

COVIDSurg Collaborative

En internasjonal multisenter tversnittstudie for å analysere COVID
epidemiens effekt på kirurgiske pasienter

Knut Magne Augestad MD, PhD



Aktuell case

Mann

Coloskopert m funn av

Ca rectisigmoid T3N0M0

Lav fremre reseksjon planlagt

Positiv SARS-COV PCR

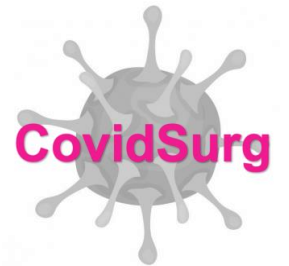
Når skal pasienten opereres for sin rektum cancer ?

Metode COVIDSurg studien



1. EuroSurg Collaborative
2. GlobalSurg Collaborative
3. COVIDSurg Collaborative

Alle samarbeidspartnere (collaborators) vil bli anerkjent via medforfatterskap



CovidSurg – Study Protocol

Outcomes of Surgery in COVID-19 infection: international cohort study

International | Multicentre | Observational Cohort | REDCap | Study period until September 30th 2020 | Collaborative Authorship

Outcomes

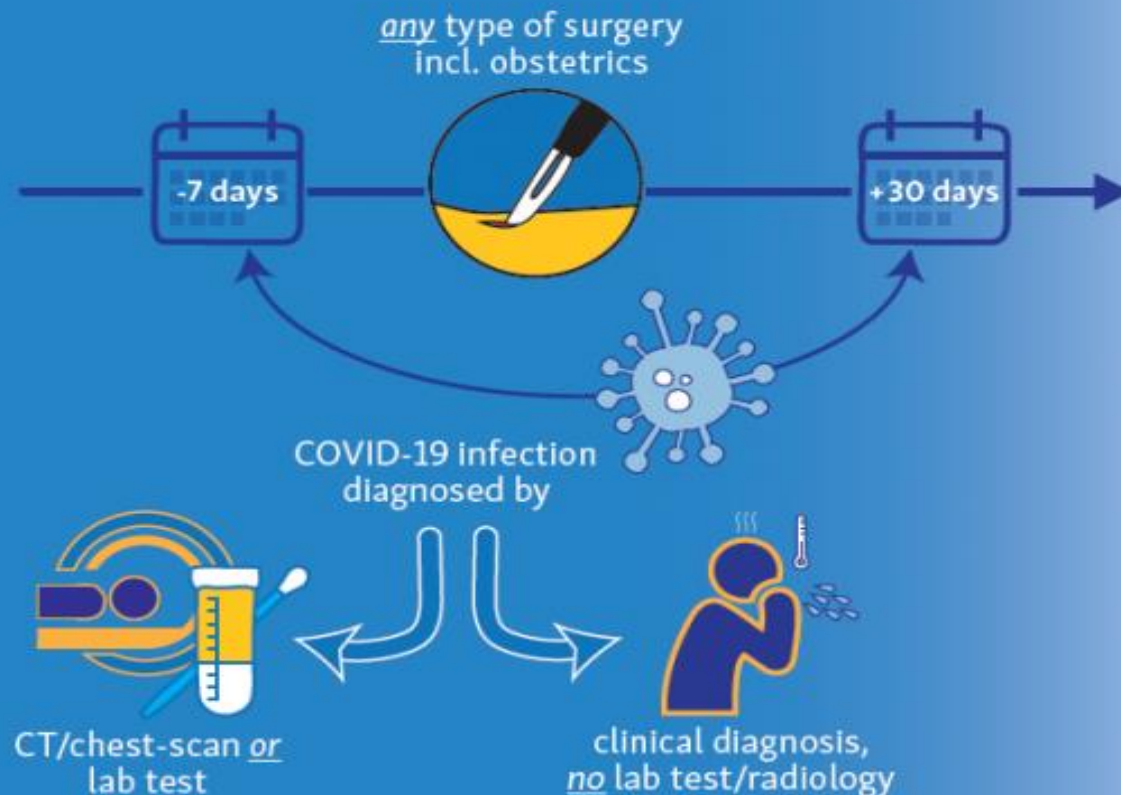


1° • 30-d mortality rate after surgery in COVID-19 positive patients

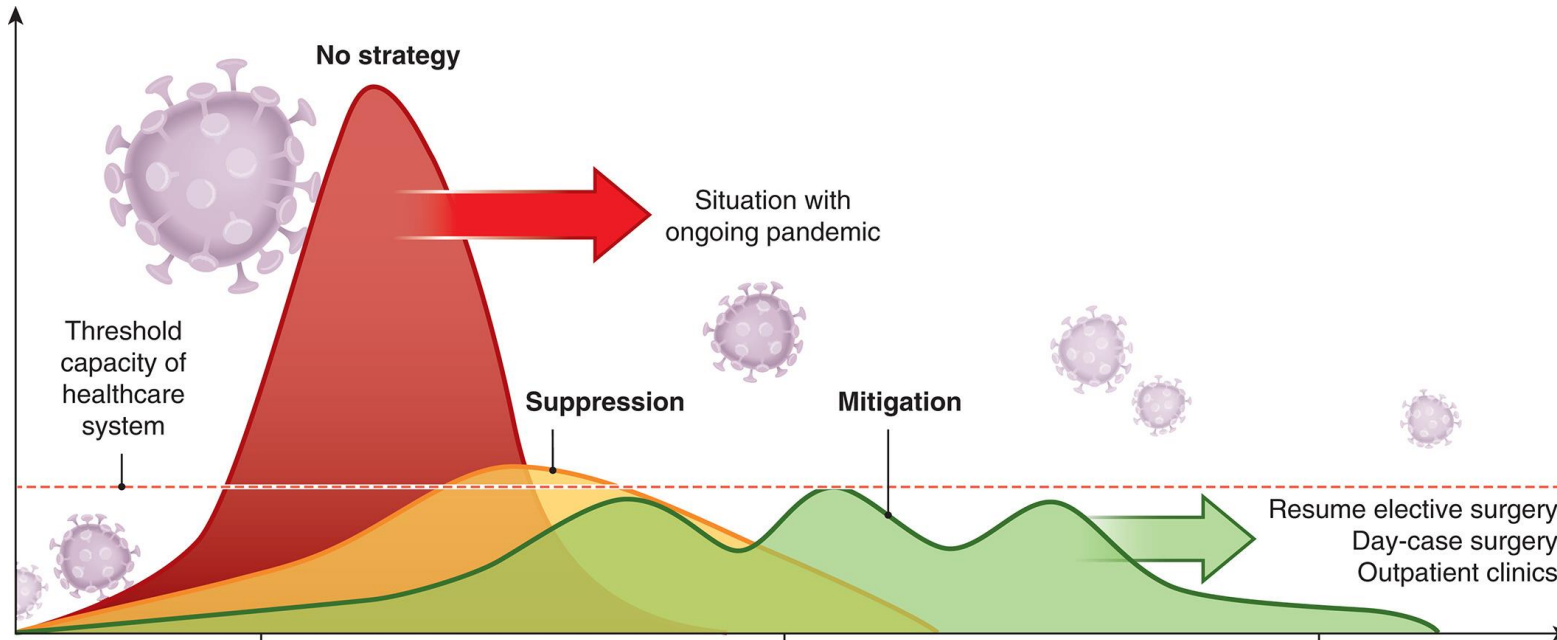
2° • 7-d mortality
• 30-d reoperation
• ICU admission
• respiratory failure
• ARDS
• sepsis

} postoperative

Patient inclusion



Immediate and long-term impact of the COVID-19 pandemic on delivery of surgical services



Forskningspørsmål:

1. Kansellinger av kirurgi: hvor mange ?
2. Mortalitet og lungekomplikasjoner:
Hvor stor risiko v kirurgi?
3. Organisering av kirurgiske avdelinger
«Kalde» versus «varme» forløp
4. Bør man vaksinere elektive pasienter?
5. Hvor lenge må man vente etter en COVID infeksjon ?

Elective surgery cancellations due to the COVID-19 pandemic: global predictive modelling to inform surgical recovery plans

COVIDSurg Collaborative*

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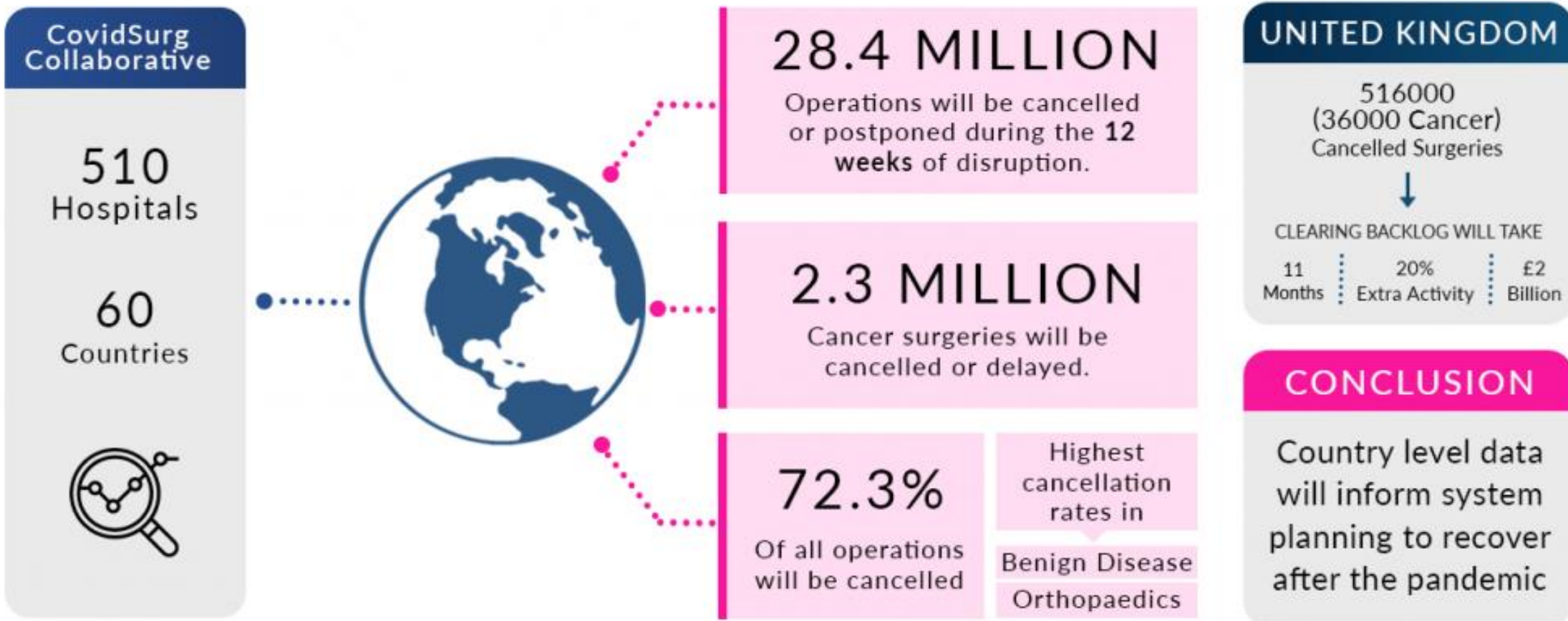
Background: The COVID-19 pandemic has disrupted routine hospital services globally. This study estimated the total number of adult elective operations that would be cancelled worldwide during the 12 weeks of peak disruption due to COVID-19.

Methods: A global expert response study was conducted to elicit projections for the proportion of elective surgery that would be cancelled or postponed during the 12 weeks of peak disruption. A Bayesian β -regression model was used to estimate 12-week cancellation rates for 190 countries. Elective surgical case-mix data, stratified by specialty and indication (surgery for cancer *versus* benign disease), were determined. This case mix was applied to country-level surgical volumes. The 12-week cancellation rates were then applied to these figures to calculate the total number of cancelled operations.

Results: The best estimate was that 28 404 603 operations would be cancelled or postponed during the peak 12 weeks of disruption due to COVID-19 (2 367 050 operations per week). Most would be operations for benign disease (90.2 per cent, 25 638 922 of 28 404 603). The overall 12-week cancellation rate would be 72.3 per cent. Globally, 81.7 per cent of operations for benign conditions (25 638 922 of 31 378 062), 37.7 per cent of cancer operations (2 324 070 of 6 162 311) and 25.4 per cent of elective caesarean sections (441 611 of 1 735 483) would be cancelled or postponed. If countries increased their normal surgical volume by 20 per cent after the pandemic, it would take a median of 45 weeks to clear the backlog of



Elective surgery cancellations due to the COVID-19 pandemic: global predictive modelling to inform surgical recovery plans





STORE ETTERSLEP: Ortopediske inngrep vil bli kansellert hyppigst, med estimerte 6,3 millioner kanselleringer i løpet av en 12-ukersperiode. Det er også beregnet at 2,3 millioner kreftkirurgiske inngrep blir kansellert. Illustrasjonsfoto.

Foto: Vidar Sandnes

Studie: Over 60.000 operasjoner kansellert i Norge

Covid-19-pandemien medfører 28 millioner avlyste kirurgiske inngrep globalt og gir også store ringvirkninger ved norske sykehus.

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"At 6 months after symptom onset, fatigue or muscle weakness and sleep difficulties were the main symptoms of patients who had recovered from COVID-19."

Mortality and pulmonary complications in patients undergoing surgery with perioperative SARS-CoV-2 infection: an international cohort study

COVIDSurg Collaborative*

Summary

Background The impact of severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) on postoperative recovery needs to be understood to inform clinical decision making during and after the COVID-19 pandemic. This study reports 30-day mortality and pulmonary complication rates in patients with perioperative SARS-CoV-2 infection.

Methods This international, multicentre, cohort study at 235 hospitals in 24 countries included all patients undergoing surgery who had SARS-CoV-2 infection confirmed within 7 days before or 30 days after surgery. The primary outcome measure was 30-day postoperative mortality and was assessed in all enrolled patients. The main secondary outcome measure was pulmonary complications, defined as pneumonia, acute respiratory distress syndrome, or unexpected postoperative ventilation.

Findings This analysis includes 1128 patients who had surgery between Jan 1 and March 31, 2020, of whom 835 (74.0%) had emergency surgery and 280 (24.8%) had elective surgery. SARS-CoV-2 infection was confirmed preoperatively in 294 (26.1%) patients. 30-day mortality was 23.8% (268 of 1128). Pulmonary complications occurred in 577 (51.2%) of 1128 patients; 30-day mortality in these patients was 38.0% (219 of 577), accounting for 81.7% (219 of 268) of all deaths. In adjusted analyses, 30-day mortality was associated with male sex (odds ratio 1.75 [95% CI 1.28–2.40], $p < 0.0001$), age 70 years or older versus younger than 70 years (2.30 [1.65–3.22], $p < 0.0001$), American Society of Anesthesiologists grades 3–5 versus grades 1–2 (2.35 [1.57–3.53], $p < 0.0001$), malignant versus benign or obstetric diagnosis (1.55 [1.01–2.39], $p = 0.046$), emergency versus elective surgery (1.67 [1.06–2.63], $p = 0.026$), and major versus minor surgery (1.52 [1.01–2.31], $p = 0.047$).

Interpretation Postoperative pulmonary complications occur in half of patients with perioperative SARS-CoV-2 infection and are associated with high mortality. Thresholds for surgery during the COVID-19 pandemic should be higher than during normal practice, particularly in men aged 70 years and older. Consideration should be given for postponing non-urgent procedures and promoting non-operative treatment to delay or avoid the need for surgery.



Mortality and pulmonary complications in patients undergoing surgery with perioperative SARS-CoV-2 infection: **an international cohort study**



THE
LANCET

SARS-CoV-2 DIAGNOSIS



CT/chest-scan
or lab-test



Clinical
Diagnosis



24% Pre-op diagnosis

76% Post-op diagnosis

24%

30-day mortality

51%

Post-op pulmonary complications
(Pneumonia, ARDS, unexpected post-op ventilation)

38%

30-day
mortality

83%

of all
deaths

RISK FACTORS FOR MORTALITY



Male Sex



Age \geq 70



ASA grade III-V



Cancer
Diagnosis



Emergency
Surgery



Major
Surgery

CONCLUSION

Post-op complications and mortality is higher than in the pre-COVID era. Surgery should be postponed, and non-operative management should be used whenever possible.



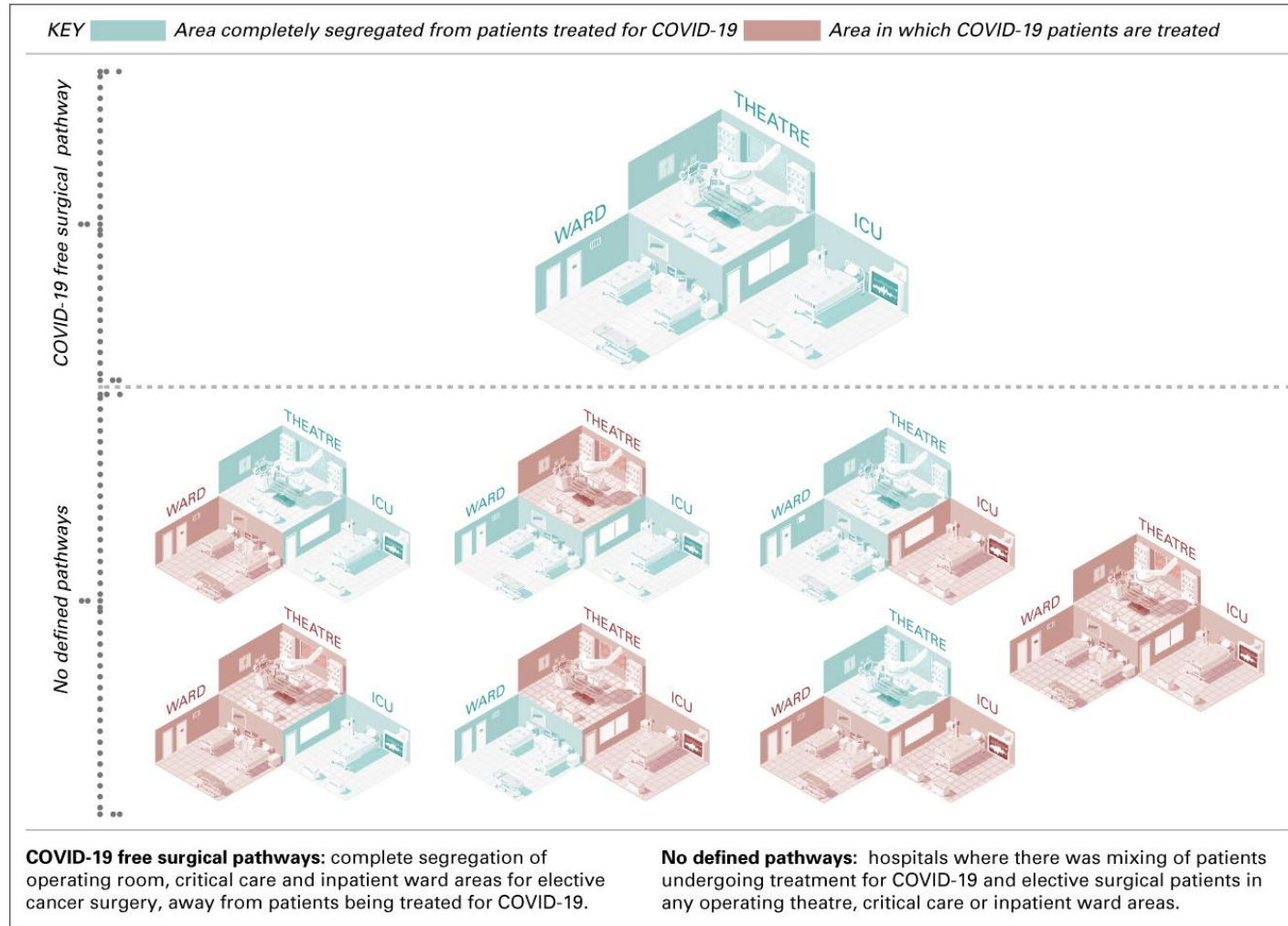


Table 4 Adjusted differences in 30-day mortality rate between patients with and without postoperative SARS-CoV-2 infection

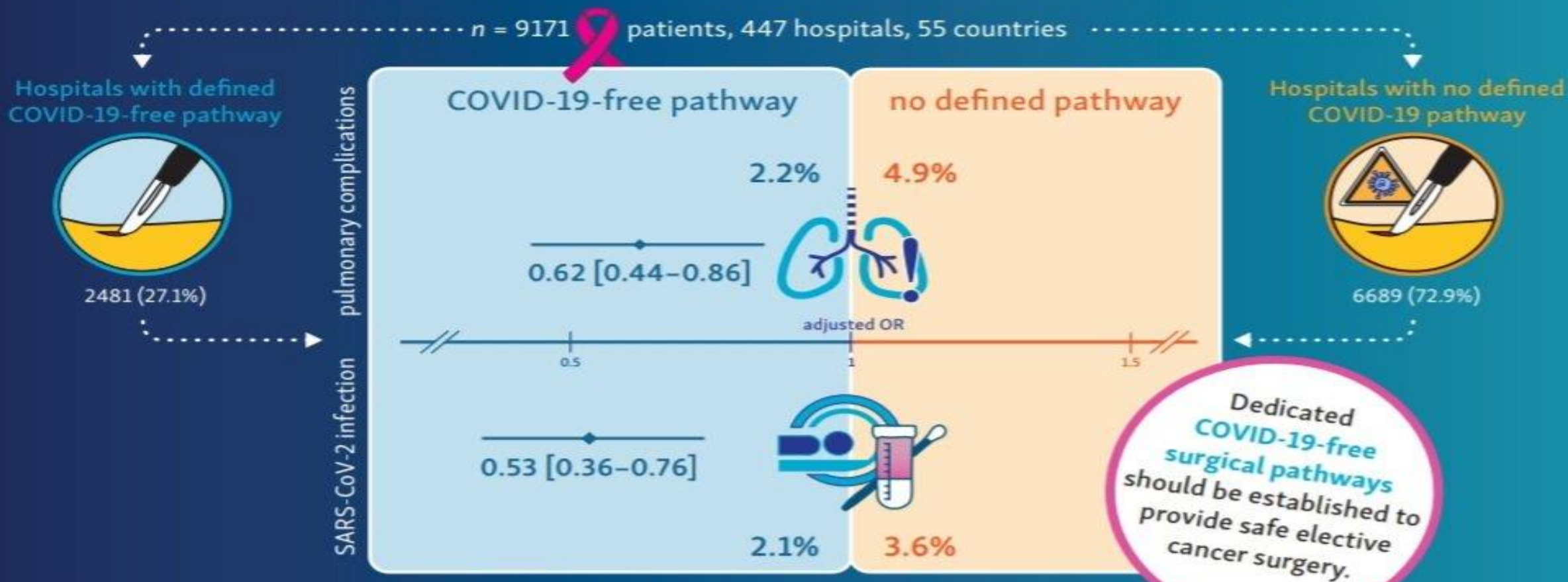
	Adjusted difference in 30-day mortality rate (%)
Age 18–49 years	
Elective non-cancer surgery	0.77 (0, 2.00)
Elective cancer surgery	2.63 (0, 6.60)
Age 50–69 years	
Elective non-cancer surgery	7.26 (3.38, 11.14)
Elective cancer surgery	11.55 (6.08, 17.02)
Age \geq 70 years	
Elective non-cancer surgery	10.46 (5.56, 15.36)
Elective cancer surgery	15.84 (9.30, 22.39)

Values in parentheses are 95 per cent confidence intervals; if the lower bound of the 95 per cent confidence interval included negative values, this was reported as 0 per cent. Adjusted differences were calculated using average marginal effects, based on multilevel models (including country and hospital effects) that were adjusted for age, sex, ASA physical status grade, indication for operation (cancer *versus* non-cancer surgery), and grade of surgery (minor *versus* major).

Elective Cancer Surgery in COVID-19-Free Surgical Pathways During the SARS-CoV-2 Pandemic

COVIDSurg-Cancer

International | Multicentre | Observational Cohort | Operated Patients w/o pre-Op SARS-CoV-2 | Early Pandemic until 19 April 2020



SARS-CoV-2 vaccination modelling for safe surgery to save lives: data from an international prospective cohort study


COVIDSurg Collaborative, GlobalSurg Collaborative*

Members of the COVIDSurg Collaborative and GlobalSurg Collaborative are co-authors of this study and are listed under the heading Collaborators.

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Abstract

Background: Preoperative SARS-CoV-2 vaccination could support safer elective surgery. Vaccine numbers are limited so this study aimed to inform their prioritization by modelling.



Methods: The primary outcome was the number needed to vaccinate (NNV) to prevent one COVID-19-related death in 1 year. NNVs were based on postoperative SARS-CoV-2 rates and mortality in an international cohort study (surgical patients), and community SARS-CoV-2 incidence and case fatality data (general population). NNV estimates were stratified by age (18–49, 50–69, 70 or more years) and type of surgery. Best- and worst-case scenarios were used to describe uncertainty.

Results: NNVs were more favourable in surgical patients than the general population. The most favourable NNVs were in patients aged 70 years or more needing cancer surgery (351; best case 196, worst case 816) or non-cancer surgery (733; best case 407, worst case 1664). Both exceeded the NNV in the general population (1840; best case 1196, worst case 3066). NNVs for surgical patients remained favourable at a range of SARS-CoV-2 incidence rates in sensitivity analysis modelling. Globally, prioritizing preoperative vaccination of patients needing elective surgery ahead of the general population could prevent an additional 58 687 (best case 115 007, worst case 20 177) COVID-19-related deaths in 1 year.

Conclusion: As global roll out of SARS-CoV-2 vaccination proceeds, patients needing elective surgery should be prioritized ahead of the general population.

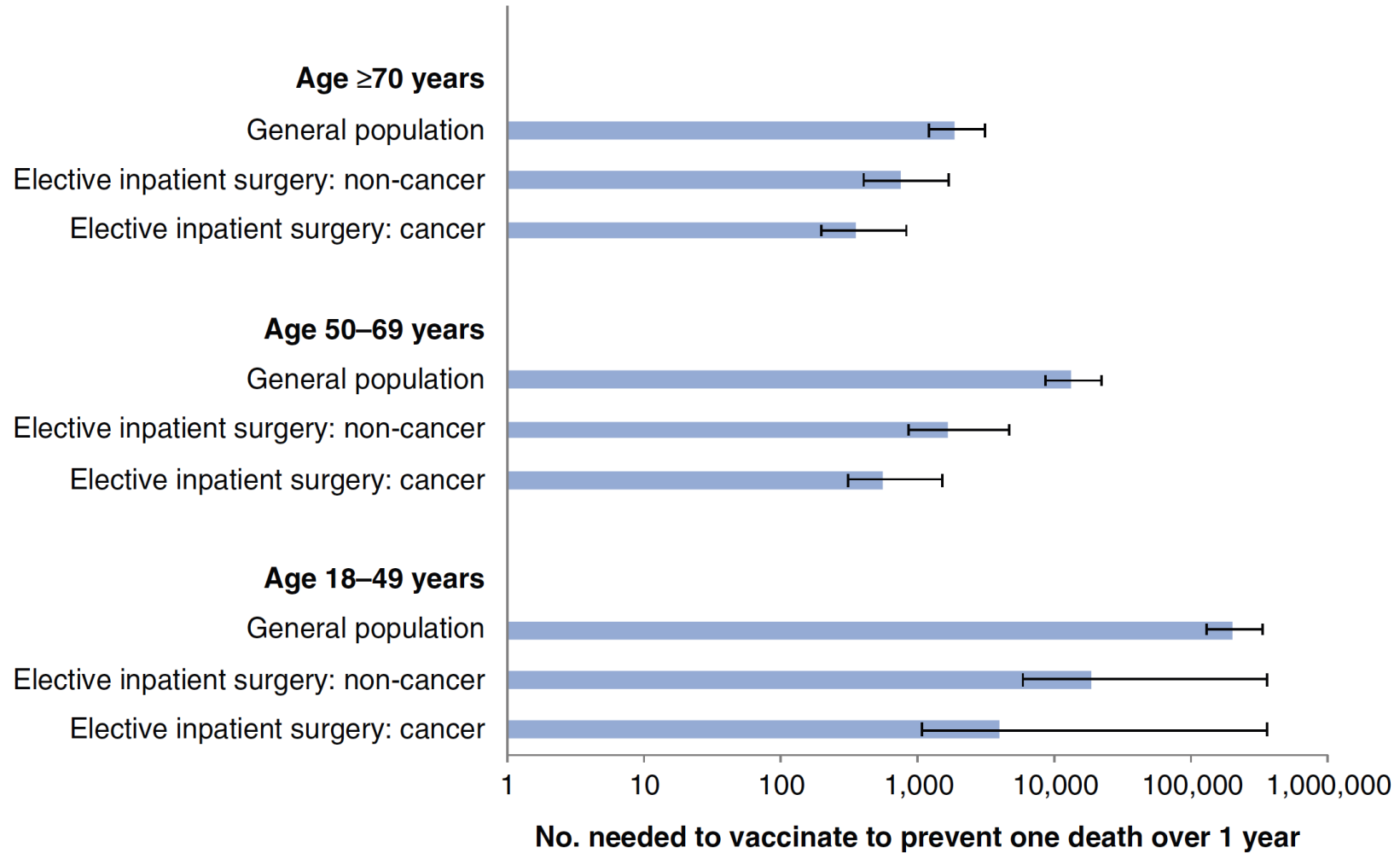


Fig. 1 Global number needed to vaccinate to prevent one COVID-19-related death over 1 year

Number needed to vaccinate estimates for the general population are based on global SARS-CoV-2 infection rates (26.48 per million people per day); estimates assume that this remains steady for a full year. For surgical patients, estimates are based on preoperative vaccination. Error bars indicate estimates for best- and worst-case scenarios. Data are presented on a logarithmic scale.

Original Article

Timing of surgery following SARS-CoV-2 infection: an international prospective cohort study

COVIDSurg Collaborative* and **GlobalSurg Collaborative***

NIHR Global Health Research Unit on Global Surgery, Birmingham, UK

140 000 pasienter

116 land

Benign

Kreft

Traume

Gyn

Major surgery: ca 60%

Minor surgery: ca 40%

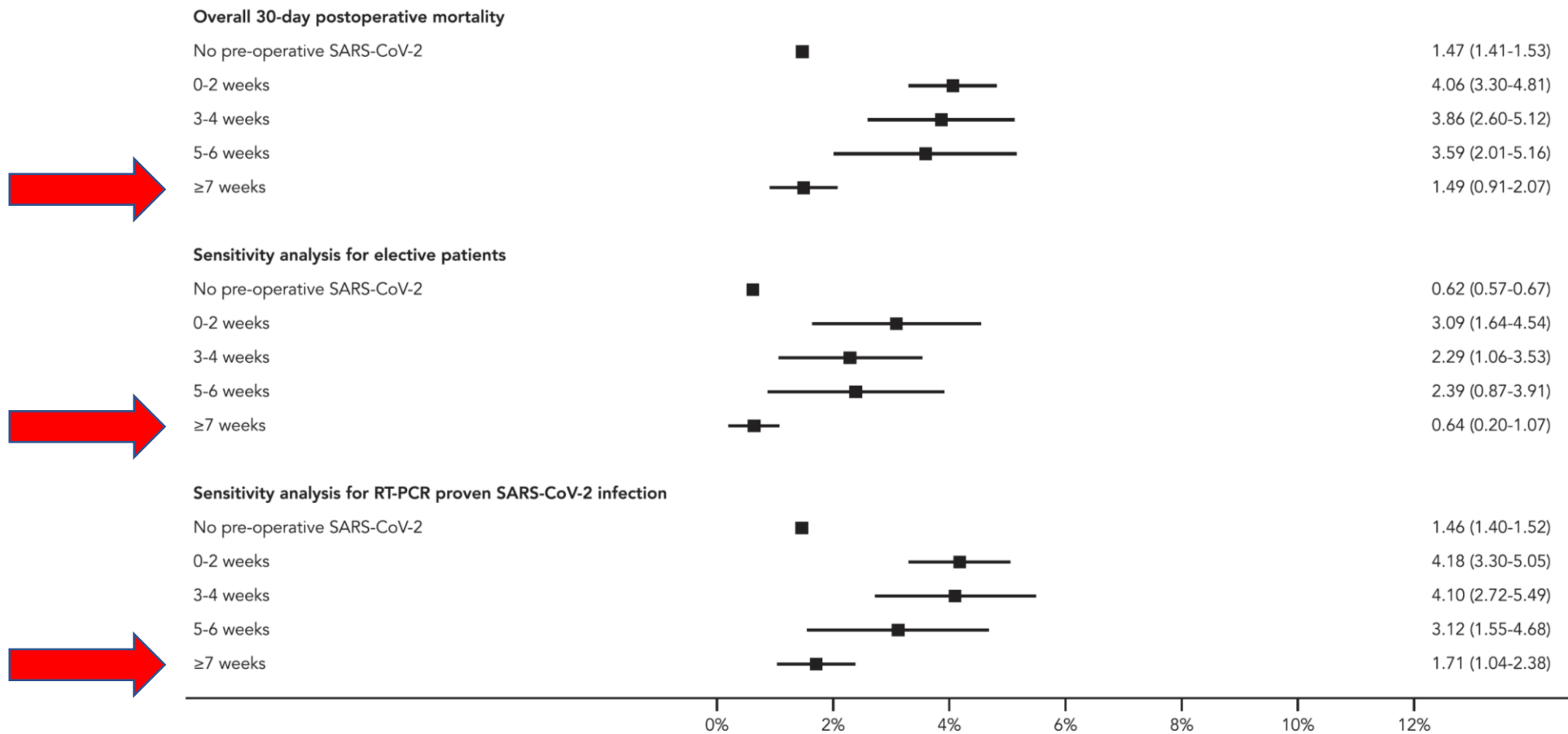
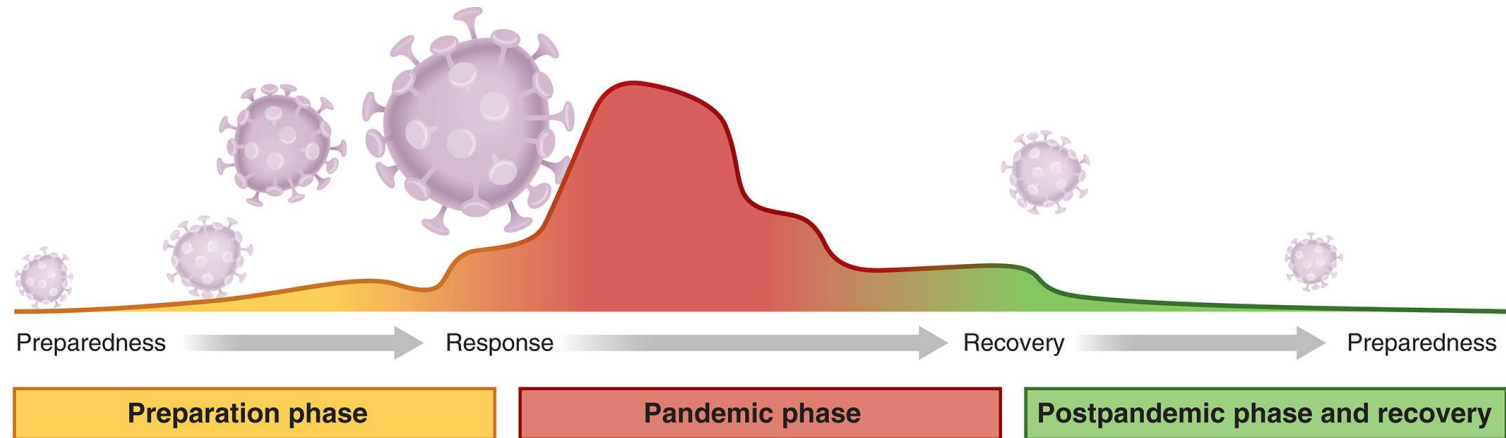


Figure 1 Overall adjusted 30-day postoperative mortality from main analysis and sensitivity analyses for patients having elective surgery and those patients with a reverse transcription polymerase chain reaction (RT-PCR) nasopharyngeal swab positive result for SARS-CoV-2. 'No pre-operative SARS-CoV-2' refers to patients without a diagnosis of SARS-CoV-2 infection.

Immediate and long-term impact of the COVID-19 pandemic on delivery of surgical services



1. Kanseller benign elektiv kirurgi
2. Varme vs. kalde pasientforløp
3. Reorganiser kirurgiske tjenester
 1. ICU
 2. Sengeposter
 3. Dagkirurgi
4. Test kapasitet
 1. Nasophaynx/PCR
 2. CT thorax/radiologi
5. Adekvat beskyttelse av medarbeidere/PPE

1. Akutt kirurgi
2. Traume
3. Elektiv kreft kirurgi
4. Transplantasjon

Ta igjen etterslep !!
Prioriter benigne tilstander som har ventet lenge og kan forverres

Hvor lenge bør pasienten vår vente før man opererer han ?



..... *Talent wins games, but teamwork and intelligence win championships*

– *Michael Jordan*



COVID-19 HOT AND COLD SURGICAL UNITS

The COVIDSurg Cancer study assessed 30-day post-operative COVID-19 infection rate among patients planned for curative cancer surgery. It quantified the rates of post-operative pulmonary complications and mortality in 'hot' versus 'cold' surgical units.'

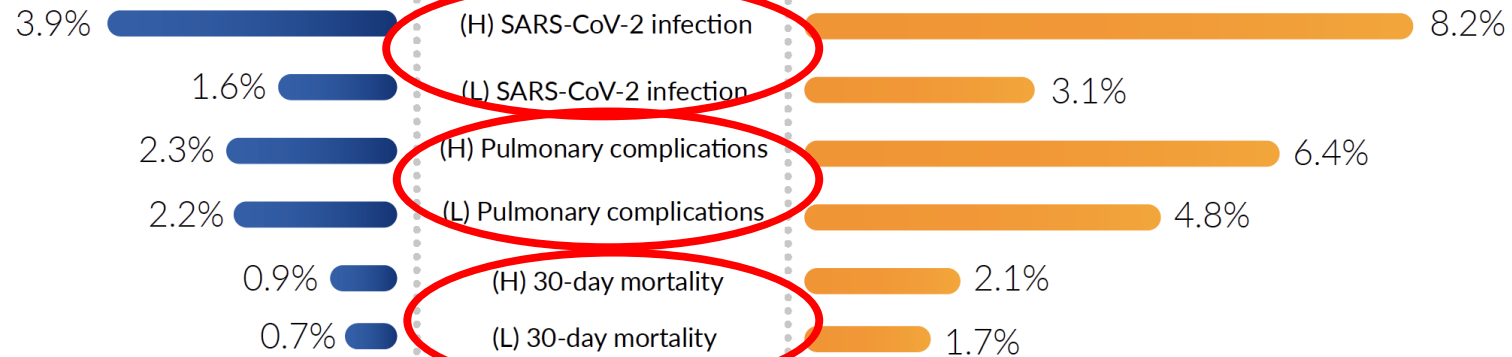
COLD UNITS

COVID-19 free surgical pathways (either standalone hospitals or separate pathways within hospitals)



HOT UNITS

No designated COVID-19 free surgical pathways



(H) = High community SARS-CoV-2 incidence area | (L) = Low community SARS-CoV-2 incidence area

IMPACT:

- During SARS-CoV-2 outbreaks, outcomes were better in cold units.
- The benefit of cold surgical units was greatest where populations SARS-CoV-2 rates were high
- There is a selection bias, with higher risk patients undergoing surgery in hot units. However this effect was seen despite adjustment for patient, disease, and operation factors in multi-variable models.
- During COVID-19 outbreaks, elective cancer surgery appears safer in cold surgical units. The setup of these units is discussed in this report.

Delaying Surgery For Patients With a Previous SARS-CoV-2 Infection

From COVIDSurg-Cancer towards SURG-WEEK

Pilot Data | Elective Cancer Operations (from COVIDSurg-Cancer) |

Proven Previous SARS-CoV-2 Infection

COVIDSurg-Cancer

SARS-CoV-2 positive swab



>4 weeks



2-4 weeks



1-2 weeks

date of surgery



pulmonary complications

0.0%

11.7%

18.5%



mortality

0.0%

3.4%

7.7%

Early data suggest delaying surgery for at least 4 weeks after positive SARS-CoV-2 swab

Better evidence is urgently needed to inform safe practice.

SURG-WEEK

globalsurg.org/surgweek/

ALL PATIENTS
ONE WEEK DATA COLLECTION
OCTOBER 2020

5 KEY MESSAGES: DATA FROM THE COVIDSurg STUDIES

1



During the first COVID-19 peaks, more than 28 million operations have been cancelled worldwide.

2



Hospitals will need at least 12 months to clear the backlog resulting from delayed and postponed operations, although reduced capacity and new cases mean that it could take significantly longer.

3



COVID-19 around the time of surgery is associated with an aggressive phenotype that has a high mortality. Patients need careful selection for surgery and protection from the virus.

4



Outcomes from COVID-19 cold surgical units are better than those from hot surgical units. Cold elective surgical pathways are needed on a global scale.

5



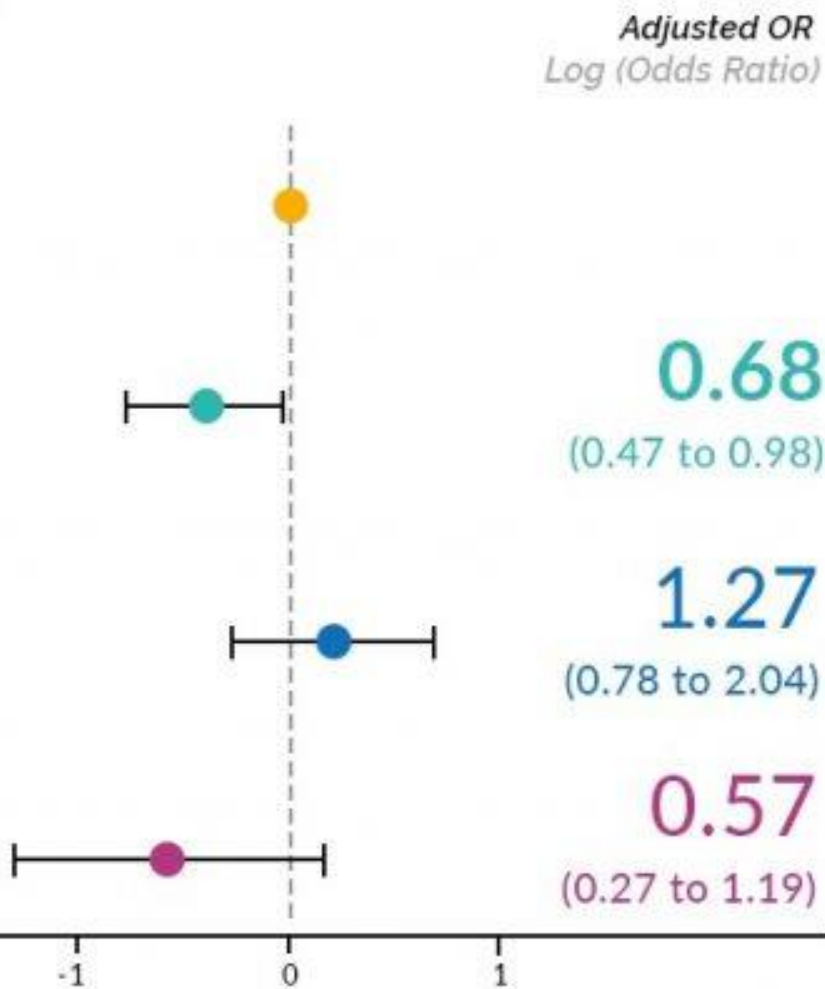
Proactive and flexible workforce planning will enable staffing of emergency and elective, hot and cold surgical units. This will be central to recovery.

- Vent 7 uker med elektiv kirurgi hvis COVID positiv
- Vaksinasjon: Pasienter som trenger elektiv kirurgi bør prioriteres før den generelle befolkning

Preoperative Nasopharyngeal Swab Testing and Postoperative Pulmonary Complications in Patients Undergoing Elective Surgery During the SARS-CoV-2 Pandemic | COVIDSurg Collaborative

International | Multi-centre | Observational cohort | 53 Countries | 432 Hospitals | n = 8784 Patients w/o pre-op SARS-CoV-2

Postoperative Pulmonary Complications rate



NNT

No. of patients who need to be swabbed to prevent one pulmonary complication

High risk area		Low risk area	
Major Surgery	18	Major Surgery	73
Minor Surgery	48	Minor Surgery	387

Swab testing was beneficial before major surgery and in high SARS-CoV-2 risk areas. There was no proven benefit of swab testing before minor surgery in low risk areas.