

# Covid-19 et professionnels de santé

Sandra Fournier

Research Brief

Seidelman et al

Universal masking is an effective strategy to flatten the severe acute respiratory coronavirus virus 2 (SARS-CoV-2) healthcare worker epidemiologic curve

**Impact du masque universel sur incidence des infections à SARS-CoV-2 chez HCWs**  
**Interrogatoire de chaque HCW avec COVID-19 : acquisition d'origine communautaire (38%), hospitalière (22%) ou inconnue (40%)**  
**Parmi les acquisitions hospitalières : 70% par contacts sans masque avec un collègue, 30% avec un patient**

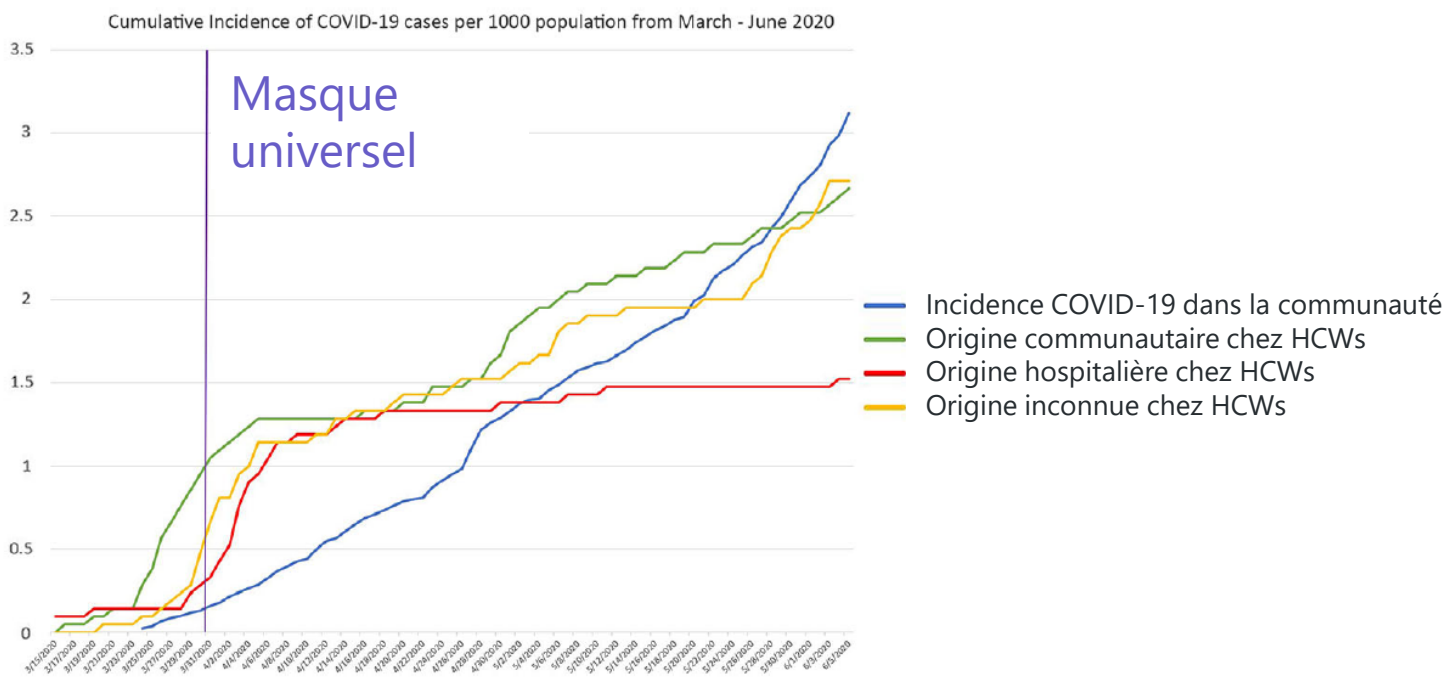


Fig. 1. Cumulative incidence of positive SARS-2-CoV tests among healthcare workers stratified by community-acquired, healthcare-acquired, or unknown acquisition compared to local community cumulative incidence rates from Durham, Granville, Orange, Person, and Wake counties in North Carolina.

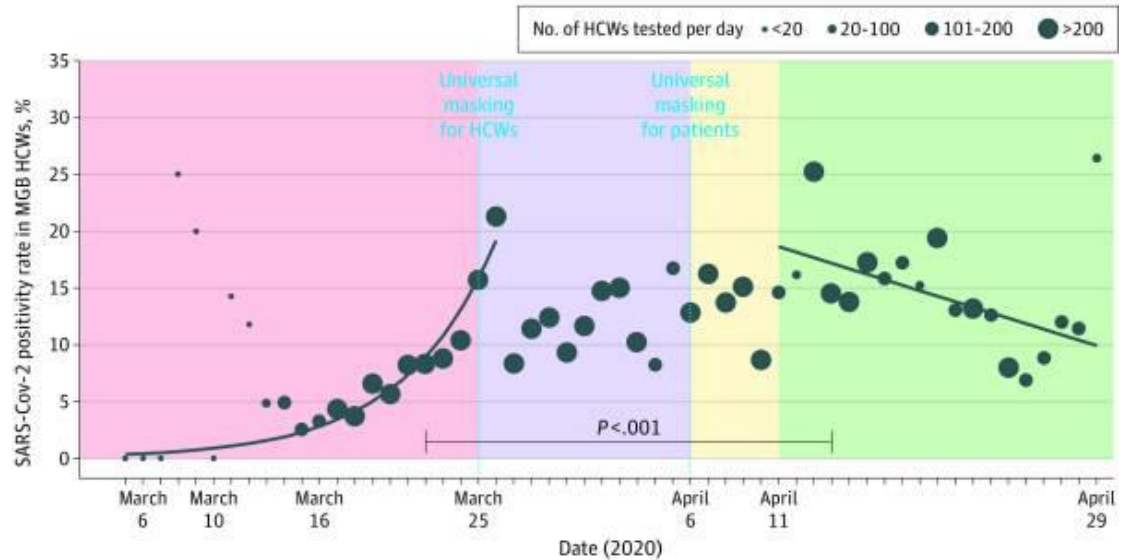
# Association Between Universal Masking in a Health Care System and SARS-CoV-2 Positivity Among Health Care Workers

Wang et al

Massachusetts, 12 hôpitaux, 75000 employés

Mars 2020 masque universel pour tous les HCWs puis tous les patients

Diminution des infections chez les personnels avant la diminution de l'épidémie dans la région



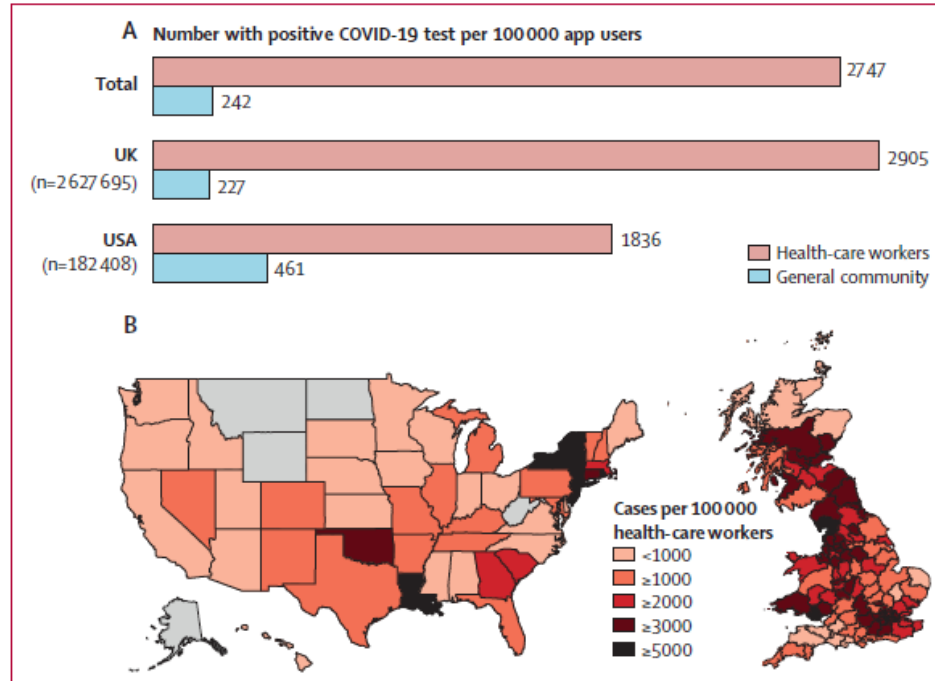
# Risk of COVID-19 among front-line health-care workers and the general community: a prospective cohort study

*Lancet Public Health* 2020; 5: e475–83

Nguyen et al

- Auto déclaration sur application smartphone
- 2 035 395 individus issus de la communauté et 99 795 HCWs

→ augmentation COVID X 3 chez les HCWs  
 → Autres facteurs : EPI inadéquats, ethnique (noire, asiatique)



**Figure: Risk of testing positive for COVID-19 among front-line health-care workers**  
 (A) Between March 24 and April 23, 2020, considerable disparities were noted in prevalence of a positive COVID-19 test among front-line health-care workers compared with the general community, in both the UK and the USA. (B) Prevalence of a positive COVID-19 test reported by front-line health-care workers in the UK and the USA. Regions in grey did not have sufficient data for analysis. app=COVID-19 Symptom Study smartphone application.

	Adequate PPE	Reused PPE	Inadequate PPE
<b>Overall</b>			
Event/person-days	592/332 901	146/80728	157/60916
Unadjusted hazard ratio (95% CI)	1 (ref)	1.46 (1.21-1.76)	1.32 (1.10-1.57)
Multivariate-adjusted hazard ratio (95% CI)	1 (ref)	1.46 (1.21-1.76)	1.31 (1.10-1.56)

# SARS-CoV-2 Seroprevalence among Healthcare, First Response, and Public Safety Personnel, Detroit Metropolitan Area, Michigan, USA, May–June 2020

Emerging Infectious Diseases • www.cdc.gov/eid • Vol. 26, No. 12, December 2020

## Akinbami et al

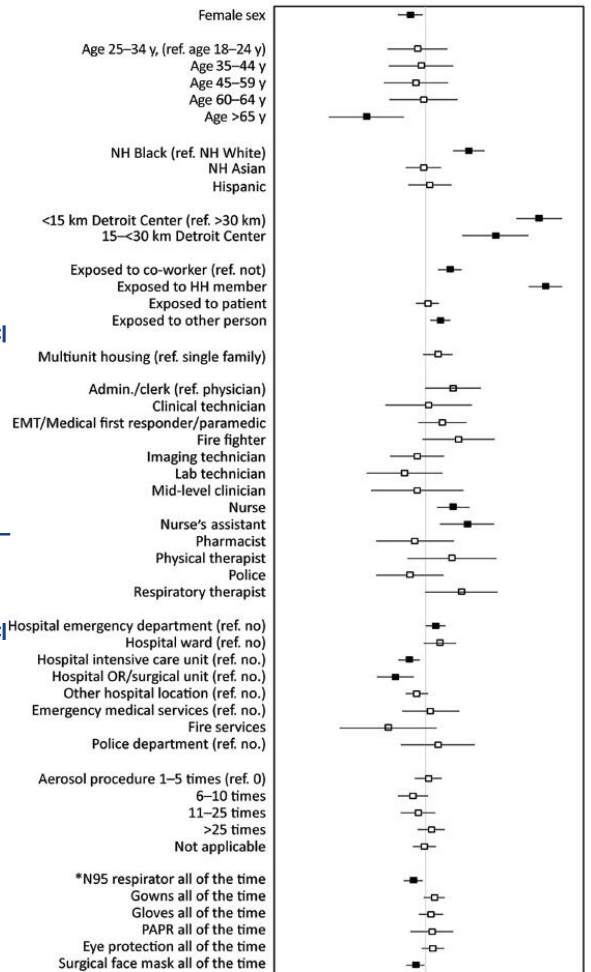
16,403 HCWs, 6.9% séro +

### FDR :

- Exposition familiale [aOR] 6.18, 95% CI 4.81–7.93)
- AS (aOR 1.88, 95% CI 1.24–2.83) et IDE (aOR 1.52, 95% CI 1.18–1.95)
- Travailler dans SAU (aOR 1.16, 95% CI 1.002–1.35).

### Diminution du risque

- FFP2 (aOR 0.83, 95% CI 0.72–0.95)
- masque chirurgical facemasks (aOR 0.86, 95% CI 0.75–0.98)



Sandra Fournier

# Severe Acute Respiratory Syndrome Coronavirus 2 Seropositivity among Healthcare Personnel in Hospitals and Nursing Homes, Rhode Island, USA, July–August 2020

Emerging Infectious Diseases • www.cdc.gov/eid • Vol. 27, No. 3, March 2021

## Akinbami et al

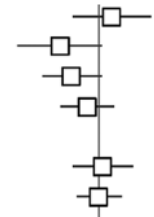
9863 HCWs, 4,6 % +

Risque augmenté chez

- personnels de maison de retraite +++
- IDE,
- service COVID,
- certaines ethnies (black, hispanic),

Pénurie d'EPI : pas d'augmentation de transmission

No shortage  
Reuse  
Extended use  
Extended and reuse  
N95 mask shortage (ref no)  
Do not use N95 mask



# Transmission Routes of Severe Acute Respiratory Syndrome Coronavirus 2 Among Healthcare Workers of a French University Hospital in Paris, France

Contejean et al

Open Forum Infectious Diseases

DOI: 10.1093/ofid/ofab054

## Etude cas/témoins (336 /228)

### Facteurs de risque en analyse multivariée

#### Période préconfinement

*Au moins 10 contacts avec un collègue sans masque OR = 2.58 [1.49-4.6]*

*Port systématique d'un masque en dehors de chez soi OR = 0.43 [0.21-0.85]*

#### Pendant le confinement

*Au moins un contact avec un patient confirmé ou suspect de COVID sans masque OR = 3.87 [1.73-9.89]*

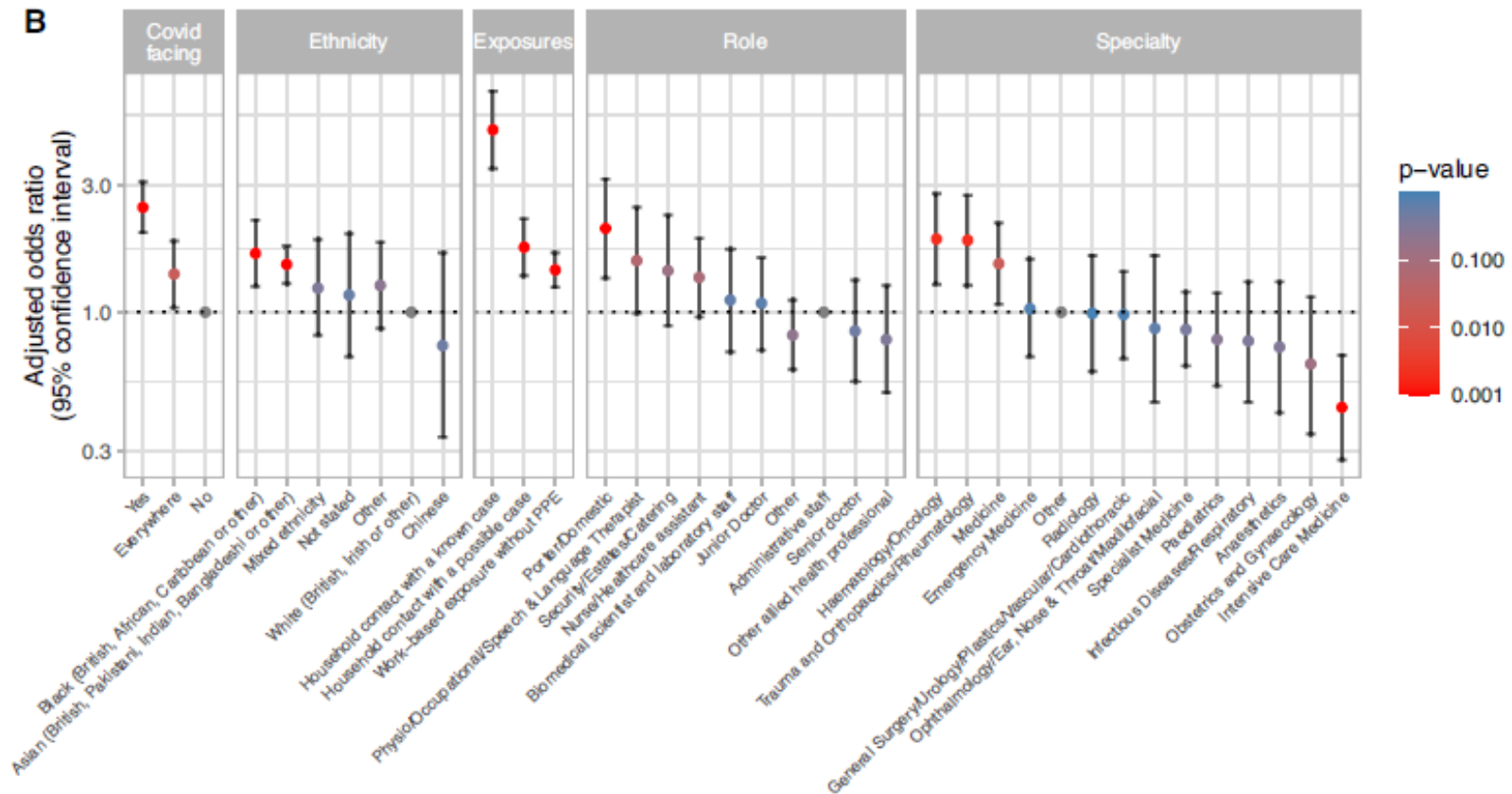
Variable	Overall n = 564	Controls (HCW-) n = 228	Cases (HCW+) n = 336	Prelockdown Period		Lockdown Period	
				Univariate Anal- ysis OR [95% CI]	Multivariate Anal- ysis OR [95% CI]	Univariate Anal- ysis OR [95% CI]	Multivariate Anal- ysis OR [95% CI]
<b>Exposures</b>							
<b>In-hospital exposures</b>							
<b>Exposure to patients</b>							
Occupational activities with direct patient facing	388 (69)	154 (68)	234 (70)	0.86 [0.53–1.40]	-	1.47 [0.76–2.82] <sup>f</sup>	-
Regularly posted in a unit dedicated to COVID-19 patients	123 (22)	48 (21)	75 (22)	0.59 [0.28–1.25] <sup>f</sup>	-	1.53 [0.82–2.88] <sup>f</sup>	-
Had on average >1/day close contact with suspected or confirmed COVID-19 patients without PPE <sup>b</sup>	100 (18)	28 (12)	72 (21)	1.22 [0.64–2.38]	-	3.85 [1.59–10.8] <sup>d</sup>	<b>3.87 [1.73–9.89]</b>
Had on average >1/day close contact with suspected or confirmed COVID-19 patients with PPE	204 (38)	93 (45)	111 (34)	0.28 [0.16–0.51] <sup>f</sup>	-	1.04 [0.56–1.92]	-
<b>Exposure to Colleagues</b>							
Wears a medical mask always/most of the time at hospital	372 (67)	163 (73)	209 (63)	0.45 [0.28–0.72] <sup>d</sup>	-	0.99 [0.34–2.63]	-
Spends on average >1 hour/day with colleagues without mask	153 (31)	42 (24)	111 (34)	2.77 [1.63–4.77] <sup>d</sup>	-	0.52 [0.20–1.43] <sup>f</sup>	-
Had on average >10 close contacts/day with colleagues without mask	101 (18)	26 (12)	75 (23)	2.80 [1.57–5.16] <sup>d</sup>	<b>2.58 [1.49–4.60]</b>	1.36 [0.42–5.13]	-
<b>Out-of-Hospital Exposure</b>							
Uses public transports	328 (58)	127 (56)	201 (60)	0.92 [0.57–1.47]	-	1.86 [1.03–3.37] <sup>f</sup>	-
Systematically wears a mask outside home	96 (17)	50 (22)	46 (14)	0.40 [0.19–0.83] <sup>d</sup>	<b>0.43 [0.21–0.85]</b>	0.69 [0.35–1.35] <sup>f</sup>	-
Systematically washes hands when back home	509 (91)	210 (92)	299 (90)	1.01 [0.47–2.13]	-	0.31 [0.03–1.46] <sup>f</sup>	-
Leaves home on average >1 times a week	495 (88)	205 (90)	290 (86)	0.81 [0.33–1.88]	-	0.62 [0.25–1.42] <sup>f</sup>	-

# Differential occupational risks to healthcare workers from SARS-CoV-2 observed during a prospective observational study

Eyre et al. eLife 2020;9:e60675. DOI: <https://doi.org/10.7554/eLife.60675>

1128 cas de COVID / 10034 HCWs

FdR en analyse multivariée : contact communautaire avec un cas, exposition professionnelle à un cas sans EPI, unité COVID, ethnie, certaines spécialités  
Protecteur : travail en soins intensifs



# COVID-19 in health-care workers in three hospitals in the south of the Netherlands: a cross-sectional study

Lancet Infect Dis 2020;  
20: 1273-80

Sikkema et al

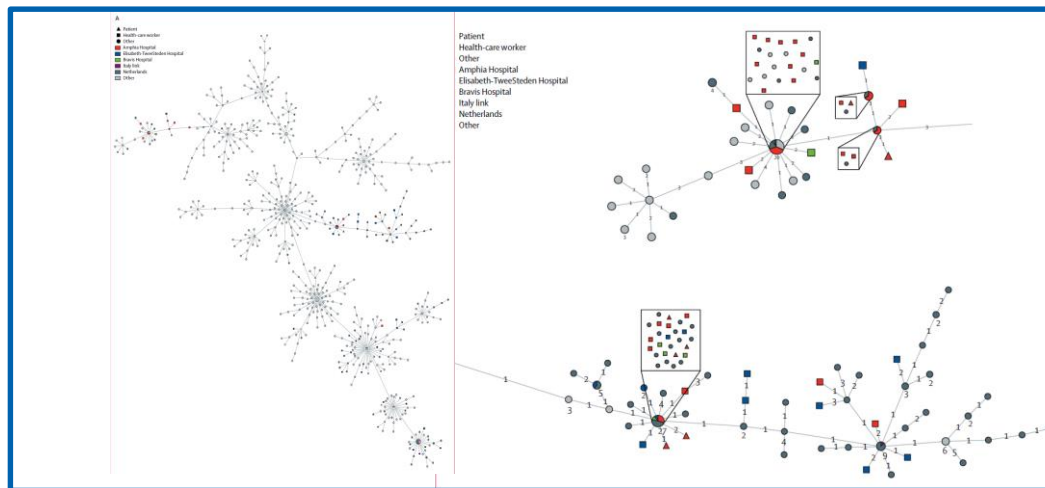
Etude transversale dans 3 hôpitaux des Pays Bas

Dépistages personnels avec symptômes, interview structurés et séquençage complet du génome → analyse des données de 96 personnels + sequences genome 50 HCWs et 10 patients.

3 clusters, avec souches diffusant dans la région.

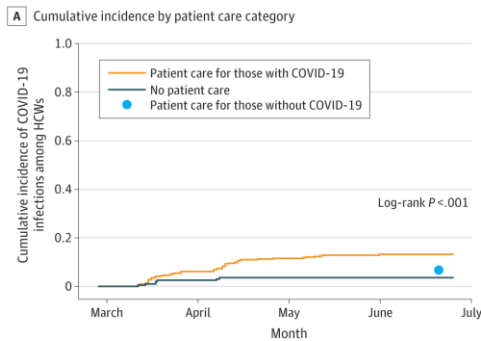
→ multiples introductions dans les hôpitaux à partir des cas acquis dans la communauté (rassemblement de masse, carnaval)

→ Pas d'argument pour une large transmission nosocomiale comme source d'infection chez les HCWs ni les patients

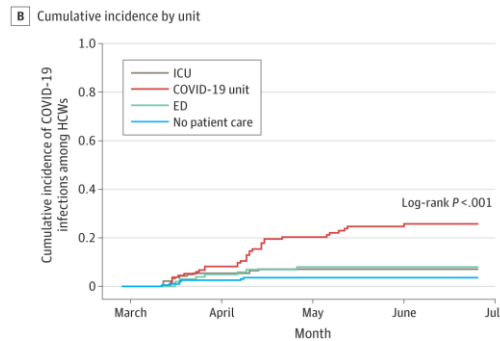


# Serologic Surveillance and Phylogenetic Analysis of SARS-CoV-2 Infection Among Hospital Health Care Workers **Sikkens et al**

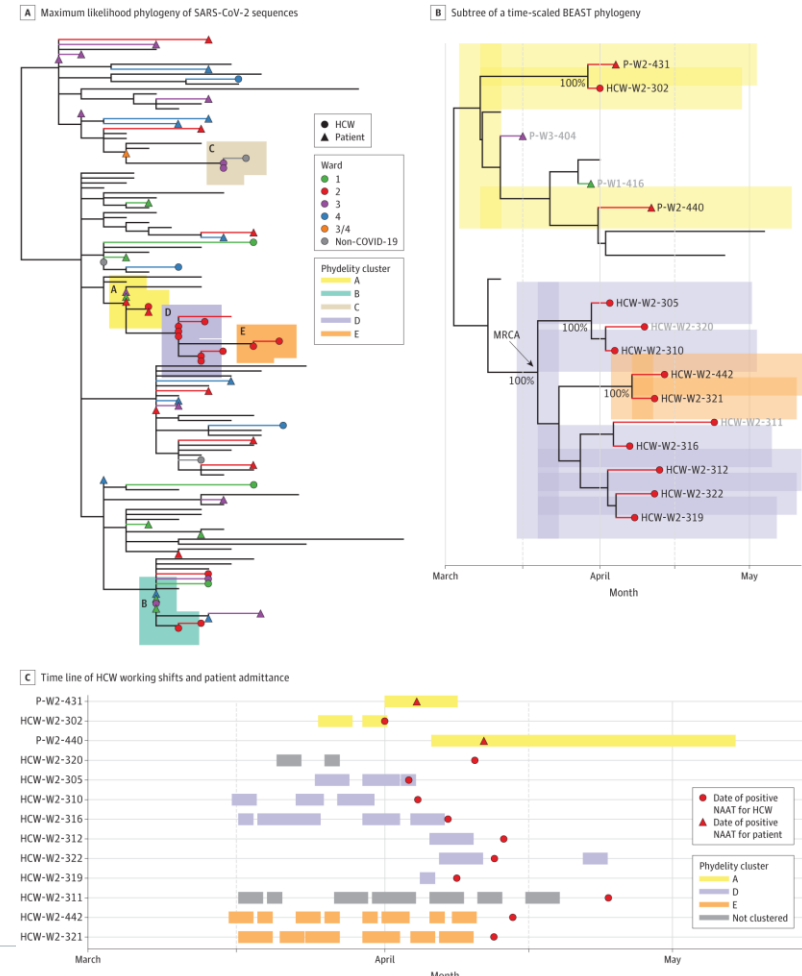
- Etude de cohorte, HCWs de ≠ services + sérologies + questionnaires + analyses phylogénétiques et épidémiologiques
- Augmentation risque d'infection HCWs des services COVID-19
- Clusters touchant uniquement des HCWs
  - rôle important de la transmission entre HCWs.
  - aucune preuve de transmission de patients à HCWs



No. at risk	March	April	May	June	July
Patient care for those with COVID-19	439	412	356	330	245
No patient care	198	193	180	177	156



No. at risk	March	April	May	June	July
ICU	186	176	162	149	107
COVID-19 unit	134	123	97	86	70
ED	97	102	88	86	62
No patient care	198	193	180	177	156



# SARS-CoV-2 infection rates of antibody-positive compared with antibody-negative health-care workers in England: a large, multicentre, prospective cohort study (SIREN)

Lancet 2021; 397: 1459–69

Hall et al

**Cohorte prospective multicentrique  
25 661 HCWs**

**SARS-CoV-2 PCR et sérologie toutes les  
2–4 semaines + questionnaires toutes  
les 2 semaines (symptômes et  
exposition)**

**ATCD COVID associé à une réduction de  
risque d'infection de 84%**

**Délai median entre primo infection et  
reinfection 200 jours**

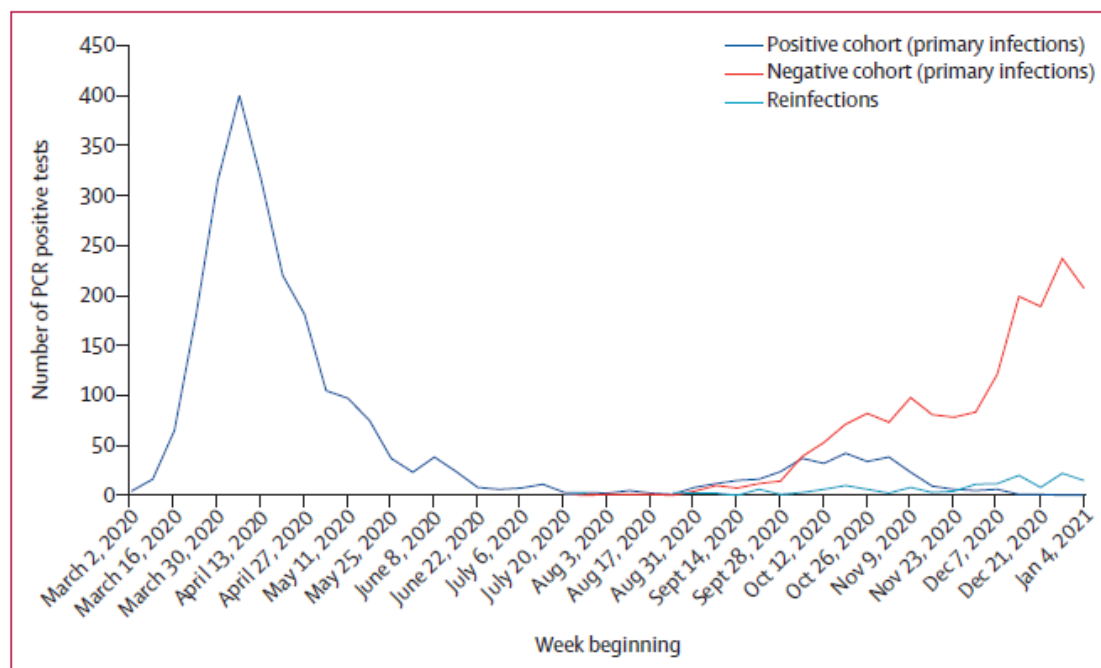


Figure 2: Weekly frequency of SIREN participants with a first positive PCR test result by baseline cohort assignment, from March, 2020, to January, 2021

# Symptoms of Anxiety, Depression, and Peritraumatic Dissociation in Critical Care Clinicians Managing Patients with COVID-19

A Cross-Sectional Study **Azoulay E et al**

American Journal of Respiratory and Critical Care Medicine Volume 202 Number 10 | November 15 2020

- 21 réanimations en France, 20/04 au 21/05/2020, 10 répondants
- Prévalence anxiété 50.4%, dépression 30.4%, dissociation péritraumatique 32%.
- Analyse multivariée : sexe masculin indépendamment associé avec une plus faible prevalence.
- 6 déterminants associés aux troubles psychiques:
  - ▶ peur d'être infecté,
  - ▶ incapacité de se reposer,
  - ▶ incapacité de s'occuper de sa famille,
  - ▶ émotions difficiles,
  - ▶ politiques de restriction des visites
  - ▶ fait d'être témoin de décisions de fin de vie.

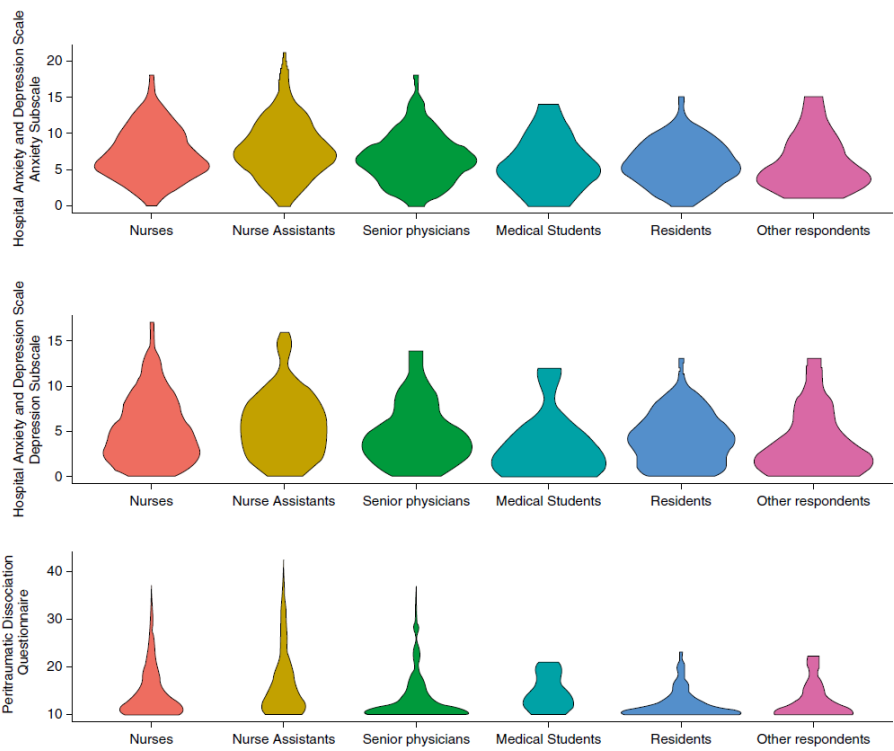


Figure 1. Violin plots depicting the probability density of anxiety, depression, and peritraumatic dissociation across different categories of healthcare providers.

# Early rate reductions of SARS-CoV-2 infection and COVID-19 in BNT162b2 vaccine recipients



Published Online  
February 18, 2021  
[https://doi.org/10.1016/S0140-6736\(21\)00448-7](https://doi.org/10.1016/S0140-6736(21)00448-7)

For Myanmar's COVID-19

**Amit et al** [www.thelancet.com](http://www.thelancet.com) Vol 397 March 6, 2021

**9109 HCWs, 7214 (79%) vaccines 1 dose et 6037 (66%) vaccinés 2 doses.**  
**170 infections, 89 (52%) chez non vaccinés, 78 (46%) après la 1ère dose, et 3 (2%) après la 2de.**  
**Parmi 125 infections étudiées, 87 (70%) acquisitions communautaires, pas de cluster nosocomial**

COVID-19 vaccine coverage in health-care workers in England and effectiveness of BNT162b2 mRNA vaccine against infection (SIREN): a prospective, multicentre, cohort study **Hall et al** *Lancet* 2021; 397: 1725-35

**23 324 participants, 104 sites**  
**8203 (35%) positifs et 15 121 (65%) négatifs.**

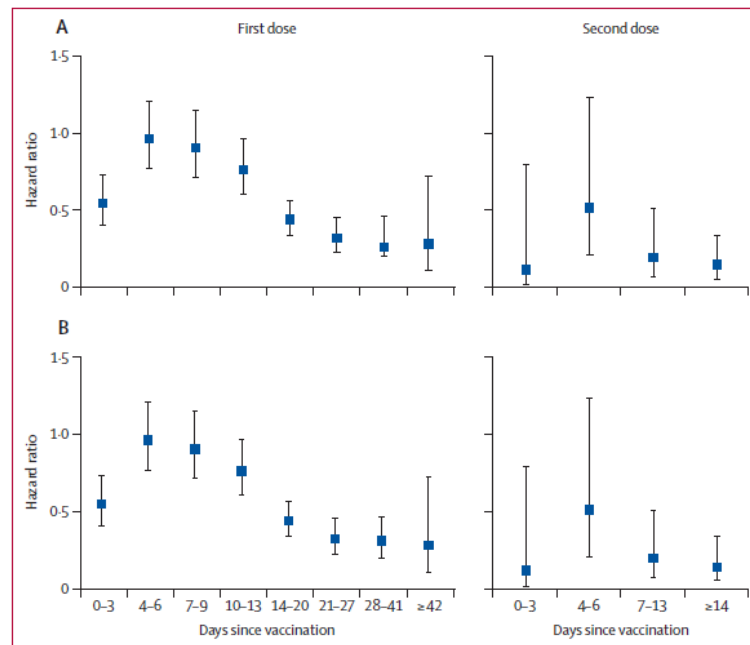
**Efficacité vaccinale :**

**-> 70% (IC 95% 55-85) 21 jours après la première dose de vaccin**  
**-> 85% (74-96) 7 jours après deux doses**

	Unvaccinated	Vaccinated	
		1-14 days after first dose	15-28 days after first dose
<b>All SARS-CoV-2 positive</b>			
Number of cases	89	55	26
Number of exposure days	120575	100433	88126
Rate per 10 000 person-days	7.4	5.5	3.0
Rate reduction compared with unvaccinated (95% CI)	--	26% (-4 to 47)	60% (38 to 74)
Adjusted rate reduction compared with unvaccinated (95% CI)*	--	30% (2 to 50)	75% (72 to 84)
<b>Symptomatic COVID-19</b>			
Number of cases	60	28	11
Number of exposure days	120575	100433	88126
Rate per 10 000 person-days	5.0	2.8	1.2
Rate reduction compared with unvaccinated (95% CI)	--	44% (12 to 64)	75% (52 to 87)
Adjusted rate reduction compared with unvaccinated (95% CI)*	--	47% (17 to 66)	85% (71 to 92)

SARS-CoV-2 positivity was determined by PCR. \*Rate ratios of new cases in vaccinated compared with unvaccinated health-care workers each day were adjusted for community exposure rates using Poisson regression (appendix). The adjusted estimates were subtracted from 1 to obtain rate reductions.

**Table:** Rate reductions of SARS-CoV-2 infections and COVID-19 cases in health-care workers at the Sheba Medical Centre, Israel, from December, 2020, to January, 2021



**Figure 2:** Adjusted hazard ratios at post-vaccination intervals in the (A) full cohort (n=23324) and (B) negative cohort (n=15121), Dec 7, 2020 to Feb 5, 2021

Sandra Fournier



# Virological characteristics of SARS-CoV-2 vaccine breakthrough infections in health care workers

Shamier et al

medRxiv preprint doi: <https://doi.org/10.1101/2021.08.20.21262158>

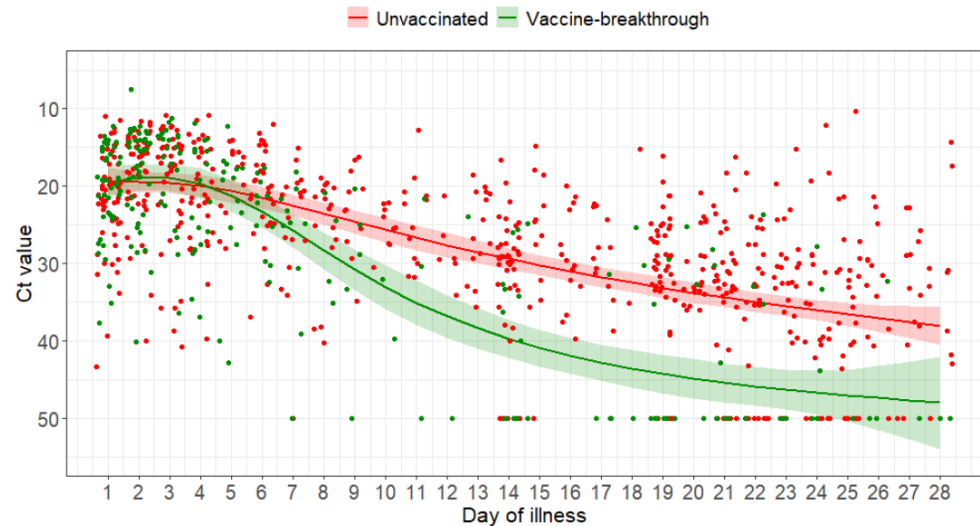
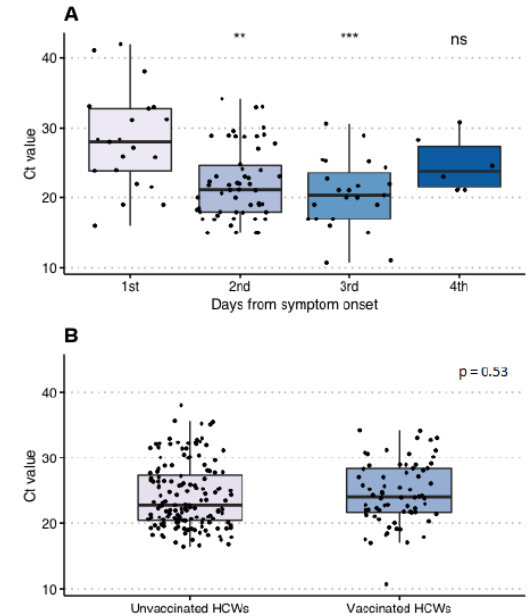
161 échecs vaccinaux chez 24 706 HCWs, variant Delta majoritaire  
CT values identiques chez vaccinés et non vaccinés

Virological and serological kinetics of SARS-CoV-2 Delta variant vaccine-breakthrough infections: a multi-center cohort study **Po Ying Chia et al**  
medRxiv preprint doi: <https://doi.org/10.1101/2021.07.28.21261295>

COVID-19 Delta chez 71 vaccins et 130 non vaccinés

COVID-19 sévères plus rares après vaccin  
(aOR 0.07 95%CI: 0.015-0.335, p=0.001).

PCR (Ct) values similaires entre groupes au moment du diagnostic, mais diminution charge virale plus rapide chez les vaccins



CORRESPONDENCE

## Effect of Vaccination on Household Transmission of SARS-CoV-2 in England

Harris et al  
N Engl J Med. 2021 Aug 19;385(8):759-760

Cohorte de 365 447 foyers familiaux avec un cas index COVID et 1 018 842 contacts.

Comparaison chez **contacts de cas vaccinés** (au moins 1 dose de vaccin (Pfz ou AZ), 21 j ou plus avant d'être testé +) et **non vaccinés** du risque de **cas 2aires** (test SARS-CoV-2 +, 2 à 14 jours après diag cas index) parmi les **contacts familiaux non vaccinés**.

**Probabilité de transmission à domicile** : environ 40 à 50 % plus faible dans les foyers de patients vaccinés

Résultats similaires pour les deux vaccins.

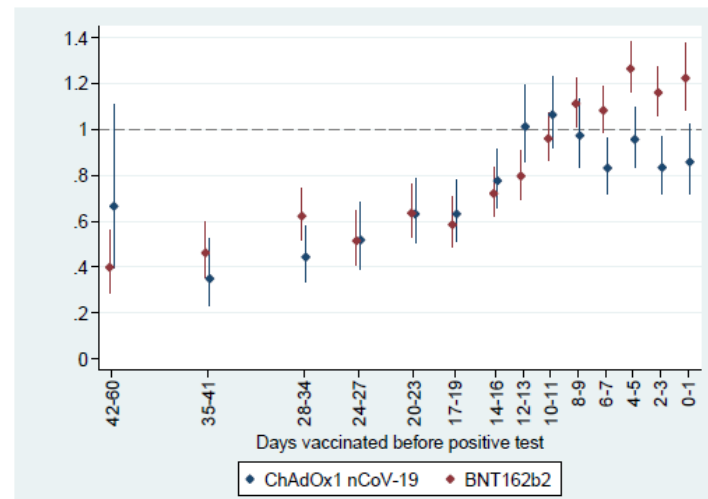
**Effets protecteurs 14 jours** après la vaccination

**Table 1.** Numbers of Household Contacts and Secondary Cases of Covid-19, According to Vaccination Status of Index Patient, and Adjusted Odds Ratios.\*

Vaccination Status of Index Patient	Household Contacts no.	Secondary Cases no. (%)	Adjusted Odds Ratio (95% CI)
Not vaccinated before testing positive	960,765	96,898 (10.1)	Reference
Vaccinated with ChAdOx1 nCoV-19 vaccine ≥21 days before testing positive	3,424	196 (5.7)	0.52 (0.43–0.62)
Vaccinated with BNT162b2 vaccine ≥21 days before testing positive	5,939	371 (6.2)	0.54 (0.47–0.62)

\* Odds ratios were adjusted for the age and sex of the index patient and their household contact, geographic region, calendar week of the index case, and an index of multiple deprivation and household type and size. CI denotes confidence interval, and Covid-19 coronavirus disease 2019.

Figure S1. Odds ratios for contacts becoming a secondary case according to vaccination timing of the index case (days before testing positive)



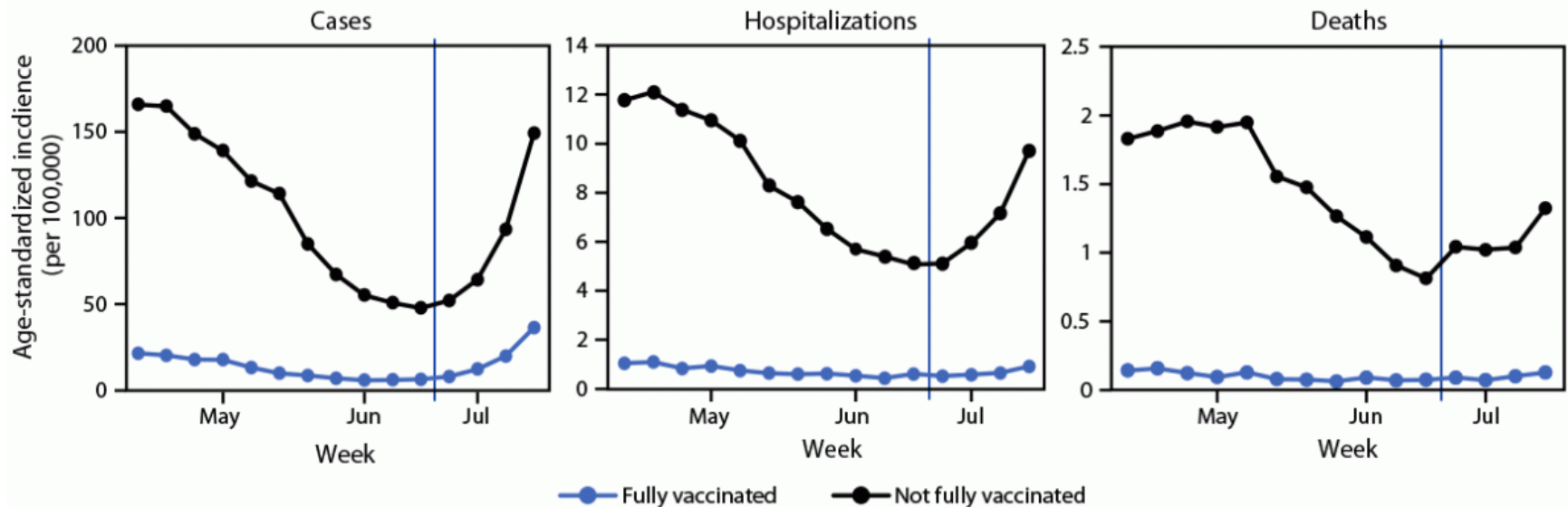
# Monitoring Incidence of COVID-19 Cases, Hospitalizations, and Deaths, by Vaccination Status — 13 U.S. Jurisdictions, April 4–July 17, 2021

## Efficacité de la vaccination aux USA

Incidence des cas, hospitalisations et décès chez les personnes vaccinées et non vaccinées

615 454 cas entre avril à juillet 2021

Scobie et al



Merci pour votre écoute