their individual responsibility in following health recommendations when travelling.
7. The progressive restoration of transport services and connectivity will be fully dependent on the approach to travel restrictions, on epidemiological assessments, as well as on expert medical advice on necessary health and sanitary protection and precautions. These EU guidelines for the restoration of transport services and connectivity are therefore without prejudice to and should remain fully aligned and consistent with these policies, and be implemented within the framework of the Joint European Roadmap.
8. They provide a common framework to support authorities, stakeholders, social partners and businesses operating in the transport sector during the gradual re-establishment of connectivity. The guidelines consist of general principles applicable to all transport services and specific recommendations designed to address the characteristics of each transport mode and to be realistic and practical. They aim to provide further guidance on how to progressively restore transport services, connectivity and free movement as swiftly as the health situation allows it, while protecting the health of transport workers and passengers. They should be applied for transport within and between Member States. However, taking into account the cross-border nature of transport, these guidelines should be adequately applied to transport services between Member States and non-EU countries, as soon as the epidemiological situation allows for it.
9. The COVID-19 outbreak has affected the entire EU, but its impacts differ between Member States, regions and areas. To restore connectivity across the EU in a manner that is safe for all persons involved, and in order to restore public confidence in transport services, Member States and EU institutions and agencies would need to closely cooperate. An entirely risk-free environment for travel is not feasible, as is the case for any other activity, but risks should be minimised as much as possible throughout the duration of the outbreak. Until an effective vaccine is developed and widely available, a second wave of infections or clusters of outbreak remain possible; As such, appropriate plans for the eventual reintroduction of measures, if needed, should be established.
10. Given the global nature of the COVID-19 outbreak and the international nature of transport services, a framework for mutual acceptance of the public health situation and the measures in place between countries, regions and areas, including between Member States and between the EU and third countries, is indispensable for a gradual, timely and safe restoration of European, but also global transport systems. In this context, competent authorities in the EU should cooperate to the greatest possible extent with third countries countries and sectoral international organisations<sup>(9)</sup>. Measures will therefore need, as much as possible, to be aligned in their objectives and effects, and accepted as equivalent.
11. As mentioned in the Joint European Roadmap, these guidelines are also relevant in view of the summer holiday season and the planning of associated travel arrangements. Tourism is an important sector of the EU economy, and it is inherently linked to transport and travel, relying on availability of passenger transport services as a precondition and fundamental enabler of tourism. Therefore, the timely restoration of adequate connectivity will be crucial to enable the gradual restoration of tourism.

<sup>(9)</sup> Such as the International Maritime Organization, International Labour Organization, International Civil Aviation Organization, Transport Community Permanent Secretariat, etc.

## II. Principles for the safe and gradual restoration of passenger transport

### (a) General principles for restoring connectivity

12. All modes of transport services should be progressively resumed as a matter of priority, subject to the actual deployment of proportionate and effective measures to protect the health of transport workers and passengers. These measures should be in line with the general criteria, principles and recommendations set out in the Joint European Roadmap, notably with respect to the epidemiological situation and policies on border controls and restrictions on movement and travel.
13. Accordingly, measures which might restrict transport operations, as well as health-related protection and prevention measures, should remain limited, in their scope and duration, to what is necessary to protect public health. In addition to being proportionate, all measures should also be duly motivated, transparent, relevant and mode-specific, non-discriminatory and maintain a level playing field in the Single Market. Member States will have to ensure compliance of these measures with State aid rules and all other elements of EU law.
14. Measures should be continuously monitored so that they can, if appropriate, be re-evaluated and adjusted, taking into account all relevant expertise and considerations, to remain proportionate to the current level of public health needs. As new and more efficient solutions become available, their deployment should be prioritised, so that less efficient or more burdensome measures can be discontinued. The principle of cost-effectiveness should be respected. This implies that if there are several options available to achieve comparable effects in terms of ensuring the health of transport workers and passengers, the least costly one should be preferred.
15. To protect and restore the full functioning of the Single Market, the cross-border provision of transport services, full effectiveness of health-related measures, and the confidence of the public, Member States should take actions in a coordinated and cooperative way. Member States should base decisions regarding the lifting of COVID-19-related travel restrictions on the Commission guidelines on internal borders of 13 May 2020 <sup>(10)</sup>. They should be notified to the Commission and to all Member States. The Commission is ready to coordinate the lifting of restrictions and restoration of transport services through the network of national contact points.
16. This also requires a coordinated approach with countries neighbouring the EU but also beyond. The coordination channels have already been extended, for example, in the Western Balkans, to the respective national authorities that are closely working with the EU network of national transport contact points. The shared objective is to ensure the provision of transport services and connectivity.
17. In line with the above-mentioned principles that measures should be proportionate and mode-specific, safe mobility options should be identified instead of general prohibitive measures that lead to the paralysis of transport services within the EU. An example could be the intensified and regular cleaning, disinfection and appropriate ventilation of transport hubs and vehicles <sup>(11)</sup>, instead of entirely prohibiting the relevant transport services. This approach should allow targeting of risk sources while enabling the gradual return of regular economic and daily activities. Close cooperation between health and transport authorities as well as key stakeholders will be crucial in this regard.

<sup>(10)</sup> Communication from the Commission – Towards a phased and coordinated approach for restoring freedom of movement and lifting internal border controls – COVID-19 of 13 May 2020.

<sup>(11)</sup> In this Communication the term 'vehicle' refers, as relevant in the given context, to all types of vehicles, including, *inter alia*, cars, trucks, buses, coaches, trains, aircraft, ships, boats, ferries, etc.

18. Transport of freight should continue to be safeguarded to ensure that supply chains are functional. The Joint European Roadmap indicated that 'in the transition phase, the efforts to maintain an unobstructed flow of goods and to secure supply chains should be reinforced'. Starting from the current maximum 15 minutes for crossing green lane borders, the controls performed should gradually be eased in a coordinated way, using established coordination channels such as the national transport contact points for COVID-19 and the Integrated Political Crisis Response (IPCR), to ultimately allow crossing internal borders as before the introduction of COVID-19-related restrictions for all freight vehicles and all goods. As traffic will increase again, the role of multimodal hubs, such as ports or container terminals, in supporting the green lanes deserves special attention. Best use should be made of all transport modes, including inland waterways and rail freight, to guarantee functioning supply chains. Free and unobstructed movement of essential transport workers needs to be assured, and for that purpose the access to fast-track lanes at transport hubs should be considered. During the gradual transition, and following public health authorities recommendations, health checks should be reduced gradually, systematic quarantines (i.e. applied irrespective of symptoms displayed or any test results) should be lifted, convoys should be abolished, driving bans could be reintroduced if the fluidity of traffic allows and further derogations from driving and rest time rules after the end of May 2020 should become more harmonised and limited to what is strictly necessary, to gradually re-instate uniform and easily enforceable EU rules.
19. As soon as the public health situation allows, restrictions on individualised transport (e.g. cars, motorcycles or bicycles) should be lifted. Loosening restrictions allows an early resumption of mobility especially at the local and regional level (e.g. allowing people to travel further and faster at local level or within a Member State). The lifting of these restrictions to facilitate individualised transport should remain aligned with the broad distancing measures and prevention measures required or recommended by each Member State.
20. At the same time, the availability of safe collective transport options should be ramped up, in line with the gradual de-confinement, to provide mobility alternatives for all citizens. This should be carried out and communicated in a manner that helps to restore the trust and confidence of passengers regarding the safe use of collective transport.
21. It should be ensured that transport operators and service suppliers that provide equivalent services for the same route are subject to equivalent measures. The objective should be to provide the same level of safety, clarity and predictability for passengers, to avoid discrimination and to preserve the level playing field.
22. To ensure that measures at departure and arrival on any transport mode are comparable, thus avoiding that travel becomes either overly cumbersome or even impossible, it is crucial to ensure that equivalent measures, that are based on shared principles and that each mitigate in an adequate way the relevant health risks, are mutually accepted at the point of departure and of arrival. Coordination between Member States and with non-EU countries should facilitate this.
23. In order to allow more informed journey planning, transport operators and service suppliers could make available information on the average occupancy rates for particular connections or hours. It will be especially important for services without seat reservations and for local public transport. Such information could be made available online or through dedicated mobile applications.
24. Urban mobility is already being re-thought in several Member States, regions and cities, such as extending pavements and bicycle paths, adapting timetables and developing innovative technologies to manage passenger flows and avoid crowding. The Commission encourages and supports the development and implementation of new urban mobility solutions and measures to facilitate active, collective and shared mobility in a safe manner, and to ensure trust among citizens.
25. Where necessary, clear rules on the rights and duties of transport operators and service providers should apply, e.g. if operators are responsible for ensuring distancing or refusing access to a transport hub or vehicle without a mask or if certain maximum numbers of passengers are exceeded, the legal framework granting them authority to put in place these measures should be clearly defined.

(b) *Protecting transport workers*

26. Transport workers in all modes have played a critical role in the crisis in delivering freight, supporting the functioning of supply chains, repatriating EU citizens, and transporting essential workers to their jobs, even at heightened risk to their own health and wellbeing. Transport hubs, service providers and operators should apply business continuity principles to ensure continuous safe operations in consultation with social partners. This also means that transport workers should be adequately consulted, equipped, trained and instructed on how to carry out their duties while minimising risks to their own health, that of their families, and also the health of their co-workers and passengers. This should include, for example, information on how to adequately use protective equipment, keep up hygiene, minimise unnecessary contacts with others, and also, to the extent feasible, how to spot potential infections.
27. Transport workers who are required, due to the nature of their work, to have a high level of interaction with others (e.g. aircrews, security and safety inspection personnel at airports and ports, ticket controllers, bus and van drivers, passenger vessel crews, maritime pilots, staff providing assistance to passengers, including persons with disabilities and reduced mobility) should be provided by their employers with the appropriate level of personal protective equipment, as further outlined below. Regular changes of such equipment should be ensured as necessary, as well as their safe disposal. General guidance for employers on return to workplaces after COVID-19 was published by the European Agency for Safety and Health at Work and includes useful information regarding specific sectors, including the transport sector <sup>(12)</sup>.

(c) *Protecting passengers*

28. For all collective forms of passenger transport, reasonable measures to limit contact between transport workers and passengers, as well as between passengers, should be taken. Where feasible, distancing practices between passengers should be applied as long as the overall health situation requires it. Other measures that reduce the risk of infections should be applied, such as:
- a. Wearing of personal protective equipment (masks, gloves, etc.) by transport workers.
  - b. Reducing, where feasible, the density of passengers in collective means of transport and in waiting areas (the operation of such lower capacity services could be adequately supported to maintain viability, e.g. through temporary public service obligations in line with the applicable EU rules <sup>(13)</sup>).
  - c. Maintaining or adding protective barriers in hubs and vehicles (e.g. around drivers, at ticket stands or controls).
  - d. Setting up dedicated lanes or otherwise separating different passenger flows at transport hubs (i.e. ports, airports, train stations, bus stops, ferry landings, urban public transport hubs, etc.).
  - e. Hubs should remove facilities that encourage crowding (e.g. benches, tables) or, at least, re-arrange them to ensure adequate distancing.
  - f. Clearly displaying accessible information on recommended behaviour (e.g. frequent hand washing or sanitising, keeping adequate distance) and on the specific measures in place in that particular transport hub or transport mode.

<sup>(12)</sup> 'COVID-19: guidance for the workplace' and 'COVID-19: Back to the workplace – Adapting workplaces and protecting workers', [https://oshwiki.eu/wiki/COVID-19:\\_guidance\\_for\\_the\\_workplace#See](https://oshwiki.eu/wiki/COVID-19:_guidance_for_the_workplace#See)

<sup>(13)</sup> Regulation (EC) No 1370/2007 of the European Parliament and of the Council of 23 October 2007 on public passenger transport services by rail and by road and repealing Council Regulations (EEC) Nos 1191/69 and 1107/70 (OJ L 315, 3.12.2007, p. 1); Regulation (EC) No 1008/2008 of the European Parliament and of the Council of 24 September 2008 on common rules for the operation of air services in the Community (OJ L 293, 31.10.2008, p. 3); Council Regulation (EEC) No 3577/92 of 7 December 1992 applying the principle of freedom to provide services to maritime transport within Member States (maritime cabotage) (OJ L 364, 12.12.1992, p. 7).

- g. Adequate measures at boarding and at security checks (e.g. passengers not entering or leaving buses by the front door, opening of doors by default, disinfection of trays) and other measures that help to minimise contact (e.g. on short ferry routes staying in the car or truck could be allowed if overall safety can be sufficiently ensured).
- h. The transport of persons with disabilities and reduced mobility as well as elderly should be given priority. Transport workers who, in line with the EU rules on passenger rights, provide assistance to persons with disabilities and reduced mobility as well as elderly, should be provided with the necessary personal protective equipment.
29. Passengers should wear face masks in transport hubs and vehicles used for collective transport, especially where physical distancing measures cannot be fully observed at all times <sup>(14)</sup>. Accessible information material for passengers on safe behaviour (keeping distance, cleaning hands, etc.) should be prominently displayed. Protocols for the management of potential infections in these facilities should be set up and clearly communicated to transport workers and readily available to passengers.
30. Where physical distancing is more difficult to ensure, additional safeguards and measures leading to equivalent levels of protection should be put in place. Furthermore, in case that different alternatives exist for reaching a destination, preference should be given to those options where physical distancing can be adequately ensured, in line with recommendations of public health authorities.
31. Reducing the risk of infections at transport hubs and vehicles in all modes should be a priority. Intensified and regular cleaning and disinfection of transport hubs and vehicles should be implemented for all transport modes. Availability of sanitising/disinfecting gel should be ensured at transport hubs and in vehicles.
32. Facilities should be provided and protocols implemented at transport hubs to immediately isolate persons with suspected COVID-19 infections until further appropriate measures can be taken. For this purpose, designated safe areas should be set up and dedicated, trained staff with adequate protective equipment should be ensured. Existing medical facilities and medical staff (e.g. at airports, ports or on board ships) should be reinforced to deal with increasing traffic volumes as restrictions are lifted.
33. Electronic sales of tickets and advanced seat reservations should be prioritised to reduce gatherings of groups of travellers in specific areas (i.e. ticket machines and sales points) and to better control the permitted number of passengers, while ensuring accessibility to ticket sales for people having no access to electronic means or who are unable to use such electronic means. As far as possible, a contactless environment should be favoured.
34. Sales of other goods, including food and beverages, may be limited in vehicles. To lower the risk of infections, operators of integrated travel retail locations, such as duty free shops, should take adequate measures, including, for example: managing passenger flows to ensure distancing (including the use of floor markers, optimising layouts, if necessary restricting customer numbers); regular cleaning and disinfection of locations, equipment and merchandise; setting up barriers between customers and retail staff at till points; providing sufficient hand-sanitising stations throughout the retail location and requiring their use, in particular at entry and exit points; providing clearly visible information for customers on appropriate safe behaviour; and ensuring that retail staff is adequately trained and equipped to deal with customers and merchandise in line with guidance provided by health authorities on safe behaviour during the COVID-19 outbreak.

<sup>(14)</sup> 'Face masks' is a generic term which covers both medical and non-medical masks. ECDC indicates that 'The use of non-medical face masks made of various textiles could be considered, especially if – due to supply problems – medical face masks must be prioritised for use as personal protective equipment by healthcare workers' (<https://www.ecdc.europa.eu/sites/default/files/documents/COVID-19-use-face-masks-community.pdf>). It will be for national health/safety authorities to specify further in their discussion with stakeholders per transport mode, based on epidemiological risk in that country, availability and other considerations. Certain transport workers and passengers, respectively, may be exposed to different levels of risk.

35. In addition to other measures aimed at limiting the risk of infection, contact tracing and warning measures, for example, with the use of mobile apps, could be used, on a voluntary basis, by passengers to detect and interrupt infection chains and reduce the risk of further transmission as long as transmission risks persist. Access to transport services should not be made subject to the use of contact tracing apps. Due to the cross-border nature of transport, it is important to ensure the interoperability and mutual acceptance of such measures. If they are implemented, contact tracing measures should be strictly limited for the purposes of dealing with the COVID-19 outbreak and set up in line with the Common EU toolbox of the eHealth Network on mobile applications to support contact tracing in the EU's fight against COVID-19 <sup>(15)</sup>, the Commission Guidance on apps <sup>(16)</sup> and the Guidelines of the European Data Protection Board <sup>(17)</sup>, ensuring the highest level of data privacy.
36. Transport operators and service providers should have in place specific protocols in case passengers fall sick or show COVID-19 symptoms during or immediately after travelling or being at a transport hub. Such protocols should include clearly identified safe areas for symptomatic passengers, defined steps on how to minimise their exposure to other passengers and transport workers, how to collect and analyse all relevant information on contacts with other passengers and transport workers, etc. For travel with reservations, this should include the possibility to identify and alert fellow passengers who were in their proximity.

(d) *Going forward*

37. In order to restore regular levels of transport services and connectivity, a flexible combination of increased use of suitable personal protective equipment, appropriate and safe ventilation, if possible using outdoor air and avoiding mere circulation of indoor air, increased voluntary contact tracing capacities and decontamination capabilities will be necessary in the absence of a vaccine.
38. In the medium/long-term, it is recommended that all extraordinary measures put in place during the COVID-19 outbreak should be continuously monitored, assessed and reconsidered on a timely basis unless the epidemiological situation requires to extend them, or where these measures have been beneficial in terms of improving transport systems and efficiency.
39. The ongoing application of containment measures, as well as their easing and the progressive restoration of transport services and connectivity should not lead to a reduction, even if only temporarily, of the high levels of EU safety and security standards in transport, including health and safety of transport workers. It is necessary to avoid adding transport safety or security issues on top of the issues we are facing due to the COVID-19 outbreak.

**III. Practical guidance on specific measures to ensure safe passenger transport for all modes in the context of the COVID-19 outbreak**

(a) *Cross-cutting recommendations*

40. The above-mentioned principles should guide the overall progressive re-start and increase of passenger transport across the EU for all modes of transport during the exit from COVID-19 restrictions and the subsequent recovery. These common principles should facilitate the mutual acceptance of implemented measures within the EU, but also vis-à-vis non-EU countries, to enable effective continuation of transport services. As stated in the previous section, some principles and measures should be applied for transport hubs and vehicles for all modes of transport, with specific adjustments taking into account the mode-specific circumstances, needs and feasibility.
41. Such cross-cutting measures include in particular:
- a. At least during the initial relaxation of restrictions, the number of passengers may need to be reduced on vehicles in certain transport modes to ensure that any applicable physical distancing requirements are adequately observed.

<sup>(15)</sup> [https://ec.europa.eu/health/sites/health/files/ehealth/docs/covid-19\\_apps\\_en.pdf](https://ec.europa.eu/health/sites/health/files/ehealth/docs/covid-19_apps_en.pdf)

<sup>(16)</sup> Communication from the Commission Guidance on Apps supporting the fight against COVID 19 pandemic in relation to data protection (OJ C 124I , 17.4.2020, p. 1).

<sup>(17)</sup> [https://edpb.europa.eu/our-work-tools/our-documents/guidelines/guidelines-042020-use-location-data-and-contact-tracing\\_en](https://edpb.europa.eu/our-work-tools/our-documents/guidelines/guidelines-042020-use-location-data-and-contact-tracing_en)

- b. Voluntary use of contact tracing apps should be considered as an additional layer of risk mitigation.
  - c. Transport workers should be equipped with PPE and, where possible, separated with barriers from passengers.
  - d. Frequent cleaning and disinfection of hubs and vehicles, and increased frequency of waste collection.
  - e. Systematic installing of hand-sanitising stations and requiring their use whenever feasible.
  - f. Strengthening ventilation, air filtering and, where appropriate, prioritising use of natural air.
  - g. The wearing of masks by passengers, especially where distancing measures cannot be fully observed at all times.
  - h. Tickets and information should be provided electronically and automatically. Electronic pre-sales of tickets should be strongly promoted and prioritised, as well as advanced check-in, reservation and registration procedures.
  - i. Check-in, loading and unloading of luggage should be organised so that crowding of passengers is avoided.
  - j. Pre-ordering of on-board services and meals should be, where possible, facilitated at the time of booking, to reduce contact between staff and passengers.
  - k. Accessible information on implemented safe behaviour procedures, as well as required protective equipment for passengers, should be prominently displayed at hubs and in vehicles, and made available in advance of any travel.
42. Stakeholder organisations, operators and service providers active in the different transport modes should develop and implement adequate measures that address the specific circumstances of each mode. They should be in line with the general and mode-specific principles and recommendations set out in these guidelines. Those measures should be continuously reviewed and, where necessary, adapted to ensure their effectiveness in protecting the health of transport workers and passengers.
43. Furthermore, the following measures, taking into account the specific characteristics and needs of each transport mode, should be implemented and applied:

(b) *Aviation*

44. Aviation has longstanding experience in the field of risk management in safety and security, and is used to operating in a highly controlled environment. Regaining the confidence of passengers that aviation is a safe travel mode will be instrumental for exiting this crisis. To this effect, it will be essential that aviation and health stakeholders communicate widely on the measures in place, as well as on how these measures mitigate the risks. The aviation sector should make sure that measures are highly visible, coordinated, and communicated to passengers at all times.
45. Mitigating the risk of spread of COVID-19 should follow the same principles used for safety and security risk management, including monitoring compliance, reviewing the effectiveness of measures at regular intervals, and adapting measures to changing needs and improved methods and technologies – taking into account, however, that airports and airlines are not qualified to provide health services, such as taking health screening decisions on passengers, which should be implemented by the competent authorities.
46. To ensure that measures at departure and arrival are comparable, thus avoiding that travel becomes either overly cumbersome or even impossible, it is crucial to ensure that equivalent measures, that are based on shared principles and that each mitigate in an adequate way the relevant health risks, are mutually accepted at the point of departure and of arrival. To facilitate this, it is useful to develop concrete criteria that should be translated in an internationally recognised approach. Using equivalent standards and applying reciprocity as regards measures and their acceptance can be fundamental enablers of aviation in the EU and in the global context. Therefore, close cooperation with non-EU countries and international partners, including the International Civil Aviation Organization (ICAO), will be essential.

47. In collaboration with the Commission, the European Centre for Disease Prevention and Control (ECDC) and competent authorities, the European Union Aviation Safety Agency (EASA) will put forward in the coming weeks technical operational guidelines to facilitate a coordinated approach and assist national aviation authorities, airlines, airports and other aviation stakeholders. These technical operational guidelines will take into account the safety management principles developed to ensure the safety of the European aviation system and will set out a baseline aviation health safety protocol, proposed for application across the EU.
48. The protocol should include the following measures:
- a. Strengthening ventilation, hospital grade air filtering and vertical airflow.
  - b. Limiting contamination risks along the travel process (e.g. avoiding concentration of passengers, limiting interaction on board, exploring the most appropriate allocation of seats based on technical constraints, and prioritising electronic documents and means of payment).
  - c. Reducing movement in the cabin (e.g. less cabin baggage, fewer interactions with the crew).
  - d. Adequately managing passenger flows (e.g. advise on early arrival time at the airport; prioritising electronic/self-check-in; ensuring distancing and minimising contacts at baggage drop-offs, security and border control points, at boarding, and during baggage collection); accessible information on airport processes should be provided to passengers in advance of travel.
49. The forthcoming EASA/ECDC technical operational guidelines will specify additional mitigation measures, in close coordination with national competent authorities, with the aim of deploying measure for the operation of flights coherently across the EU.

(c) *Road transport*

50. High levels of hygiene in all parts of terminals, rest areas (e.g. along the motorways), covered parking facilities, fuelling and charging stations, should be ensured, including regular cleaning and disinfections, to limit the risk of contagion for road users. Passenger flow management should be implemented at stations. Where adequate levels of public health cannot be ensured, the closing of certain stops or stations should be considered.
51. Bus and coach transport: For travelling to gradually resume by buses and coaches, appropriate measures, distinguishing regional and long distance services, will be needed. Especially for international bus/coach services, approaches should be coordinated among Member States and operators in order to be effective. Safe operating practices should be introduced, including, for example, rear door boarding and the use of windows for ventilation as much as possible instead of air conditioning. In addition, seating should be optimised to the extent feasible (e.g. families can sit together, while persons not travelling together should be separated). In mini-buses passengers should not be allowed to sit next to the driver unless physical separation is possible. Operators of regular bus services will have to be enabled to progressively re-build the network, depending on national restrictions. To facilitate this, Member States should put in place simplified and rapid procedures to allow operators to swiftly adapt their services, without compromising the health and safety of transport workers. If possible, staff contacts with passengers' luggage should be limited and passengers should handle the loading and unloading of their own luggage.
52. Transport by car/van on demand (taxi, PHV): Taxi and PHV services have largely continued with specific protection measures for drivers and limitations to only one passenger or several people living in the same household. These services should continue operating with specific hygiene and risk mitigating measures. Companies should provide drivers with masks and disinfectants. Vehicle interiors should be disinfected as frequently as possible. Taxi and PHV drivers should avoid physical contact with passengers and electronic payment should always be prioritised. Companies should provide drivers with physical separators (e.g. plastic curtains or barriers) for vehicles to limit contact with passengers. Passengers should not be allowed to sit next to the driver unless physical separation is possible. Companies should share relevant information with passengers before the trip.

## (d) Rail transport

53. For passenger transport to resume, it will be important to assure passengers that taking collective transport is safe. Measures need to be well communicated, visible and effective. Especially for international rail services, measures need to be coordinated among Member States and operators in order to be effective. The rail sector associations and worker organisations are working towards common rules.
54. Given the high number of passengers transported daily, and the number of stations served, compliance with the general rules for safe behaviour to protect public health, in particular adequate distancing, also depends on the diligence and sense of responsibility of each passenger. Random controls should ensure a good level of compliance.
55. As railways have continued to function throughout the COVID-19 outbreak, there is already a number of measures in place that can be retained and adapted where necessary:
- a. Distancing obligations should be applied on trains where needed, in particular as long as passenger numbers are relatively low. To enable distancing, frequency and capacity of trains should be increased if necessary to reduce passenger density.
  - b. Rail operators should implement mandatory seat reservations on long-distance and regional trains, with identification of name/origin and destination of passengers. Alternatively, and especially for short-distance trains, passengers should be required to leave seats empty between them, except for passengers from the same household.
  - c. Rail operators should make use of on-board passenger counting systems especially available for commuter and suburban trains (based on weight, footsteps in the door areas, and also CCTV counting algorithms which do not allow for identification of individuals) to manage capacity. The timetabling and path allocation may need flexible adjustments, including optimising capacity in a coordinated manner to reflect demand and the need to reduce passenger density.
  - d. Passenger flow management should be implemented at stations. Where adequate levels of public health cannot be ensured, the closing of certain stops or stations should be considered.
  - e. Off-peak hour travel should be encouraged with incentives, such as adjusted pricing, or flexible working hours in the case of commuter trains, to avoid crowding.
  - f. To avoid that passengers have to touch door handles or buttons, doors should be opened at each stop either automatically or remotely by the driver.
56. The European Agency for Railways (ERA), which has relevant expertise with railway operations and with Common Safety Methods, as well as an extensive network of communication channels (with authorities, operators, and manufacturers), is ready to play a key role to ensure sharing of best practices. The Shift2Rail Joint Undertaking is already exploring possibilities to support the development of apps, based on anonymised and aggregated data <sup>(18)</sup>, to understand crowding at stations, which could also benefit public transport.

## (e) Waterborne transport

57. Waterborne passenger transport has been significantly reduced. Measures to ensure public health will be necessary to restore trust and confidence of both passengers and crews. Measures should be tailored to the type of vessel and character and length of the voyage, which can vary significantly in the waterborne sector. There may be a need to increase the number of vessels and voyages, especially where transport by ferries is essential for reasons of connectivity with remote areas and islands.

<sup>(18)</sup> Commission Recommendation (EU) 2020/518 of 8 April 2020 on a common Union toolbox for the use of technology and data to combat and exit from the COVID-19 crisis, in particular concerning mobile applications and the use of anonymised mobility data (OJ L 114, 14.4.2020, p. 7)

58. Measures for maritime transport workers are detailed in the Guidelines on protection of health for persons on board ships <sup>(19)</sup>. Workers, including those on board ships and in ports, should have access to personal protective equipment <sup>(20)</sup> and adequate medical care at all times during their work. Direct interactions between persons on board should be reduced as far as possible to avoid the risk of transmission.
59. The European Maritime Safety Agency (EMSA) is ready to facilitate sharing of best practices and information that can be useful to the competent authorities and stakeholders (e.g. on vessel tracking, health reporting, etc.). Moreover, considering the international nature of shipping, cooperation with non-EU countries and international organisations, including the International Maritime Organization (IMO), will be important to facilitate global cooperation, and equivalence and reciprocity between COVID-19-related measures and practices.
60. Building on existing experience and measures already applied by Members States, operators and all other entities involved in waterborne transport (ports, ferry terminals, relevant national authorities) should apply the following measures:
- a. Ensure distancing requirements can be observed on vessels, including by reducing the number of allowed passengers.
  - b. Limit access to (dis)embarkation quays to passengers with tickets; assign seats to passengers.
  - c. Ports should consider dedicated lanes to separate entry and exit of passengers.
  - d. When conditions allow for it, move as many passengers as possible to open spaces of the vessel.
  - e. In case passengers are recommended or requested to remain in their vehicles on board ferries during short voyages (e.g. less than one hour), such a measure should apply on open decks only, unless additional safety precautions are taken in line with applicable EU rules. Where needed, capacity of decks should be adjusted to ensure safety and personnel trained in fire suppression should be present.
  - f. Cleaning and disinfection of vessels and onshore facilities should follow the 'Suggested procedures' <sup>(21)</sup> of the EU Healthy Gateways Joint Action.
  - g. Cruise ships and, where relevant, ferries should develop dedicated protocols for cleaning and hygiene that minimise the risk of cross-contamination between passenger cabins.
  - h. Protocols should be developed between ship operators and onshore facilities for persons with a suspected or confirmed COVID-19 infection, including measures before, during and after the voyage. For this purpose, health screening procedures should be available, rooms for quarantine provided and adequate interaction with the person in quarantine organised.
  - i. Cruise ships should have adequate testing capacity for COVID-19 on board, to be used when a passenger or crew member is suspected of being infected.
61. Previous COVID-19 outbreaks on cruise vessels have highlighted the particular vulnerability of closed environments during long voyages. Before cruise ships resume operations, ship operators should put in place strict procedures to reduce the risk of transmission on board and to provide adequate medical care in case of infections. The gradual restoration of cruise services should be coordinated at EU and international level, taking into account the public health situation in the countries concerned. Before starting journeys, cruise ship operators should ensure with ports along the route that, if needed, they can make arrangements for passengers

<sup>(19)</sup> Communication from the Commission Guidelines on protection of health, repatriation and travel arrangements for seafarers, passengers and other persons on board ships (OJ C 119, 14.4.2020, p. 1).

<sup>(20)</sup> EU Healthy Gateways Joint Action, Overview of Personal Protective Equipment (PPE) recommended for staff at Points of Entry and crew on board conveyances in the context of COVID-19.

<sup>(21)</sup> Suggested procedures for cleaning and disinfection of ships during the pandemic or when a case of COVID-19 has been identified on board; [https://www.healthygateways.eu/Portals/0/plcdocs/EU\\_HEALTHY\\_GATEWAYS\\_COVID-19\\_Cleaning\\_Disinfection\\_ships\\_09\\_4\\_2020\\_F.pdf?ver=2020-04-09-124859-237](https://www.healthygateways.eu/Portals/0/plcdocs/EU_HEALTHY_GATEWAYS_COVID-19_Cleaning_Disinfection_ships_09_4_2020_F.pdf?ver=2020-04-09-124859-237)

and crew members to receive medical treatment and that repatriations and crew changes can be organised. To ensure the continuity and safety of the maritime transport, the Commission will continue taking steps to facilitate and coordinate the efforts of Member States to enable crew changes in their ports.

(f) *Urban mobility*

62. In many cities and regions, public transport (buses, metros, trams, urban and sub-urban trains, etc.) has continued to function throughout the COVID-19 outbreak. To prepare for times when passenger numbers increase again, measures should be put in place as appropriate, in order to ensure the highest safety for passengers, such as:
- a. Requiring safe minimum distancing, for instance, making use of stickers or floor markings to guide passengers in vehicles to keep a safe distance.
  - b. Contacts between drivers and passengers should be minimised (e.g. by using barriers, closing front door entrances, promoting electronic tickets and payment methods)
  - c. Increasing and adapting operational frequency, as well as readjusting lines, to allow safe minimum distancing when passenger numbers increase and to better serve some destinations (e.g. where demand is particularly high).
  - d. To avoid that passengers have to touch door handles or buttons, doors should be opened at each stop either automatically or remotely by the driver.
  - e. Optimising passenger flows at stations and transport hubs to avoid crowding and peak hours, and to minimise contacts, through the use of innovative technologies and mobile applications (e.g. predicting density and crowds, installing passenger counters at doors with a maximum limit, organising travel time slots by appointment, etc.), and allowing flexibility in work hours.
63. It is essential to communicate clearly all the measures taken, to facilitate their smooth implementation, reassure citizens and maintain their confidence in public transport. Communication campaigns (e.g. 'stand on stickers') have also been shown to be effective. Many of the measures that might be required (e.g. managing crowds, access to transport hubs and vehicles, maintaining physical distancing, etc.) have effects that go beyond the remit of public transport and should be developed in cooperation with health authorities and other stakeholders, with a clear definition of the rights and obligations of each actor. The resulting extra costs could be incorporated into public service contracts.
64. Shared mobility solutions: Shared mobility companies should take various measures to protect drivers and passengers from infection. Rental vehicles should be thoroughly disinfected after each use, and vehicles used for car-sharing should be disinfected at least once on every day of use. There should be increased disinfection of station-based services (e.g. shared bicycles). E-scooter and e-bike rental companies should disinfect scooters and bikes at least with each battery change.
65. Active mobility: Many European cities are taking steps to make active mobility (e.g. walking and cycling) a safe and more attractive mobility option during the COVID-19 outbreak. Urban areas could consider temporary enlargements of pavements and increased space on the road for active mobility options to facilitate the needs of the population to move in a safe and efficient way, while reducing speed limits of vehicles in increased active mobility areas.
66. Sharing of best practices, ideas and innovations for safe mobility in urban and sub-urban areas during the COVID-19 outbreak has started through dedicated platforms and networks, and it is key to further develop such cooperation and knowledge sharing. The Commission will also gather Member States, local authorities and stakeholders active in the field of urban mobility in order to analyse the impact of this outbreak, draw lessons and gather experiences gained so far, and identify the opportunities for future, more sustainable mobility in the EU, in line with the European Green Deal.

#### IV. Conclusion

67. The Commission will continue working with other EU institutions, agencies and bodies, Member States, transport stakeholders and international partners to coordinate actions and to facilitate the implementation of these guidelines in a transparent and objective way. The Commission will in particular monitor that containment measures and their progressive lifting do not undermine the Single Market or create discriminatory effects contrary to the Treaties between EU transport operators and service providers, and that they do not discriminate between EU citizens or workers on grounds of nationality.
68. The situation remains dynamic and the Commission will continue to work with competent authorities, stakeholder organisations, transport operators and services providers to adjust and update our approaches and measures, taking into account latest epidemiological developments, feedback on the effectiveness of existing measures, and the needs of EU citizens and our economy. As long as the COVID-19 outbreak continues, public authorities, stakeholders and citizens need to remain vigilant, keeping up a high level of preparedness for a potential increase in infections. In this context, the Commission will continuously monitor the application of these guidelines and update them if necessary to ensure their effectiveness in the changing circumstances.
69. While focusing on restoring transport services and connectivity, it is necessary to look towards the sustainable and smart recovery of the EU transport sector so that it can regain its pre-crisis strength, remain globally competitive and continue to be a fundamental part of the EU economy and citizens' lives. Lessons learnt from the COVID-19 crisis will be reflected in the upcoming Sustainable and Smart Mobility Strategy in 2020.



# COVID-19 in children and the role of school settings in COVID-19 transmission

6 August 2020

## Key messages

- A small proportion (<5%) of overall COVID-19 cases reported in the EU/EEA and the UK are among children (those aged 18 years and under). When diagnosed with COVID-19, children are much less likely to be hospitalised or have fatal outcomes than adults.
- Children are more likely to have a mild or asymptomatic infection, meaning that the infection may go undetected or undiagnosed.
- When symptomatic, children shed virus in similar quantities to adults and can infect others in a similar way to adults. It is unknown how infectious asymptomatic children are.
- While very few significant outbreaks of COVID-19 in schools have been documented, they do occur, and may be difficult to detect due to the relative lack of symptoms in children.
- In general, the majority of countries report slightly lower seroprevalence in children than in adult groups, however these differences are small and uncertain. More specialised studies need to be performed with the focus on children to better understand infection and antibody dynamics.
- Investigations of cases identified in school settings suggest that child to child transmission in schools is uncommon and not the primary cause of SARS-CoV-2 infection in children whose onset of infection coincides with the period during which they are attending school, particularly in preschools and primary schools.
- If appropriate physical distancing and hygiene measures are applied, schools are unlikely to be more effective propagating environments than other occupational or leisure settings with similar densities of people.
- There is conflicting published evidence on the impact of school closure/re-opening on community transmission levels, although the evidence from contact tracing in schools, and observational data from a number of EU countries suggest that re-opening schools has not been associated with significant increases in community transmission.
- Available evidence also indicates that closures of childcare and educational institutions are unlikely to be an effective single control measure for community transmission of COVID-19 and such closures would be unlikely to provide significant additional protection of children's health, since most develop a very mild form of COVID-19, if any.
- Decisions on control measures in schools and school closures/openings should be consistent with decisions on other physical distancing and public health response measures within the community.

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## Glossary

The school structures within the EU/EEA Member States and UK are heterogeneous, with children entering and moving through educational establishments at different ages [3]. Given this variation, it is not possible to define the age of attendance in EU education establishments with full consistency. Therefore, for the purposes of this document, the following classification has been used:

Preschools	Establishments including childcare and daycare centres, nurseries and kindergartens for children under five years of age, although these may include older children in some EU settings.
Primary schools	Establishments providing early-years compulsory education, which in most EU settings include children aged 5–11 years.
Secondary schools	Education establishments for children aged 12–18 years.
Schools	The generic term used to define all educational establishments within the scope of the document, and it can be inferred that this includes all three categories of schools referred to above, unless otherwise stated.
Staff	Includes teachers, administrators and management, school nurses, janitors, cleaning and kitchen personnel, and other adults working in childcare and educational settings.

## Scope of this document

The aim of this document is to provide an overview of the epidemiology and disease characteristics of COVID-19 in children (0–18 years) in EU/EEA countries and the United Kingdom (UK), and an assessment of the role of childcare (preschools; ages 0–<5 years) and educational (primary and secondary schools; ages 5–18 years) settings in COVID-19 transmission.

## Target audience

The target audience for this report is public health authorities in EU/EEA countries and the UK.

## Background

Although fewer than 5% of COVID-19 cases reported in EU/EEA countries and the UK have been in persons under 18 years of age, the role of children in SARS-CoV-2 transmission remains unclear, especially in the context of educational settings. Available evidence to date indicates that children most probably contract COVID-19 in their households or through contact with infected family members, particularly in countries where school closures and strict physical distancing has been implemented [4,5].

Following the declaration of COVID-19 as a global pandemic in early March, many EU/EEA countries and the UK began to close schools to limit the spread of the virus, despite limited evidence as to whether childcare and educational settings play a role in transmitting SARS-CoV-2. These decisions were based on what is known of the impact of pre-emptive early school closures on transmission of pandemic influenza. In recent months, Member States have adjusted policies on schools as the pandemic has progressed.

In week 9 (9–15 March), 42% (13/31) of EU/EEA countries and the UK had closed preschools, 64% (20/31) primary schools, and 48% (15/31) (Figure 1).

By week 17 (20–26 April) 2020, 80% (25/31) of EU/EEA countries and the UK had fully or partially closed preschools, 90% (28/31) had closed primary schools and 100% had closed secondary schools or higher education establishments (31/31).

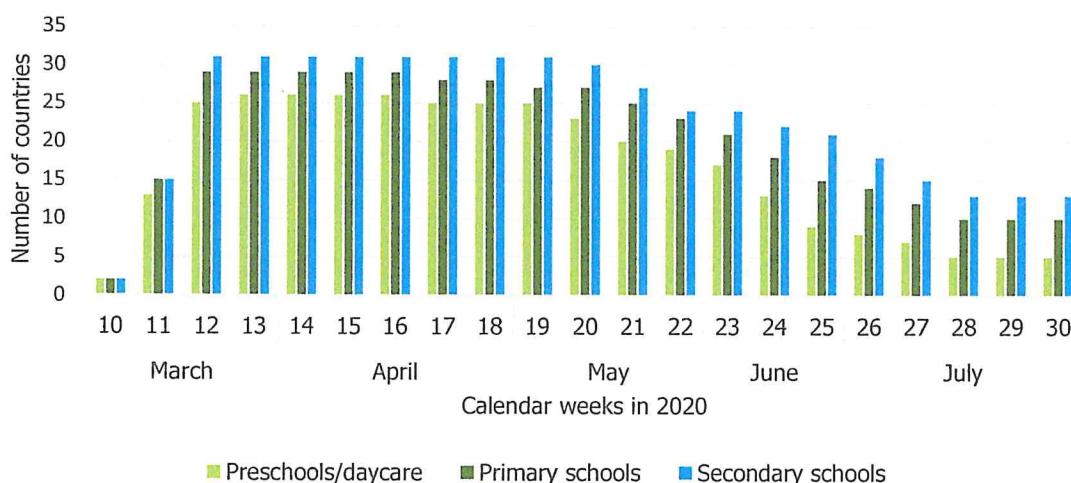
From mid-May, following reduction in the number of COVID-19 cases and/or deaths, EU/EEA countries started to partially re-open schools. In the week beginning 18 May (week 21) 20 countries (65%) reported closure of preschools and 25 (80%) reported closure of primary schools; respectively five and three countries less than the previous month.

From mid-June, EU/EEA countries had removed closure notices in the majority of preschool and primary schools and in the week beginning 15 June (week 25) closures were in place in only nine (29%) and 15 (48%) countries respectively, but secondary school closures remained in place in 21 countries (68%). Irrespective of their policies on closure, by this time schools in many European countries had started summer holidays (exact dates vary across and within countries).

As of week 30 (20–26 July), 67% (21/31) EU/EEA countries and the UK had reopened their primary schools and preschools at least partially, although in many settings, school summer holidays were still ongoing.

Four Member States (Estonia, Finland, Iceland and Sweden) never closed preschools and only two never closed primary schools (Iceland and Sweden) (Annex 1).

**Figure 1. Total number of EU/EEA countries and the UK (N=31) that enacted some form of school closure during the pandemic<sup>1</sup>**



<sup>1</sup>Totals are the sum of countries that had any form of school closure or restrictions in place at each specific point in time, including those with only partial closures in place.

Approaches to school closures have varied in most Member States with some schools enacting partial measures. Various policy approaches have been deployed that can be termed as 'partial closure', particularly during the recent phases of the pandemic when many countries were reducing societal intervention and reopening schools. 'Partial' measures taken include restricting class sizes, opening schools only for specific age/year groups, organising lessons with staggered timetables or alternating student cohorts between remote and in-school teaching [8].

A number of other non-pharmaceutical interventions (NPI) have been used as measures to reduce the risk of SARS-CoV-2 transmission in school settings where schools have been open, with the aim of decreasing the number of people in the school building, and/or decreasing the probability of infectious cases participating in school activities. These measures include basic advice to maximise physical distancing (supported by partial school closures in many cases), and encouragement/regulations for sick students, teachers and staff to stay home. Some countries in which schools had been closed also prepared detailed plans and guidance for their re-opening, Belgium and the United Kingdom being two such examples. A summary of NPI approaches used, including specific examples of action taken by individual Member States, is presented in Annex 2.

Under the European legislative framework on occupational safety and health (OSH), employers have an obligation to develop a prevention policy and ensure a safe and healthy workplace [10]. Many national and international organisations have published guidance on the organisation of schools to address risks from COVID-19, including WHO and several EU/EEA Member States and the UK. Examples are listed in Annex 3. In addition, the European Agency for Safety and Health at Work (EU-OSHA) has compiled guidance documents from different countries on COVID-19 and the educational sector [11].

The effect of school closures on the transmission of SARS-CoV-2 in the EU/EEA/UK and globally is largely unknown, but the effect of school closures on children's health and well-being has been well-documented and researched over the years, following influenza pandemics and school closures during the summer months.

## Impact of school closures on the health and well-being of children

A number of organisations have identified various negative impacts on children's wellbeing, learning opportunities and safety caused by school closures [12-14]. These range from the interruption of learning and the exacerbation of disparities and mental health issues to an increased risk of domestic violence. The negative impacts particularly affect children from vulnerable and marginalised population groups.

A report from the European Network of Ombudspersons for Children (ENOC) and the United Nations International Children's Fund (UNICEF) [13] indicates that children living in precarious conditions, and/or from ethnic minorities have faced more difficulties with distance learning, both due to digital poverty and difficulties for parents being able to assist in the learning process.

The United Nations Educational, Scientific and Cultural Organisation (UNESCO) [14] highlights that when schools close, children and youth are deprived of opportunities for growth and development. These disadvantages are disproportionate for under-privileged learners who tend to have fewer educational opportunities beyond school. Furthermore, economic circumstances can jeopardise the return to school for children and young people who are under pressure to work and generate income for financially distressed families.

Other health aspects, both physical and mental, also need consideration. For many students living in poverty, schools are not only a place for learning, but also for healthy eating, and therefore researchers warn that school closures will exacerbate food insecurity [15]. Research has highlighted that the active social life that children aged 2–10 years have at school helps them to learn from peers and has a positive impact on their personality and sense of identity, while disruptions of close peer relationships have been associated with depression, guilt, and anger in children [16]. Furthermore, school and extracurricular activities provide structure, meaning and a daily rhythm for children and youth. For those suffering from anxiety and depression, the loss of such activities can worsen symptoms and reinforce social withdrawal and feelings of hopelessness [17].

The report from ENOC and UNICEF also highlights other consequences of school closures [13]. Children with disabilities may be particularly affected as they can feel more isolated when schools and special services are closed and they have limited possibilities for digital communication. In addition, more time spent online increases the risk of cyber-bullying.

Furthermore, children are at increased risk of domestic violence during periods of school closure associated with health emergencies [18]. With schools closed, children no longer have a safety net that can detect and report child abuse, as well as an external social network and the support for coping with abuse at home. Beyond short-term effects, child-abuse and neglect have long-term effects, including mental health disorders, sexually transmitted infections, unwanted pregnancies, and substance abuse [19].

## Methodological approach

This technical report provides an overview of the epidemiology and disease characteristics of COVID-19 among children, and an assessment of the role of childcare school settings in COVID-19 transmission.

To address the epidemiology and disease characteristics of COVID-19 in children, a summary of evidence was produced, based on analysis of data from two different sources:

- Case-based epidemiological data from The European Surveillance System (TESSy);
- Data from the scientific literature that focuses on disease characteristics of COVID-19 with a focus on the population aged 18 years or younger. Searches were conducted to collect and to provide an overview of the latest available evidence on COVID-19 disease background in children, covering the following aspects: symptoms, severity, complications, viral shedding, infection, transmission, immune response and immunity.

To address the possible role of school settings in driving community transmission, information was gathered from literature searches and a survey with follow-up calls.

### 1. Literature searches

These took the form of daily literature searches conducted by ECDC to collect the latest available publications on COVID-19. The ECDC COVID-19 EndNote reference library contains more than 40 000 records and is updated and maintained by the ECDC Library. The EndNote library is updated daily, with results of a saved search designed to retrieve all new publications related to COVID-19 in PubMed, which is complemented by the monitoring of journal websites, COVID-19 specific publishers' portals for new publications and preprint portals for upcoming publications.

A more detailed description of the search is described in Annex 4. Articles were screened for relevance to school settings specifically and were included or excluded based on the criteria described in Annex 4. Additional articles were considered for relevance if they were published while the review was ongoing, so that the latest evidence could be included. The search was performed on 30 June 2020 and in total, 59 articles were retrieved.

## 2. Survey and follow-up calls

A two-question survey was distributed by email in July 2020 to the 31 ECDC Operational Contact Points for Influenza and COVID-19, as well as the countries' National Focal Points (NFPs) for Influenza, NFP for Surveillance, NFPs for Preparedness and Response and the National Coordinators. The questions were:

- Have there been any outbreaks of COVID-19 in educational settings in your country?  
If yes, have you undertaken any investigations in relation to these outbreaks?
- Do you have any indications of transmission from children to adults in educational settings or in general (e.g. from household studies or contact tracing)?

Follow-up phone calls were arranged with a subset of the responding countries to provide further clarifications and informal discussions individual country experiences.

The draft report was circulated to all EU/EEA countries and the UK in order to provide the opportunity to validate country data and its interpretation.

# Results

## Epidemiology and disease characteristics of COVID-19 in children

As of 26 July 2020, children made up a very small proportion of the 744 448 cases reported to TESSy as case-based data in the EU/EEA and in the UK; 31 380 (4%) were children aged under 18 years. Of these, 7 044 (24% of children) were below five years of age, 9 645 (32%) between five and 11 years and 13 020 (44%) between 12 and 18 years.

The age distribution of cases observed in the EU/EEA and the UK reflects testing policies and case definitions, which usually include the presence of symptoms. It is possible that the small proportion of cases reported among children reflects a lower risk of children developing COVID-19 symptoms or the fact that children are generally not prioritised for testing as they commonly experience milder symptoms. There might also be a lower tolerability/acceptance for testing children, given the invasiveness of nasopharyngeal swabbing.

Pooled and country-specific TESSy data are available in an online report series, published weekly on the ECDC website: <https://covid19-surveillance-report.ecdc.europa.eu/>.

## Common signs and symptoms in children

COVID-19, like SARS and MERS, is observed less frequently in children, who tend to present milder symptoms and have a better overall outcome than adults [20-24]. The most commonly reported symptoms in children are fever and cough [21,22,25]. Other symptoms include gastrointestinal symptoms, sore throat/pharyngitis, shortness of breath, myalgia, rhinorrhoea/nasal congestion and headache, with varying prevalence among different studies [21,22,25,26].

In a cohort of 582 paediatric cases of SARS-CoV-2 infection from 21 European countries, signs and symptoms upon presentation at healthcare institutions included fever (pyrexia) (65%), upper respiratory tract infection (54%), headache (28%), lower respiratory tract infection (25%) and gastrointestinal symptoms (22%) [27]. Correspondingly, studies from Italy [4,5,28,29], Germany [30], UK [31], Turkey [32] and Sweden [33] described similar symptoms and reported fever and cough as the most commonly observed symptoms. Gastrointestinal symptoms were more prevalent in children with severe COVID-19 than in those with mild disease [34].

Asymptomatic infection in children has been described in several large case series from China, which reported 4% to 28% asymptomatic paediatric cases among cases tested based on symptoms, signs or contact tracing [35,36]. A recent systematic review presenting data on 2 914 paediatric patients with COVID-19 from China, Spain, Iran, the Republic of Korea and the United States identified 14.9% asymptomatic cases in children [22]. Others have reported 18% asymptomatic cases in a meta-analysis of 551 laboratory-confirmed cases in children [37] and 16% asymptomatic cases among a European cohort of 582 children [27]. Similar observations were made for infants and neonates, 16% of whom were asymptomatic in a review of 160 infants with confirmed COVID-19 [25].

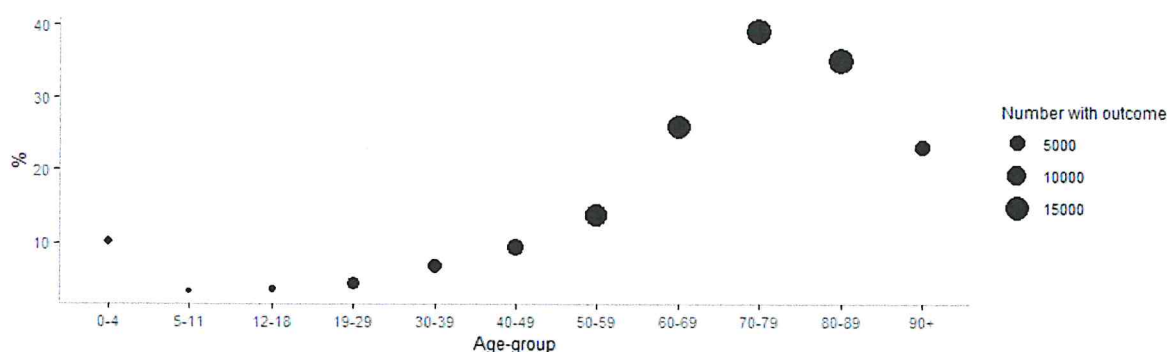
One explanation for why children might have milder symptoms of COVID-19 than adults is that children have a much more effective innate immune response than adults or elderly people. The observation of virus transmission by asymptomatic cases is strengthening the scientific evidence that the highly effective innate immune response against viruses, such as in children, provides a sufficient suppression of virus replication to prevent the development of COVID-19 specific symptoms [38].

Another explanation for milder symptoms in children is the possibility of cross-immunity against SARS-CoV-2 developed through previous seasonal coronavirus infection. The evidence regarding cross-immunity from prior seasonal coronavirus infection and anti-SARS-CoV-2 antibody levels is conflicting [39,40].

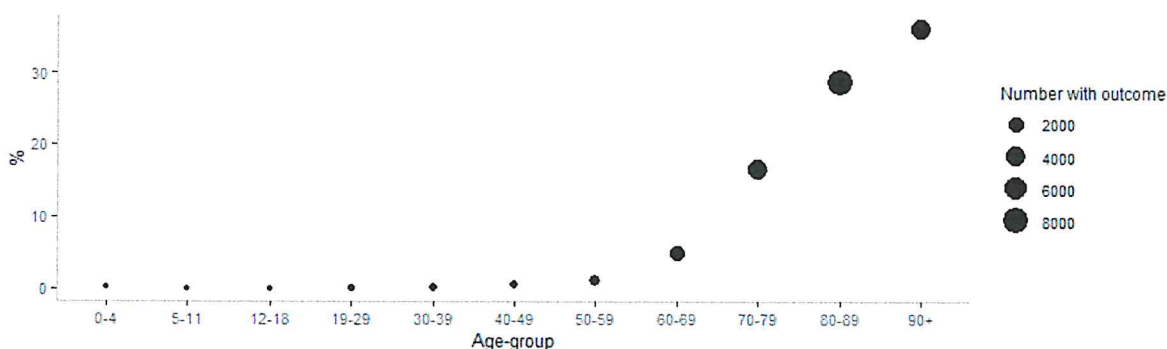
## Severity and complications

Among children reported by EU/EEA countries and the UK to TESSy, the proportion of cases hospitalised were lowest in the age groups 5–11 years and 12–18 years (3% and 4% respectively) and highest among 0–4 year olds (10%). Among adults, the proportion of hospitalised cases increased with age and was highest among 70–79 and 80–89 year olds (39% and 35% respectively) (Figure 2a). Deaths among cases under 18 years were extremely uncommon; only six out of a total of 19 654 (0.03%) deaths reported in TESSy were among children (for countries reporting complete data on outcome). This corresponds to a crude case-fatality of 0.03% among those aged under 19 years, compared to 5.8% among those aged 18 years and above, driven largely by deaths in cases aged 60 years and above, where case-fatality rates increase to 36% among those aged 90 years or above (Figure 2b). In weekly monitoring of all-cause mortality in 24 participating European countries or regions, mortality among 0–14 year olds has not exceeded background rates, in stark contrast to the significant excess mortality among the older adult age groups [41].

**Figure 2a. Proportion of hospitalised COVID-19 cases by age group, TESSy, EU/EEA and UK, 26 July 2020**



**Figure 2b. Crude case fatality rate by age group among all notified COVID-19 cases, TESSy, EU/EEA and UK, 26 July 2020**



Severe or critical illness has been reported among 2.5% to 5% of paediatric cases from China [35,42], and more recently, 4% of cases were reportedly as severe or critical in a systematic review [43] and meta-analysis [21] of 4 857 and 2 855 children, respectively. Infants and neonates were described as more vulnerable to severe COVID-19 than other paediatric groups in recent literature reviews [22,25,44], although in most cases a low mortality rate (0.006%) with favourable outcomes was reported for this group [25,27].

Pre-existing medical conditions have been suggested as a risk factor for severe disease and ICU admission in children and adolescents [26,27].

Several countries affected by the COVID-19 pandemic reported cases of children who were hospitalised in intensive care units due to a rare paediatric inflammatory multisystem syndrome (PIMS) or multisystem inflammatory syndrome in children (MIS-C) [45-47], characterised by a systemic disease involving persistent fever, inflammation and organ dysfunction following exposure to SARS-CoV-2 [48-50]. For further information on PIMS in SARS-CoV-2

patients, please refer to the ECDC rapid risk assessment [51]. Paediatric patients have also been reported with cardiovascular involvement [52-55], namely myocarditis, as well as with renal dysfunction [56,57].

## Viral shedding of SARS-CoV-2 among children

The detection of viral RNA by PCR does not directly indicate infectivity. Nevertheless, the detection of viral RNA and the measure of viral load are potentially useful markers for infectiousness, as well as for assessing disease severity and prognosis. Overall for COVID-19 patients, SARS-CoV-2 viral RNA has been detected in most bodily fluids including blood [58-60], saliva [58,59], nasopharyngeal specimens [61], urine [62], and in stool [63,64]. Based on the limited case data, shedding of viral RNA through the upper respiratory tract may be of shorter duration in children than adults. In contrast, children show prolonged viral shedding via the gastrointestinal route after clearing the virus from the respiratory tract [65]. Further, a recent study suggests that the viral load in children under five years with mild to moderate COVID-19 symptoms is higher than in older children and adults [66].

There does not appear to be a significant difference in viral RNA load between symptomatic children and symptomatic adults, indicating that children shed viral RNA (whether viable or not) in a similar manner to adults [67]. This does not, however, indicate whether children transmit the infection to an equal extent, given that the exact load of viable virus is unknown and that it will depend on the specimen from which the virus is identified (e.g. upper respiratory tract versus gastrointestinal). Children have been shown to develop neutralising antibodies after SARS-CoV-2 infection [68].

## Infectiousness of children in household settings

In a manuscript (as yet not peer reviewed) relating to contact tracing efforts carried out during school closures in Trento, Italy, the attack rate among contacts of 0–14 year old cases was 22.4%, which is higher than that of working-age adults (approximately 13.1%) [69]. In this study, not all asymptomatic contacts were tested. South Korea has permissive testing recommendations for contacts identified during contact tracing, meaning that more secondary cases are identified among children than in other settings. The attack rate among household contacts of index cases aged 0–9 years and 10–19 years was 5.3% and 18.6%, respectively, indicating transmission potential in both children and adolescents, and possibly more effective transmission in adolescents than in adults [70]. These results, consistent with unpublished data from EU/EEA and UK contact tracing efforts, support the transmission potential of children, in household settings.

## Seroprevalence of COVID-19 antibodies among children

Seroprevalence studies aim to determine the proportion of population groups that have detectable antibodies against SARS-CoV-2, in order to provide an indication of how many people have been infected with the virus. A number of seroprevalence studies have been undertaken in the EU/EEA region, while others are still ongoing. Table 1 summarises preliminary results found in literature searches or on countries' official websites. All studies were conducted after the peak of the first wave at various points in time, depending on national response measures (before, during or after lockdown).

**Table 1. Descriptions and results of sero-epidemiological studies including children in EU/EEA Member States and Switzerland from public sources, as of 24 July 2020**

Country	Number (n)	Type of study	Age group	Time of sampling (in 2020)	Timing	Laboratory method	Proportion of positive samples (%)
<b>Seroprevalence studies designed for children and adolescent populations</b>							
<b>France (Paris area)* [71]</b>	605 children	Prospective cross sectional multi-centre ambulatory paediatric clinics	0-15 years	14 April-12 May	After peak of first wave - during lockdown	Biosynex COVID-19 BSS test IgG/IgM	10.7
<b>Germany (Baden-Württemberg)* [72]</b>	2 466 children	Cross sectional private diagnostic labs – 2 collections	0-20 years	30 March - end April	During lockdown	Euroimmun IgG	5
<b>France (Oise)* [73]</b>	242 students	Retrospective closed cohort in high school	14-17 years	30 March-4 April	After school outbreak - during lockdown	Multiple assays	10.2
<b>Germany (Saxony)* [74]</b>	1 538 students	Cross sectional in 13 Schools of the region	14-17 years	25 May-30 June	After peak of first wave - after lockdown	Diasorin LIAISON, CMIA and Abbott	0.7
<b>General population seroprevalence studies</b>							
<b>Spain [75]</b>	6 527 children	Nationwide population based household random sampling – 2 collections	Household Focus: 0-19 years	27 April – 11 May	After peak of first wave – during lockdown	POC (Orient Gene Biotech COVID-19 IgG/IgM) & Immunoassay (Abbott Laboratories)	3.4- 3.8
<b>Spain (Barcelona) [76]</b>	Overall sampling 311 individuals	Random age stratified population (asymptomatic children)	0-14 and 15-29 years	21 April - 24 April	After peak of first wave - During lockdown	Rapid lateral flow immunoassay IgG/IgM	0 and 10
<b>Switzerland (Geneva) [77]</b>	214 children	Repeated population based household sampling	5-19 years	Three weekly samplings in April	After peak of first wave	Euroimmun IgG	6.1
<b>Belgium [78]</b>	N/A	National prospective cross sectional residual sera from private diagnostic labs – 2 collections	0-20 years	30 March – end April	During lockdown	Euroimmun IgG	5
<b>Germany (Gangelt) [79]</b>	405 households	Random sample household study	5 years-14 years and 15-34 years	30 March – 7 April	After peak of first wave - before lockdown	Euroimmun IgG	9.1 and 15.4

Country	Number (n)	Type of study	Age group	Time of sampling (in 2020)	Timing	Laboratory method	Proportion of positive samples (%)
<b>Germany (Neustadt-am-Rennsteig) [80]</b>	58 children	Population-based cohort – household sampling	Children-adolescents	12-22 May	After peak of first wave -after lockdown	Combination of ELISA and CLIA/CMIA tests	1.7
<b>Netherlands [81]</b>	Overall sampling 2 096 individuals	Nationwide random population sample	0-19 years	31 March - 13 April	During lockdown	NA	1–2%
<b>Sweden (multiple regions) [7]</b>	1 600 children	Residual sera from outpatients presenting for non-COVID related consultation	0-19 years	weeks 18-21	No lockdown	Bead-based multiplex serology assay	4.7–7.5

Two studies, conducted by France and Germany [71-74] had a special focus on children (0–10 years) and two on adolescents (14–17 years) in school settings. Both studies in France found a prevalence of SARS-CoV-2 antibodies of around 10%, whereas in Germany the results were <1% among the younger population.

A number of SARS-CoV-2 seroprevalence studies have been conducted in the general population. The methodology used in these studies was mainly a random household sampling, while others used convenience samples (e.g. leftover sera). When extrapolating seroprevalence results for the young age group (0–18 years), the actual denominators for this population were not always shown in detail, or included very small sample sizes. This is a limitation for the current synthesis and interpretation.

As described above, the seroprevalence results in the general population within the EU/EEA region vary from 0–10%. Although the sampling time-frames differ among the countries performing the studies (in relation to local lockdowns), the extent of mitigation measures deployed does not seem to significantly affect the level of seroprevalence in the young population. Results from Sweden, which did not close schools or enforce mandatory lockdown measures, show a presence of 4.7–7.5% of SARS-CoV-2 antibodies among the young population over a period of four weeks, which is comparable to seropositivity among adults [7].

In general, the majority of countries report slightly lower seroprevalence in children than in adult groups (20–55 years), however these differences are small and uncertain. The lower seroprevalence in children can be an indication that children are less susceptible to infection and/or less frequently infected than adults, and therefore play a less significant role in the spread of the virus [81]. A population seroprevalence study in Geneva [77] estimated that in young children aged 5–9 years the risk of being seropositive was lower (RR 0.32 (CI 0.11–0.63)) than in those aged 20–49 years.

A study from Paris, including a relatively large number of children (>600), combined RT-PCR SARS-CoV-2 and serology results to assess the spread of SARS-CoV-2 infection (i.e. the study captures both people with ongoing viral infection and those with antibodies from past exposure to the virus). Less than 2% were positive for RT-PCR for SARS-CoV-2, while seropositivity was much higher (10.7%). No significant difference was seen in the proportion of positive RT-PCR or serology results between asymptomatic and pauci-symptomatic children. However, asymptomatic children with no history of symptoms during the preceding weeks accounted for two thirds of children with positive serology results (28/41). This supports the hypothesis that asymptomatic infections are more frequent in the young than in older age groups.

In summary, cross-sectional epidemiological studies show a tendency towards lower proportions of antibodies among children and adolescents than in adults. The study done in Sweden did not show a difference between those under 19 years and working-age adults. More specialised studies need to be performed, with a focus on this population to better understand infection as well as antibody dynamics.

## Evidence relating to the role of childcare and school settings in COVID-19 transmission

Evidence related to the role of childcare and school settings in COVID-19 transmission between children and adults relies on detection of potential cases or clusters, followed by extensive contact tracing and follow-up to determine if any close contacts develop symptoms and test positive for SARS-CoV-2 within the 14-day incubation period. In the following sections, evidence is provided from Member State reports to a country survey and from scientific literature.

### Overview of outbreaks and transmission in childcare school settings: experiences from Member States

Of 31 EU/EEA and UK countries, 15<sup>1</sup> replied to the survey. To gather more detailed information and clarification of their replies, five countries<sup>2</sup> were invited to participate in a follow-up phone call.

Of the 15 countries responding to the survey, six countries specifically reported having identified COVID-19 outbreaks in school settings and nine countries reported not having identified any outbreaks. Of the nine countries not having observed outbreaks in educational facilities, four countries specified not having seen any cases at all and the remaining five reported that individual cases in pupils and/or adults had been identified, but with no evidence of secondary transmission. The fact that four of the countries had not seen any cases may partly be linked to their schools having been closed early in the pandemic.

The six countries reporting that clusters had been identified in educational settings all said that these were limited in number; only involving a few secondary cases. Only one country reported a cluster of more than 10 cases (13 confirmed, four students and nine staff), however this event was seen as an exception rather than the norm.

Ten countries replied that they did not have strong indications of children-to-adult transmission, whether in schools (all 10 countries) or in other settings (six of these 10 countries). One country reported knowledge of a single event in which one child transmitted the infection to both parents. The remaining four countries said that they could not give a specific reply to the question.

The above findings were expanded on through follow-up calls with five countries. Only one of the five countries described one or two events in which secondary transmission had been identified in a school setting.

Several of the countries with whom follow-up was arranged said that their schools had, at some point during the peak of their outbreaks, been closed as a mitigation measure, and recognised this in itself could be an explanation as to why school outbreaks had not occurred. However, these countries highlighted the fact that, up until their schools were closed (and if their schools re-opened before the summer break), outbreaks in schools had still not been observed or identified.

Two of the five countries further explained that there were challenges in achieving adequate capacity for contact tracing and outbreak investigation at some point during their epidemic peak and, therefore, perhaps not all outbreaks were identified and/or traced. However, even taking this into account, they did not consider that many school outbreaks would have been missed since their national surveillance systems would have been sensitive enough to have picked up any signals indicating that children and schools were substantially affected.

In summary, clusters in educational facilities were identified in several of the 15 reporting countries, however those that occurred were limited in number and size, and were rather exceptional events. Several countries specifically said that they had no indication that school settings played a significant role in the transmission of COVID-19. Secondary transmission in schools, either from child-to-child or from child-to-adult, was perceived to be rare. Countries where schools had re-opened by the time of the survey stated that they had not seen an increase in cases in these settings. Responses from the countries suggest that, so far, schools have not been a major outbreak environment for COVID-19 in the EU/EEA and UK.

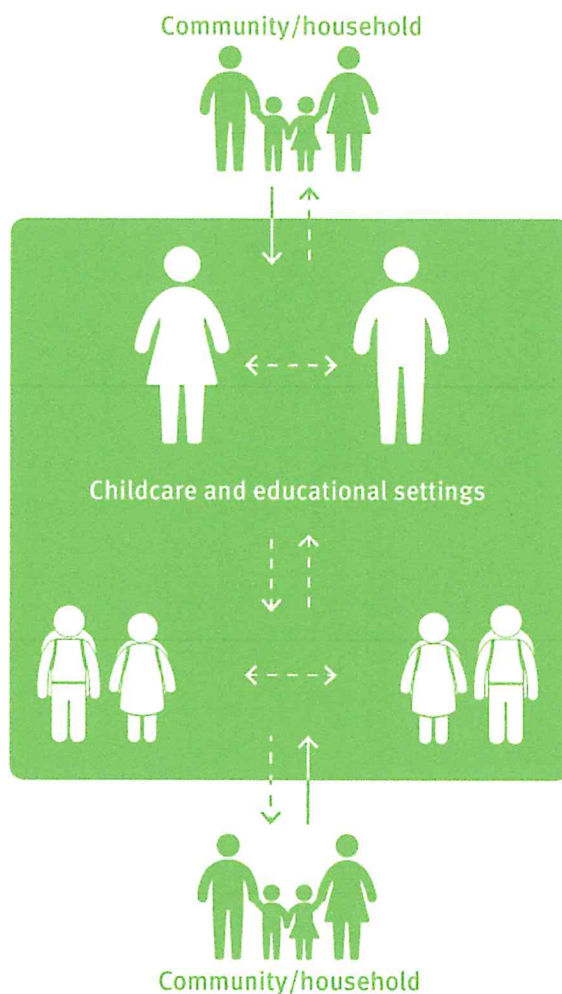
### Overview of outbreaks and transmission in school settings: evidence from the literature

One overall limitation of surveillance and contact tracing studies is that surveillance is often symptom-based, thereby often omitting possible asymptomatic cases in children. To supplement surveillance and outbreak study data provided by countries, ECDC performed a literature review (see Methods) to assess the evidence for SARS-CoV-2 transmission between different actors in the school setting and the evidence for school closures on overall COVID-19 transmission (Figure 3).

<sup>1</sup> Cyprus, Denmark, Finland, France, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Romania, Spain, Sweden, and the United Kingdom

<sup>2</sup> Denmark, Ireland, Luxembourg, Sweden, United Kingdom

**Figure 3. Diagram of known transmission routes between children and adults within childcare and educational settings and between the community/household**



*Note: solid arrows represent routes of transmission where there is strong evidence for transmission, dashed lines represent routes of transmission where there is variable or mixed evidence of transmission between individuals within the childcare and school settings and to the community/household outside of educational settings.*

### **What is the evidence of transmission between children within the school setting?**

Available evidence appears to suggest that transmission among children in schools is less efficient for SARS-CoV-2 than for other respiratory viruses such as influenza [82]. However, this evidence is mainly derived from school outbreaks which tend to rely on detecting symptomatic cases only and will therefore underestimate the number of infected, asymptomatic, and potentially infectious children in these outbreaks.

In France, a carefully documented study identified an infected child (age nine years) who had interactions with a large number of contacts in three different schools and did not transmit the disease, as evidenced by the large number of negative results of tested symptomatic and asymptomatic contacts [83].

In Ireland, transmission within schools was investigated prior to school closures and no evidence of secondary transmission within the school setting was found. Among the 924 child contacts and 101 adult contacts of the six cases (three children, three adults) in the school setting, there were no confirmed cases identified during the 14-day follow-up period [84]. It is important to note that this study did not consider asymptomatic infections.

In Finland, no secondary cases were identified in contact tracing and testing of 89 out of 121 contacts of a 12-year case who had attended school during their illness [85].

In Australia, a contact tracing study in 15 primary and high schools, where nine student COVID-19 cases were detected, found one secondary positive case in a primary school student (out of 735 close child contacts who were followed up) [86].

In Singapore, two preschools and one secondary school identified child index cases and tested close contacts. In a case where a preschool child was the index case (mean age 4.9 years), 34 preschool student contacts developed

potential COVID-19 symptoms during the incubation period, however all 34 symptomatic cases tested negative for SARS-CoV-2. In a case where the index child was in secondary school (mean age 12.8 years), a total of eight out of 77 students developed symptoms and were screened for SARS-CoV-2 during the incubation period. All eight symptomatic student contacts from the school tested negative [87,88].

In Israel, a first large school outbreak emerged ten days after re-opening all schools with requirement for daily health reports, hygiene, face masks, social distancing and minimal interaction between classes. The first two cases were registered on 26 May and 27 May, having no epidemiological link. Testing of the complete school community revealed 153 students (attack rate: 13.2%) and 25 staff members (attack rate: 16.6%) who were COVID-19 positive. Overall, some 260 persons were infected (students, staff members, relatives and friends) [88].

In summary, in children where COVID-19 was detected and contacts followed-up, only one child contact in the school setting was detected as SARS-CoV-2 positive during the follow-up period. The conclusion from these investigations is that child-to-child transmission in schools is uncommon and not the primary cause of SARS-CoV-2 infection of children whose infection onset coincides with the period during which they are attending school.

### ***What is the evidence of transmission from children (students) to adults (teacher/staff) within the school setting?***

In an Irish study, 101 adult contacts in the school setting of three SARS-CoV-2 positive children resulted in no additional cases [84]. It is important to note that this study did not consider asymptomatic infections.

In Australia, a contact tracing study in 15 primary and high schools where nine student COVID-19 cases were detected found no evidence of any transmission to 128 adult close contacts in the school setting [86].

In the Netherlands, as of June 2020, there had been no reports of possible COVID-19 clusters linked to schools or reports of employees infected by children [81].

In summary, where COVID-19 in children was detected and contacts followed-up, no adult contacts in the school setting have been detected as SARS-CoV-2 positive during the follow-up period. The conclusion from these investigations is that children are not the primary drivers of SARS-CoV-2 transmission to adults in the school setting.

### ***What is the evidence of transmission from adults (teacher/staff) to children (students) within the school setting?***

There is very little documented evidence of potential transmission from adults to children within the school setting. In Ireland, three adult cases had a total of 102 child contacts that did not result in detection of any secondary child cases although, only symptomatic individuals were referred for follow-up testing [84]. The outbreak in a high school in Israel did not specify the age of the index cases, making identification of adult-to-student transmission within the school setting impossible without further information [88].

In Australia, a contact tracing study in 15 primary and high schools where nine staff-member-COVID-19 cases were detected found one secondary positive case in a secondary school student (among 735 child close contacts who were followed up) [86].

In Finland, following exposure to an infected teacher, seven out of 42 exposed students developed antibodies or were PCR positive, however household or community transmission may have been the source in some of these [85].

There is ample evidence that if a child is infected by an adult, it is likely to be in the household setting. In an Italian cohort, contact with an infected person outside of the family was rarely reported and 67% of children had at least one parent who tested positive for SARS-CoV-2 infection [4,5]. It is also important to note that interactions between children and adults are different in the school setting to those in the household setting.

In summary, while there is evidence of transmission from adults to children in household settings, there is little evidence of this occurring within the school setting.

### ***What is the evidence of transmission between adults (teacher/staff) within the school setting?***

There is limited evidence within the peer-reviewed literature documenting transmission between adults within the school setting. In Sweden, where schools for children younger than 16 years remained open, the Public Health Authority analysed occupational groups within the school and found that teachers were at no higher risk of COVID-19 than the general public. Relative risks were: preschool teachers (0.7), compulsory school teachers (1.1), senior high school teachers (0.7), recreation staff (0.8), student assistants (1.1), other educators (1.0), and childcare providers (1.0) [9]. Recommendations for Swedish schools were that everyone with mild symptoms remain at home, to practise physical distancing, to cancel mass gatherings within the school setting, and to practise hand hygiene while in the school setting. See Box 1 for more information on the Swedish approach.

A study documenting an apparent school outbreak of 50 people in Chile describes an index case, a teacher, participating in multiple parent conferences about five days prior to the peak of the outbreak [89]. However, the

designation of the index case is based on testing as a result of symptoms and might therefore have missed asymptomatic children. Serology results 8–10 weeks after the outbreak suggest comparable levels of infections among children and adults at the school, but these infections might have occurred outside of the school setting, as the school in question was closed down rapidly after the index case was detected.

The conclusion from these investigations is that adults are not at higher risk of SARS-CoV-2 within the school setting than the risk in the community or household.

### *What is the effect of school openings on transmission to the community/household?*

While there is a growing body of evidence to suggest that transmission between children and between children and adults within schools has been relatively uncommon, there have been very few studies that have assessed the impact of school closure or opening on transmission outside the school. Among those that have been published, the following have suggested that schools closure or opening could impact on community incidence:

A recently published study on the association between school closures and community incidence in the USA [90] has suggested that school closures could have been associated with up to 128.7 fewer cases per 100 000 population over 26 days and with up to 1.5 fewer deaths per 100 000 population over 16 days in areas with low starting incidence. However, these closures occurred at the time of the introduction of many other non-pharmaceutical interventions, and the authors note that it was "impossible to fully isolate potential effects of school closure", and that "some non-pharmaceutical interventions, such as increased handwashing, could not be included due to lack of available data." The authors also note that "The degree to which the associations with school closure relate to decreased spread of SARS-CoV-2 by children or a combination of child and adult factors is unclear."

In Israel, a first large school outbreak emerged ten days after re-opening all schools with requirement for daily health reports, hygiene, face masks, social distancing and minimal interaction between classes [88]. The author's report that 87 additional confirmed COVID-19 cases occurred among close contacts of the first school's cases, including siblings attending other schools, friends and participants in sports and dancing afternoon classes, students' parents and family members of school staff. However, the authors do not comment on the likely sequence of infection in these cases, and also note that distancing among students and between students and teachers within the school was not possible. Moreover, as a consequence of a heatwave that occurred at the time of re-opening, there was an exemption from the use of facemasks, and air-conditioning functioned continuously in all classes.

Much of the other evidence that exists on the impact, or the lack thereof, of school opening and closures on community transmission derives from observational studies and a survey undertaken by ECDC of contact points in national public health institutes in EU Member States.

Denmark reopened childcare and primary education on 15 April, with moderately high overall notification rates at national level, and did not report any increase in the reproductive number, or detect important school outbreaks. Denmark recommended splitting classes into smaller groups, keeping two metres between children, hand hygiene, and teaching more classes outside. Similarly, the Netherlands did not see a sudden increase in their reproductive number or detect significant outbreaks, when primary schools and childcare facilities opened on 11 May, with moderately high notification rates at national level. Children up to and including 12 years did not have to keep 1.5 metres apart from each other or from adults, and this measure was applied in childcare and primary education settings. Children aged 13 to 18 years did not have to physically distance from one another. Physical distancing was recommended for all adults - staying 1.5 metres apart from others as often as possible [81].

Since the beginning of the pandemic, 41% of Ireland's 576 cases in children were linked to outbreaks in private family homes, followed by outbreaks in workplaces (n=25; 18.1%), travel related outbreaks (n=19; 13.7%), outbreaks in residential institutions (n=12; 8.7%), extended family (n=11; 8.0%) and in the community (n=8; 5.8%). None of the COVID-19 cases have been linked to outbreaks in school or childcare facilities [personal communication Ireland].

Iceland also kept both childcare institutions and primary schools open throughout the spring term and the rates of SARS-CoV-2 in children <15 years remained low compared to rates in the older age groups. Physical distancing rules did not apply to childcare institutions and primary school children and they were not limited in their leisure, sports, or music activities. Access to hand-washing facilities and disinfection was mandatory and adults had to respect the two-metre distancing rules and not gather in groups over 200 [91]. Similarly, in Sweden, the 14-day incidence for children <15 years has remained lower than all of the other age groups, even when Sweden expanded their testing policy to include mild cases (see Box 1 for further details) [6].

In summary, there is limited evidence that schools are driving transmission of COVID-19 within the community, however there are indications that community transmission is imported into or reflected in the school setting. Given that all countries have implemented additional non-pharmaceutical interventions in addition to school closures, it is difficult to assess the true impact of school closure/opening on transmission of SARS-CoV-2 within the community from the school setting itself. The report from Israel underscores the importance of the rigorous implementation of physical distancing in order to reduce exposure in school settings where COVID-19 is circulating in the community.

## Box 1 – Sweden

### Keeping preschools and primary schools open

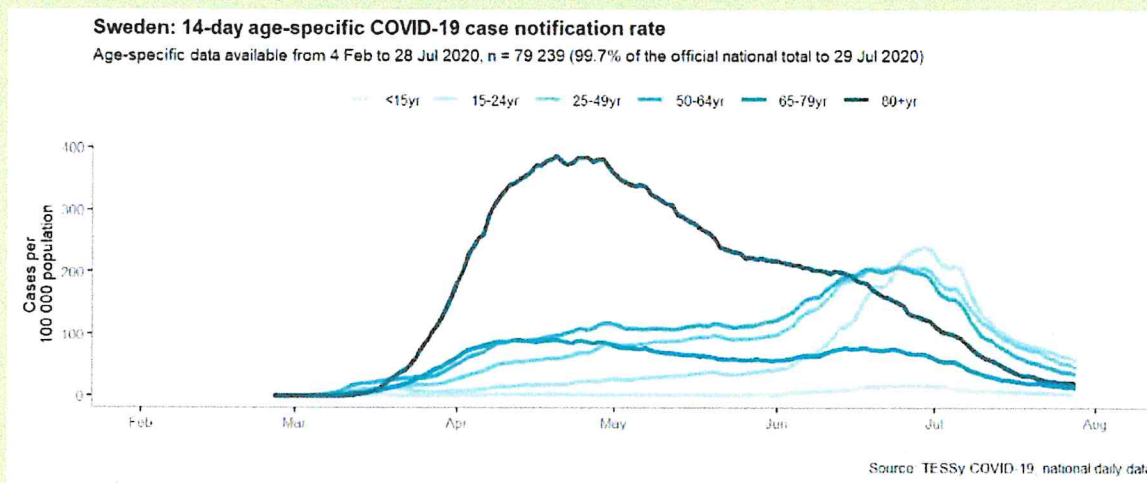
Throughout the pandemic, Sweden's decision to keep preschools and primary schools open for children under 16 years gained worldwide attention when most other countries decided to close educational establishments for all in-person schooling. The country reports that the overall incidence is continuing to decrease, with an incidence of 22 per 100 000 inhabitants for week 29, and that regional differences in incidence and severity of cases continue to exist [1].

In contrast to other EU/EEA Member States, Sweden actively kept preschool and primary schools (0–15 years of age) open during the school spring term with the condition that other measures - such as physical distancing, hand hygiene, and staying home with mild symptoms - were introduced to reduce the risk of infection. Authorities explained that the decision was based on an assessment of the epidemiological situation, available evidence on the role of children and school settings in community transmission, and the need to consider the additional health impacts of school closures on children [2]. High schools (for those aged 16–19 years) were closed and distance learning was provided as it was considered that older age groups were more independent and could manage distance learning. Furthermore, high schools commonly cover a wider geographical area, and therefore it was considered that there was a higher perceived risk involved in transportation to and from school.

In a recent report, Sweden described children being affected to a lesser extent than other age groups; as of 28 May 2020, 0–9 year olds represented 0.5% of all cases and the age group 10–19 years represented 1.2% of all cases (total number of cases as of 28 May was 35 719). Furthermore, their data show that children represent a minor proportion of all intensive care COVID-19 cases; individual cases in the 0–9 year age group and 0.3% of all ICU cases in the age group 10–19 years) [2].

Sweden's weekly epidemiological report published on 24 July 2020 [1] and in ECDC's weekly country overview [6] shows an increase in positive cases in the 0–19 age group in weeks 22–26 as testing capacity expanded to include mild cases (Figure A). Repeated serosurveys analysing residual sera from non-COVID-19 primary care patient samples in nine counties of Sweden during weeks 18–21 do not show a significant difference in seropositivity rates among 0–19 year old children and working-age adults [7].

**Figure A. 14-day age-specific COVID-19 case notification rate**



On 29 May 2020, Swedish authorities updated their recommendations on schools and COVID-19, presenting and taking into consideration the latest epidemiological situation, updated a review of the scientific evidence on COVID-19, children and educational settings, and a review of scientific evidence on the impact of school closures on children's health [2]. The following considerations were summarised [2]:

- Children and young people represent a small proportion of the overall number of COVID-19 cases in the country;
- Most children are infected by adults and children often have mild symptoms, if any;
- Children are considered to transmit the disease to a lesser extent than adults;
- Schools have not been seen as a significant driver of (community) transmission;
- Teachers and staff were not identified as being at increased risk of contracting COVID-19 disease compared to other occupations [9];
- The closure of schools has other negative effects on children and young people.

As of 15 June 2020, Sweden recommends that all educational facilities remain open, and that these settings must continue to implement and abide by the national recommendations for preventing and decreasing the transmission of COVID-19 [2].

## Discussion

When infected and symptomatic, children appear to be able to shed the virus in similar quantities to adults, and children in households have transmitted SARS-CoV-2 to their contacts in similar proportions to adults. Less is known about the infectiousness of asymptomatic or pre-symptomatic children. The results from cross-sectional serology [86,87] and school outbreak studies, together with the low number of symptomatic and laboratory-confirmed children reported through surveillance and outbreak studies, are consistent with the majority of SARS-CoV-2 infected children being asymptomatic.

Serological studies indicate that similar, often smaller, proportions of children and adolescents than working-age adults are seropositive. However, interpretation of age-group differences in seropositivity rates is hampered by the small number of children included in many studies. Meaningful comparisons between seropositivity reported in different locations is difficult due to differences in the characteristics of the laboratory methodology used and timing of the studies in relation to the outbreak and response measures. Overall, however, there is compelling evidence that a far greater proportion of children with COVID-19 are asymptomatic than is seen among adults. Therefore, for children to have a significant potential for onward transmission, one needs to assume important asymptomatic or pre-symptomatic transmission.

The evidence available strongly suggests that transmission resulting in symptomatic infection of either children or adults is uncommon in schools. Interpretation of this evidence, and particularly extrapolation to the conclusion that transmission results in any form of infection (i.e. including asymptomatic or pauci-symptomatic infection), is hampered by the observation that asymptomatic infection is much more common in children than in adults. As such, case finding and surveillance that is based on the testing of symptomatic individuals may miss many childhood infections.

The observation that adult staff working in schools appear not to have higher rates of COVID-19 infection than other occupational groups, the relative lack of evidence of child-to-adult transmission in schools where child cases have been identified, and the evidence (albeit limited) that the re-opening of schools in EU countries has not been associated with significant increase in community transmission supports the conclusion that transmission within schools is not a major driver of COVID-19 incidence, if appropriate mitigation measures are applied within the schools and community. There is some countervailing evidence from Israel that re-opening schools might have an impact on overall rates of community transmission, but as the re-opening of schools coincided with the relaxation of other measures, the role of schools in the upsurge of COVID-19 is unclear.

In addition, an analysis of the probable origin for transmission of COVID-19 infection in outbreaks that have involved children in Ireland indicated that the most common setting was the home, followed by workplaces, travel and residential institutions, with none of the childhood cases linked to outbreaks in schools.

European public health authorities responding to our survey on school outbreaks reported very few clusters or outbreaks in schools, however the majority of countries experienced peak transmission waves during school closures, so exposure opportunities have been limited. From the literature, there are limited case reports of outbreaks in schools, which perhaps reflect the fact that such outbreaks have occurred relatively infrequently to date. Available study results are also somewhat inconsistent; contact tracing of the index cases behind outbreaks in Australia [86], France [83], and Ireland [84] identified very few positive cases among exposed individuals, while a recent report from Israel [88] suggests that up to 32% of cohort contacts in a high school setting were virus positive although, as noted above, these results should be interpreted with caution.

Overall, there is limited evidence from EU/EEA countries and the literature to indicate that schools are driving transmission within the community. However, there are indications that community transmission is imported into or reflected in the school setting. Given that all countries have implemented non-pharmaceutical interventions in addition to school closures, and that they have sometimes relaxed these when re-opening schools, it is difficult to assess the true impact of school closure and opening on transmission of SARS-CoV-2 within the community from the school setting itself. Since schools are an integral part of the communities they serve, results from outbreak studies in schools are difficult to disentangle from concurrent community outbreaks. However, the report from Israel underscores the importance of the rigorous implementation of physical distancing and exposure reduction in school settings where COVID-19 is circulating in the community.

As highlighted in the Swedish context and by a review of work carried out among vulnerable groups in the EU/EEA, there may be reasons beyond COVID-19 prevention, which may be of importance to policy makers when considering whether to close or open schools. These include physical and mental health concerns, educational attainment, and the ability of caregivers to fulfil employment obligations.

Based on available evidence, it is important that non-pharmaceutical measures in the community, such as physical distancing, cancellation of mass gatherings, hand hygiene and staying home if symptomatic, remain integral to preventing schools from becoming a setting for accelerating onward transmission. If these measures are in place in the community, and if infection control policies - including practising hand hygiene and staying at home for students and staff with symptoms - are also applied in schools themselves, the likelihood of COVID-19 transmission in the school setting is not higher than the likelihood in the community at-large.

## Limitations

This technical report is based on information and data available to ECDC at the time of publication.

- There is still limited epidemiological and clinical information on COVID-19 in children (e.g. efficiency of different modes of transmission, proportion of mild and asymptomatic cases, transmission during incubation and recovery period, effectiveness of treatment regimes, risk factors for severe illness other than age and effective preventive measures).
- Most case-based surveillance systems in the EU/EEA countries do not collect information that would allow public health authorities to identify outbreaks or clusters in specific schools without notification from the school itself.
- The majority of seroprevalence results among children and adolescent population presented in this report were extracted from general population-based studies, with a variety of sampling methodology used. Very often, denominators were not mentioned for this population, or involved very small numbers, making comparison and interpretation of results difficult.
- Results from serological studies are often not adjusted for test characteristics.
- Information on testing strategies in educational settings was not available.
- Many countries are not testing asymptomatic cases, so it is difficult to detect and understand transmission among mild or asymptomatic children and teachers.
- It is difficult to identify all potential routes of transmission within school settings as some activities have been limited (e.g. school sporting events, mixed mass gatherings of students and adults such as school concerts, performances, and graduations, etc.). The potential impact of allowing such events to take place within the school setting is still unknown.
- Interpretation of outcomes of school outbreak reports in the midst of ongoing community transmission is difficult.
- This report focuses on evidence for COVID-19, which remains limited. Not enough is known as yet to assess whether extrapolation of the evidence related to seasonal influenza transmission in schools and the impact of school closures would provide a valid basis for policy decisions. As such, this evidence has not been reviewed in the current document.

## Research needs

The role of children in COVID-19 transmission is yet to be fully elucidated and there is a need to determine the extent to which children are a) susceptible to SARS-CoV-2 virus across different age groups, and b) capable of transmitting infection to others when asymptomatic or symptomatic.

In terms of susceptibility, ongoing large-scale surveillance and seroprevalence studies will further inform the proportion of children infected compared to adults. Hence, it is important that children are represented in the sampling for these studies. Interpretation of surveillance would also benefit from improved understanding of the underlying immune response and antibody dynamics in children, including the ability of children to elicit a detectable immune response following both asymptomatic and symptomatic infection.

It is known that children are able to transmit infection to others, but the transmission dynamics and primary routes of transmission remain unclear. Evidence suggests that asymptomatic infection may be more prevalent in children than in adults, but further confirmatory research is needed, together with work to understand both the underlying biological mechanisms of this differential response to infection, and how that impacts the COVID-19 epidemiology. Improved understanding of pre-symptomatic and asymptomatic infection will determine the extent to which children play a role in onward transmission of SARS-CoV-2 to their peers and to adults in both school and community settings.

Specifically, in school settings, risk mitigation may benefit from operational research to understand and optimise approaches; this includes assessment of efficacy and compliance of IPC measures in school settings across age groups, such as physical distancing measures, mask wearing, etc. There would also be benefit in conducting formal assessments on the relative efficiency of high-level school-specific measures, such as restrictions in class sizes and access. Modelling work will probably provide valuable information on these issues in addition to broader societal impacts from COVID-based adjustment to school attendance, such as social mixing among children and changes to social interactions as a whole. At EU level, it may be beneficial to review specific measures used and to share best practices to inform approaches in the Member States.

## Conclusions

As countries perform their own risk assessments on whether schools should re-open after the summer break, this technical report provides a) the epidemiological situation and disease characteristics relating to COVID-19 among children (0–18 years) in EU/EEA countries and the United Kingdom (UK), and b) evidence of the role of childcare and school (preschool, primary and secondary schools) settings in COVID-19 transmission and of the secondary transmission of COVID-19 within childcare and other educational settings.

School outbreaks are not a prominent feature in the COVID-19 pandemic, which may at least partially be due to the fact that the majority of children do not develop symptoms when infected with SARS-CoV-2. Investigations of cases identified in school settings suggest that child-to-child transmission in schools is uncommon and not the primary cause of SARS-CoV-2 infection in children whose onset of infection coincides with the period during which they are attending school, in particular in preschools and primary schools. The only EU/EEA countries (Sweden and Iceland) that kept preschools or primary schools open with mitigation measures (e.g. hand hygiene, physical distancing, staying home when ill, etc.) during their epidemic did not report larger numbers of hospitalised cases among children, despite the overall outbreak being severe and prolonged in Sweden. EU/EEA countries that partially opened their schools before the summer break, often with community mitigation measures, have not experienced school outbreaks or major resurgences - in contrast to Israel, which experienced a significant second wave in July 2020 and has reported school outbreaks.

Closures of childcare and educational institutions are unlikely to be an effective single control measure for community transmission of COVID-19 and such closures would be unlikely to provide significant additional protection for the health of children, most of whom develop a very mild form of COVID-19 disease, if any. Therefore, any decisions on school closures should be made for the purpose of mitigating the impact of community epidemics and will need to be taken in the context of all other community mitigation measures. ECDC has commissioned a systematic literature review to look at the evidence on the role of school closures in community transmission to complement the current report. Special consideration needs to be given to educational institutions serving children with severe pre-existing medical vulnerabilities and approaches to students and staff with severe medical vulnerabilities.

Targeted measures in schools to increase physical distancing, improve ventilation and cleaning, hand-washing facilities and provision of personal protection, will probably mitigate the possible transmission of COVID-19 in schools and will be helpful in mitigating the impact of other respiratory infections during the approaching autumn and winter season, thereby reducing pressure on schools and healthcare.

Reactive school closures following community outbreaks, and cases or outbreaks in schools are unlikely to be timely enough to have a significant impact on the dynamics of the local epidemic, but may need to be made due to absenteeism, or staff and parental concerns. Preparedness plans for such closures, developed collaboratively by schools and public health authorities, will help rational decision-making and the communication of such decisions. ECDC guidance on contact management and testing in schools provides targeted testing recommendations for contact tracing (publication pending).

In conclusion, this review of evidence has shown that children do become infected and, when symptomatic, shed virus in similar quantities to adults and can transmit the disease as effectively as adults in households. The infectiousness of asymptomatic children is unknown. While very few significant outbreaks of COVID-19 have been documented they do occur, and may be difficult to detect due to the relative lack of symptoms in children. However, what evidence does exist suggests that transmission within schools has been uncommon, and therefore, if appropriate physical distancing, hygiene, and other measures are applied, schools are unlikely to be more effective propagating environments than occupational or leisure facilities with similar densities of people. Consequently, decisions on measures in schools and school closures/openings should be made consistently, in conjunction with decisions on other physical distancing measures.

## Contributing experts

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All external experts have submitted declarations of interest, and a review of these did not reveal any conflicts of interest.

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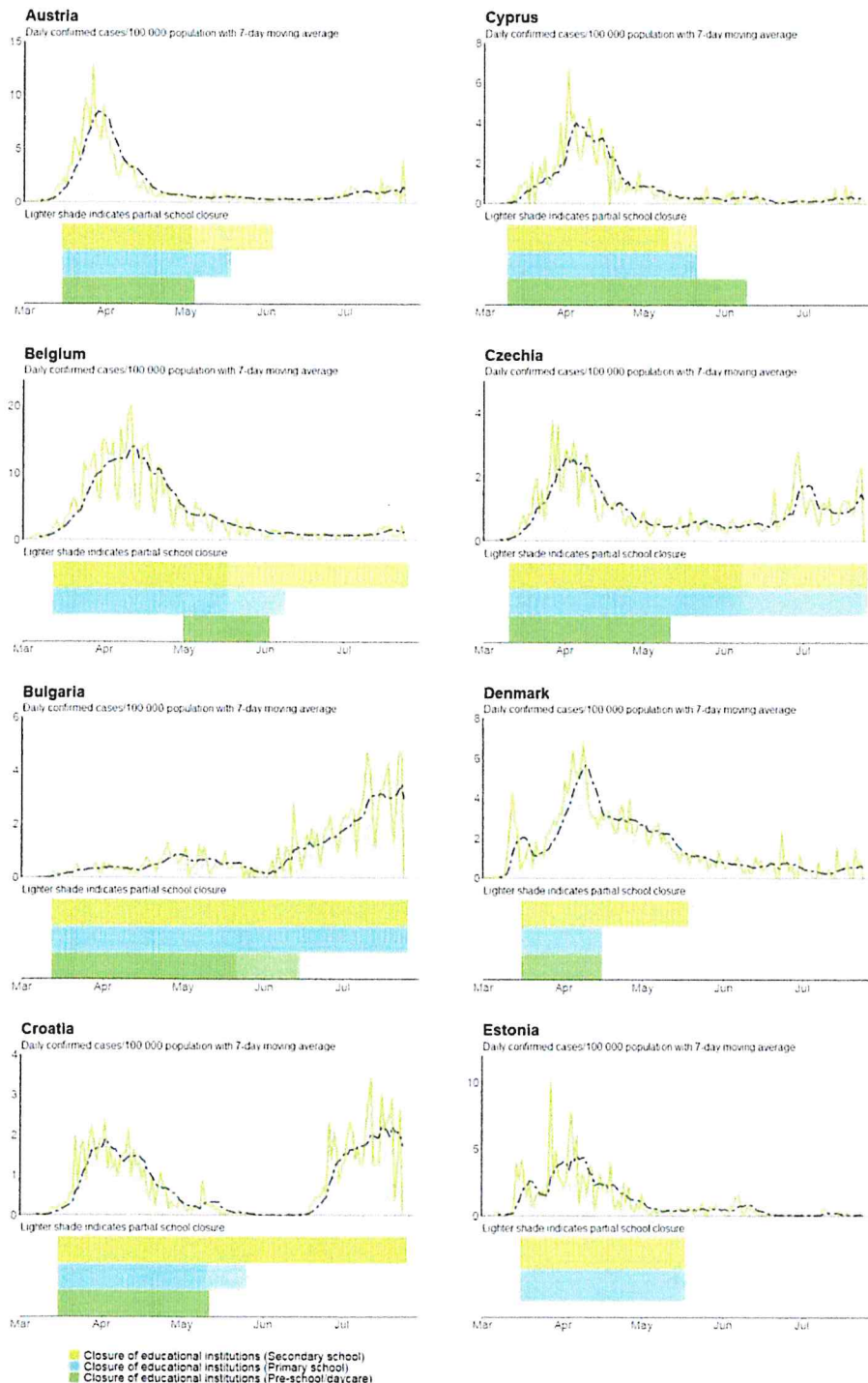
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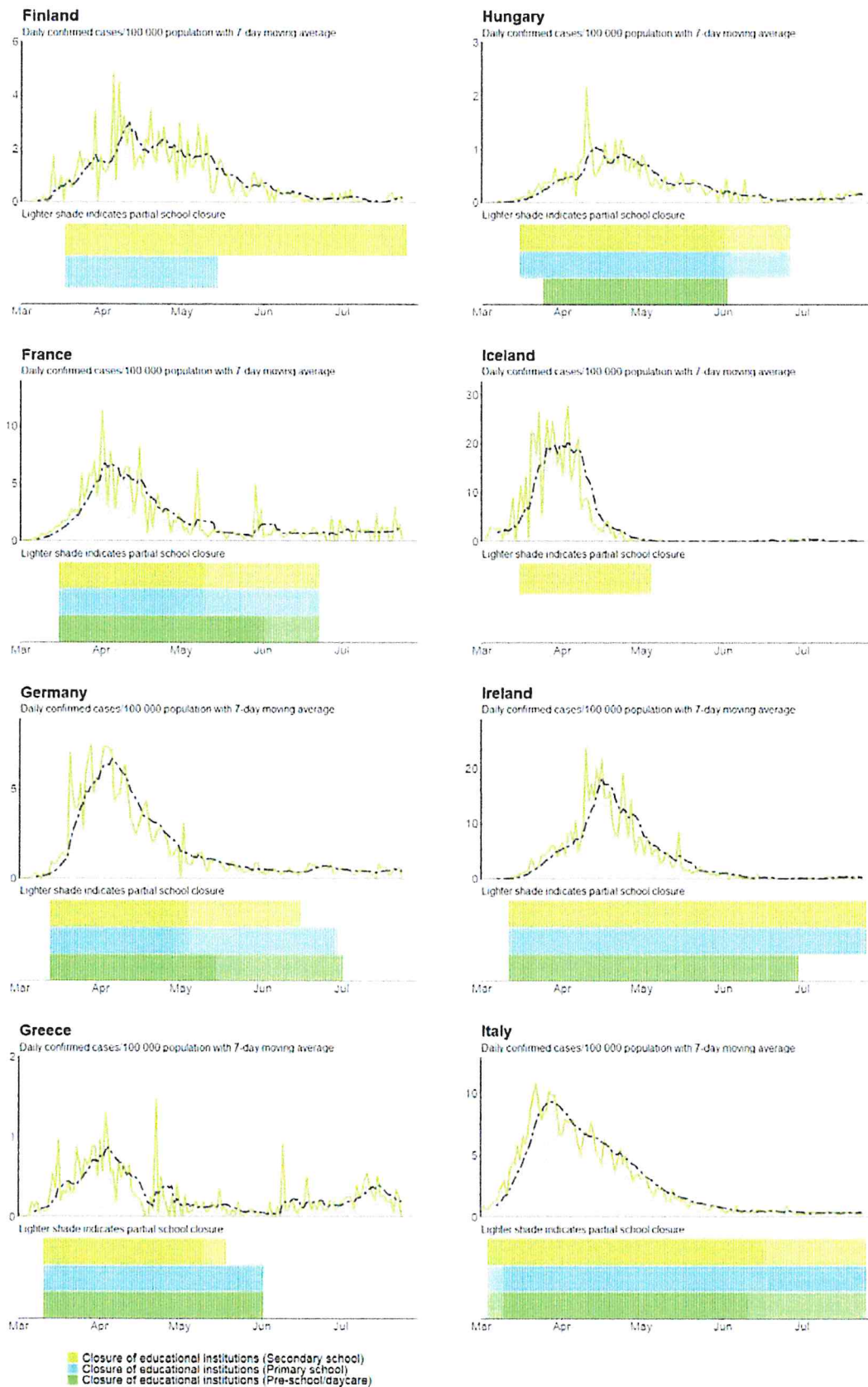
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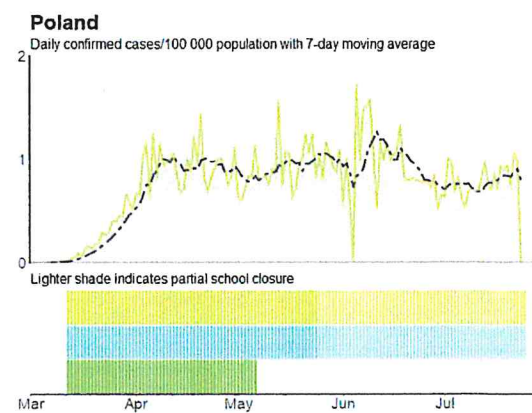
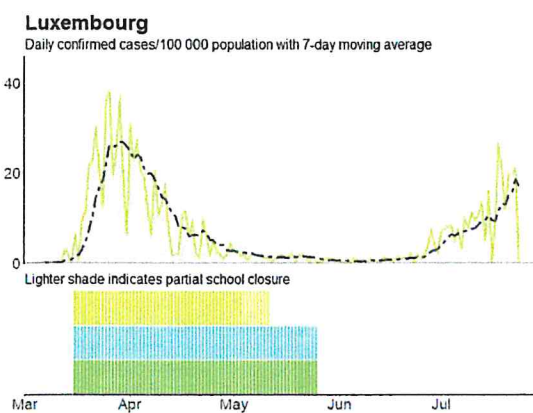
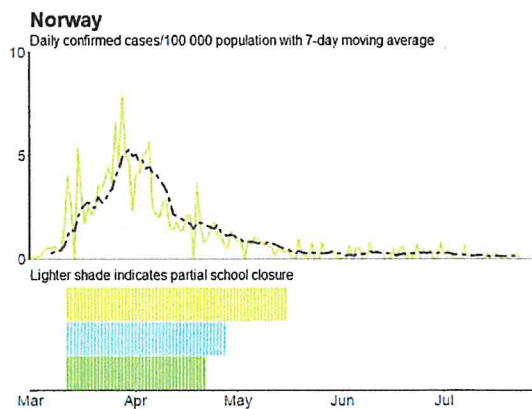
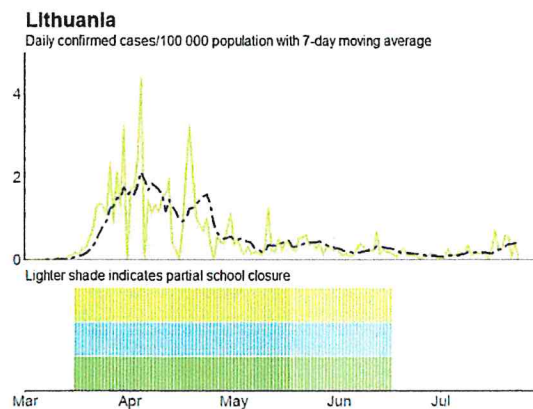
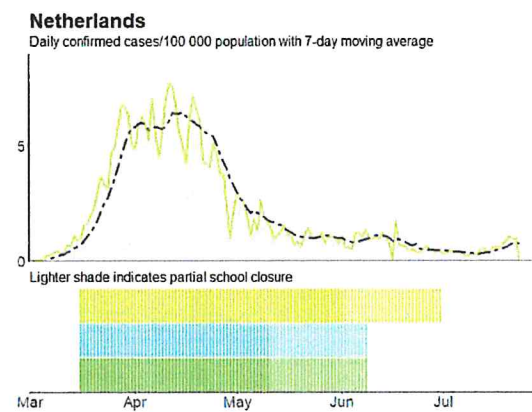
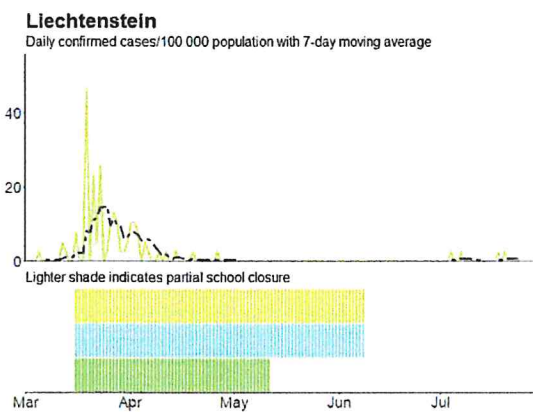
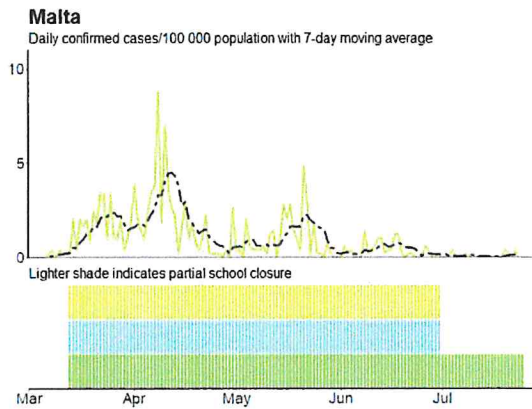
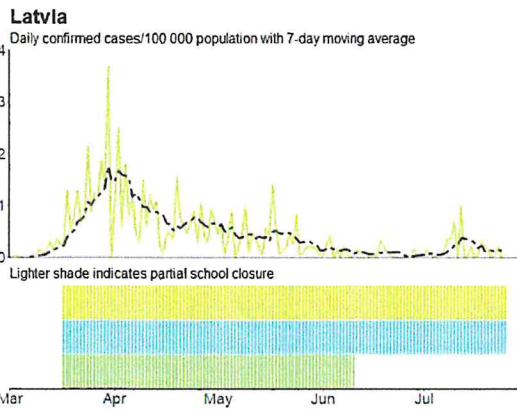
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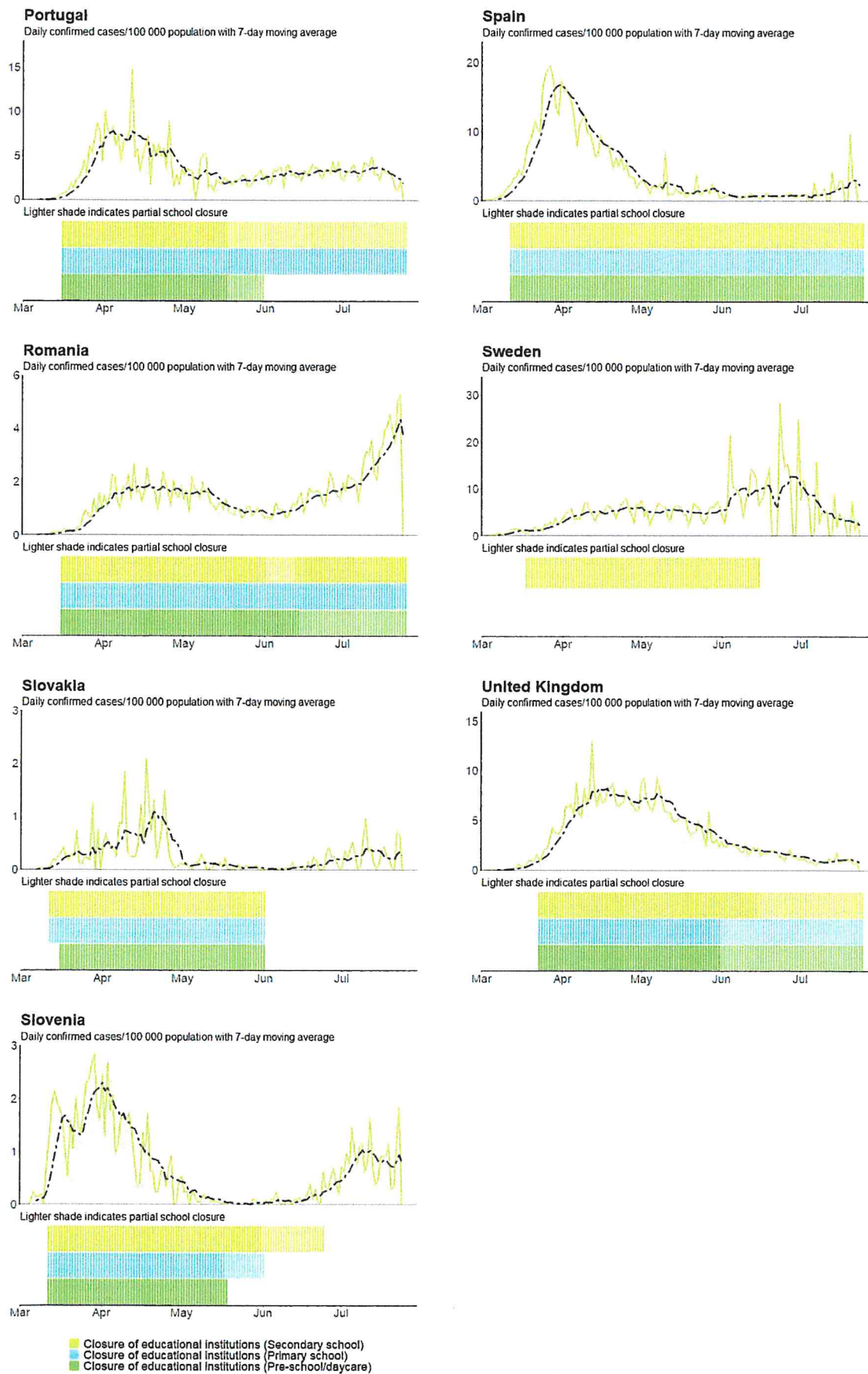
## Annex 1. School closures at national level reported from public sources and daily, confirmed cases of COVID-19 over time in EU/EEA Member States and UK, by preschool, primary and secondary school, as of 25 July 2020







■ Closure of educational institutions (Secondary school)  
■ Closure of educational institutions (Primary school)  
■ Closure of educational institutions (Pre-school/daycare)



## Annex 2. Examples of IPC recommendations currently implemented by Member States in schools remaining open and in the planning for re-opening schools

Appropriate infection prevention and control (IPC) measures in the childcare and educational setting are essential to prevent and control COVID-19 transmission and should take into account the needs of children, especially the youngest. The introduction of any measure should follow a risk assessment evaluating the capacity of each school to appropriately implement it, also taking into account the different educational settings, the population groups (children, adults, age groups, vulnerable groups among children as well as among adults) and the local epidemiological data. Based on the risks identified, appropriate non-pharmaceutical and personal protective measures can be introduced, with the aim of ensuring children have access to the most optimal and safe educational and social environment.

Non-pharmaceutical and personal protective measures currently represent the main content of public health advice provided internationally, although only indirect data about their efficacy in mitigating the risk of COVID-19 transmission is available [92].

### Physical distancing

Physical distancing is considered to be the most effective measure for reducing the risk of COVID-19 transmission. In childcare and educational facilities, this measure can definitely be considered and approaches implemented to establish it. Measures should furthermore be adapted to the specific age group, taking into account the current knowledge of disease transmission in the age group and the feasibility and appropriateness of the measures for the age group. For example, in Belgium and the Netherlands it is recognised that physical distancing (and the use of masks) is not feasible and/or appropriate for the younger age groups (< 12 years - childcare settings and primary schools) [81].

Clusters and outbreaks of COVID-19 during choir practice and performances [93] or potentially associated with speaking loudly or shouting [94] point towards the need for stricter implementation of physical distancing, avoiding gatherings of children and adolescents and particular activities entailing shouting, such as indoor athletic practice, indoor choir, singing contests or theatrical rehearsals. Other measures to facilitate physical distancing of students, depending on local risk assessment and capacities, include increasing the distance between student desks, decreasing the number of students per class, staggering class starting times, breaks and lunch times. Eating lunch outdoors, if possible, can also be considered, as well as transparent Plexiglas physical barriers at reception or information points and other fixed sites where staff come into contact with large numbers of students (e.g. serving in the canteen).

### Use of face masks

When physical distancing is impossible, the use of face masks is recommended in the community. In the school setting, it is challenging to implement this measure, as it is known that children will have a lower tolerance and/or may not be able to use the mask properly [95]. A European standard on minimum requirements for community face masks is currently available from the European Committee for Standardization [96].

A number of countries have introduced the requirement to wear face masks in schools, with variations in recommendations depending on the age groups. Most commonly the requirement to wear a face mask starts in the >12-year age group, with teachers and other staff also required to do the same (Belgium and Czechia). A number of countries have not introduced any requirements for the use of face masks, mirroring the general non-requirement of face masks in the community (Norway, Sweden, the Netherlands).

When taking care of young children, the use of face masks by the caretakers and teachers can stress the children and make them uncomfortable. For this reason, the use of face masks by teachers when taking care of children in kindergartens is not advised in Belgium, for educational and social reasons. The recommendation is the same in Czechia. In primary schools, use of face masks is recommended for teachers and other adults when physical distancing cannot be guaranteed, while it is not recommended for the students. In secondary schools, the use of face masks is recommended for both students and adults.

If a school is served by a health professional (e.g. school nurse) they should have access to appropriate personal protective equipment (PPE) and have received training for its appropriate use while examining students or staff with COVID-19-compatible symptoms. It would also be prudent for the school administrators and the health professionals serving the school to make prior arrangements for referring possible COVID-19 cases to a health facility for testing and/or treatment.

ECDC has published guidance entitled [Using face masks in the community - Reducing COVID-19 transmission from potentially asymptomatic or pre-symptomatic people through the use of face masks](#) [95]. This guidance is available in all 26 official languages of the EU.

## Hand hygiene

SARS-CoV-2 is believed to be transmitted mainly via respiratory droplets and by direct contact. However, indirect contact with contaminated fomites is also believed to play a role in transmission. Therefore, frequent and meticulous hand washing and disinfection plays a key role in mitigating the risk of COVID-19 transmission. Rigorous hand hygiene, especially after contact with frequently touched surfaces, before eating, drinking, and after using the toilet, is a measure that will be essential in all school settings and for both children and staff. In all countries within the EU/EEA and the UK, rigorous hand hygiene is considered an essential measure to be implemented.

## Respiratory etiquette

Similar to hand hygiene, respiratory etiquette is an essential measure aimed to reduce the risk of COVID-19 transmission. It includes mainly covering of nose and mouth with a paper tissue when sneezing or coughing to help reduce the spread of potentially infectious droplets. Similarly, the use of textile masks or other face coverings can potentially reduce the spread of droplets. Appropriate standards for the creation of textile masks are currently available in Europe [96]. The used paper tissues should be disposed of immediately, ideally into no-touch bins (hands-free), and hands should be washed/sanitised immediately afterwards. The UK "Guidance for full opening: schools" suggest to ensure good respiratory hygiene by promoting the 'catch it, bin it, kill it' approach, in place since the 2009 influenza pandemic. In the Netherlands, children in day care and primary school may attend with cold symptoms as long as they do not have a fever and have had no known contact with a novel coronavirus case [81].

## Ventilation

Poor ventilation in indoor spaces is associated with increased transmission of respiratory infections, particularly if confined [97]. Transmission of COVID-19 has been associated with closed spaces, including some from pre-symptomatic cases [61,98,99]. It is therefore important that proper ventilation – preferably with fresh air (i.e. by opening windows and doors) – is practiced, whenever possible, in all the school areas visited by children and adults (e.g. classrooms, corridors, canteen, etc.).

Heating, ventilation, and air conditioning (HVAC) systems may have a complementary role in decreasing transmission in indoor spaces by increasing the rate of air exchange, decreasing recirculation of air and increasing the use of outdoor air when well maintained. It is important that HVAC systems are properly maintained and operated to fulfil their role, according to manufacturer's instructions. In the Belgian and the UK guidelines, ventilation is considered as a key measure.

ECDC has published a guidance document on Heating, ventilation and air-conditioning systems in the context of COVID-19 [100]. This document aims to provide guidance for public health authorities on the ventilation of indoor spaces in the context of COVID-19.

## Cleaning and disinfection

The survival of SARS-CoV-2 on different surfaces was evaluated early on in the pandemic, mostly in experimental conditions, which cannot be directly transposed to real-life situations. The environmental stability of SARS-CoV-2 was up to three hours in the air post-aerosolisation, up to 24 hours on cardboard and up to two to three days on plastic and stainless steel, albeit with significantly decreased titres [101]. Due to the involvement of fomites in the transmission of COVID-19, increasing the depth and frequency of cleaning and disinfection of frequently touched surfaces (e.g. doorknobs and door bars, chairs and armrests, table tops, light switches, handrails, water taps, elevator buttons, computer keyboards and screens, touch screens), shared toilets, etc. is considered an important measure when deciding reopening schools.

ECDC has published a guidance on [Disinfection of environments in healthcare and non-healthcare settings potentially contaminated with SARS-CoV-2](#) [102]. This guidance is available in all the 26 official languages of the EU [102].

## Transportation to/from school

Crowding in public transport and their use by large numbers of people can contribute to direct transmission of COVID-19 through respiratory droplets and indirect transmission through contaminated surfaces. The use of public transportation or other shared transportation by students and school staff can play a substantial role in the potential transmission of COVID-19. Physical distancing during transport, wearing face masks and cleaning and disinfection of the frequently touched surfaces of school buses should be implemented.

ECDC has published a guidance on [Considerations for infection, prevention and control measures on public transport in the context of COVID-19](#) [103]. This document provides advice on personal protective measures on public transport (including bus, metro, train, commuter boats)

## Annex 3. Examples of national and international guidance on school operations during COVID-19

Organisation	Link
Government of Canada	<a href="#">COVID-19 Risk mitigation tool for child and youth settings operating during the COVID-19 pandemic</a>
Danish Health Authority	<a href="#">Materials for reopening day offers</a>
<b>French Association of Ambulatory Paediatrics (AFPA - Association Française de Pédiatrie Ambulatoire)</b>	<a href="#">Retour à l'école - Propositions 2020.</a>
French Paediatrician's Society (Société française de pédiatrie)	<a href="#">Propositions de la société française de pédiatrie et des sociétés de spécialités pédiatriques pour favoriser le retour des enfants avec maladie chronique dans leur établissement scolaire. 2020</a>
French National Academy of Medicine (Académie nationale de médecine)	<a href="#">Mesures sanitaires pour la réouverture des écoles, collèges, lycées et crèches. Communiqué. Académie nationale de médecine; 2020.</a>
French Ministry of Education	<a href="#">Protocole sanitaire. Guide relatif au fonctionnement des écoles et des établissements scolaires dans le contexte COVID-19 à compter de la rentrée scolaire 2020-2021</a>
National Public Health Organisation, Greece	<a href="#">Primary School Instructions (COVID-19)</a>
Norwegian Directorate of Health- (Helsedirektoratet)	<a href="#">Infection protection in kindergartens (covid-19)</a>
Netherlands National Institute for Public Health and the Environment (RIVM)	<a href="#">Children and COVID-19</a>
Portugal	<a href="#">Orientações para a reabertura da educação pré-escolar</a>
Swedish Public Health Authority (Folkhälsomyndigheten)	<a href="#">Covid-19 hos barn och unga</a>
UK government, Department for Education	<a href="#">Getting your school, college or educational setting ready for COVID-19. 2020.</a>
US Centers for Disease Control and Prevention	<a href="#">Preparing K-12 School Administrators for a Safe Return to School in Fall 2020</a>  <a href="#">Considerations for Schools: Operating schools during COVID-19</a>
US National Academies of Sciences Engineering Medicine	<a href="#">Reopening K-12 Schools During the COVID-19 Pandemic: Prioritizing Health, Equity, and Communities (2020)</a>
World Health Organization	<a href="#">COVID-19: IFRC, UNICEF and WHO issue guidance to protect children and support safe school operations</a>

## Annex 4. Disease background literature search string in PubMed

The search string used in PubMed is:

("COVID-19"[Supplementary Concept] OR "severe acute respiratory syndrome coronavirus 2"[Supplementary Concept] OR "COVID-19 vaccine"[Supplementary Concept] OR "COVID-19 serotherapy"[Supplementary Concept] OR "COVID-19 diagnostic testing"[Supplementary Concept] OR "COVID-19 drug treatment"[Supplementary Concept] OR "LAMP assay"[Supplementary Concept] OR "Coronavirus Infections"[Mesh:noexp] OR "Wuhan coronavirus"[TW] OR "Wuhan seafood market pneumonia virus"[TW] OR COVID19[TW] OR "COVID-19"[TW] OR "COVID-2019"[TW] OR "coronavirus disease 2019"[TW] OR "SARS-CoV-2"[TW] OR SARS2[TW] OR "2019-nCoV"[TW] OR "2019 novel coronavirus"[TW] OR "severe acute respiratory syndrome coronavirus 2"[TW] OR "2019 novel coronavirus infection"[TW] OR "coronavirus disease 2019"[TW] OR "coronavirus disease-19"[TW] OR "novel coronavirus"[TW] OR coronavirus[TW] OR "SARS-CoV-19"[TW] OR "SARS-CoV-2019"[TW])

### Search strategy for literature about Coronavirus in school settings

The search strategy for literature in school settings contained the following keywords: COVID-19, Outbreak, Coronavirus, SARS-COV-2 and various educational setting (daycare, preschool, schools, educational settings, primary school, secondary school, high schools, teachers, pupils, students, educational institutions, universities, adult educational institutions, lecturers).

Relevant publications were identified by searching:

- Targeted websites of national health authorities and universities;
- Generic web search engines (e.g. Google) through customised searches;
- PubMed;
- pre-print servers for non-peer-reviewed scientific manuscripts; and
- Media.

Searches were complemented by hand searches and retrieval of any additional publications that met the eligibility criteria that could be found in the lists of references.

### Inclusion criteria:

Studies published on official national websites, in peer-reviewed scientific journals and pre-prints or identified from grey literature and media were included if they described:

- SARS-COV-2 transmission in preschools, primary and secondary schools
- Secondary or tertiary transmission in preschools, primary, secondary schools and households
- Outbreaks in preschools, primary and secondary schools
- Mortality in educational settings
- Modelling of SARS-COV-2 transmission.

### Exclusion criteria:

Studies were excluded if they described:

- Transmission in extracurricular activities outside the educational setting (e.g., gym clubs),
- Transmission in young adults (>18 years) in the higher education setting,
- School closure as an NPI on the transmission.

Titles and abstracts identified from searches were screened. Reviewers read the full-text versions of the articles and retained them if they met the inclusion criteria. Data extracted from the included studies comprised: country, authors, year, total number of index children and adult cases, method of diagnosis, number of affected schools, number of cases, number of contact tested, total number of secondary or tertiary cases, etc.

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