# DCCM COVID-19 Town Hall

April 29th, 2020

# Welcome/Ground Rules

- Welcome
- Webinar Format
  - Host and panelists
  - Audience participation/Chat

# Agenda

- COVID-19 Dashboard
- Provincial CCSCN Update
- Sedation management and conservation during COVID-19 pandemic
- Questions

# COVID-19 Dashboard

Dan Niven

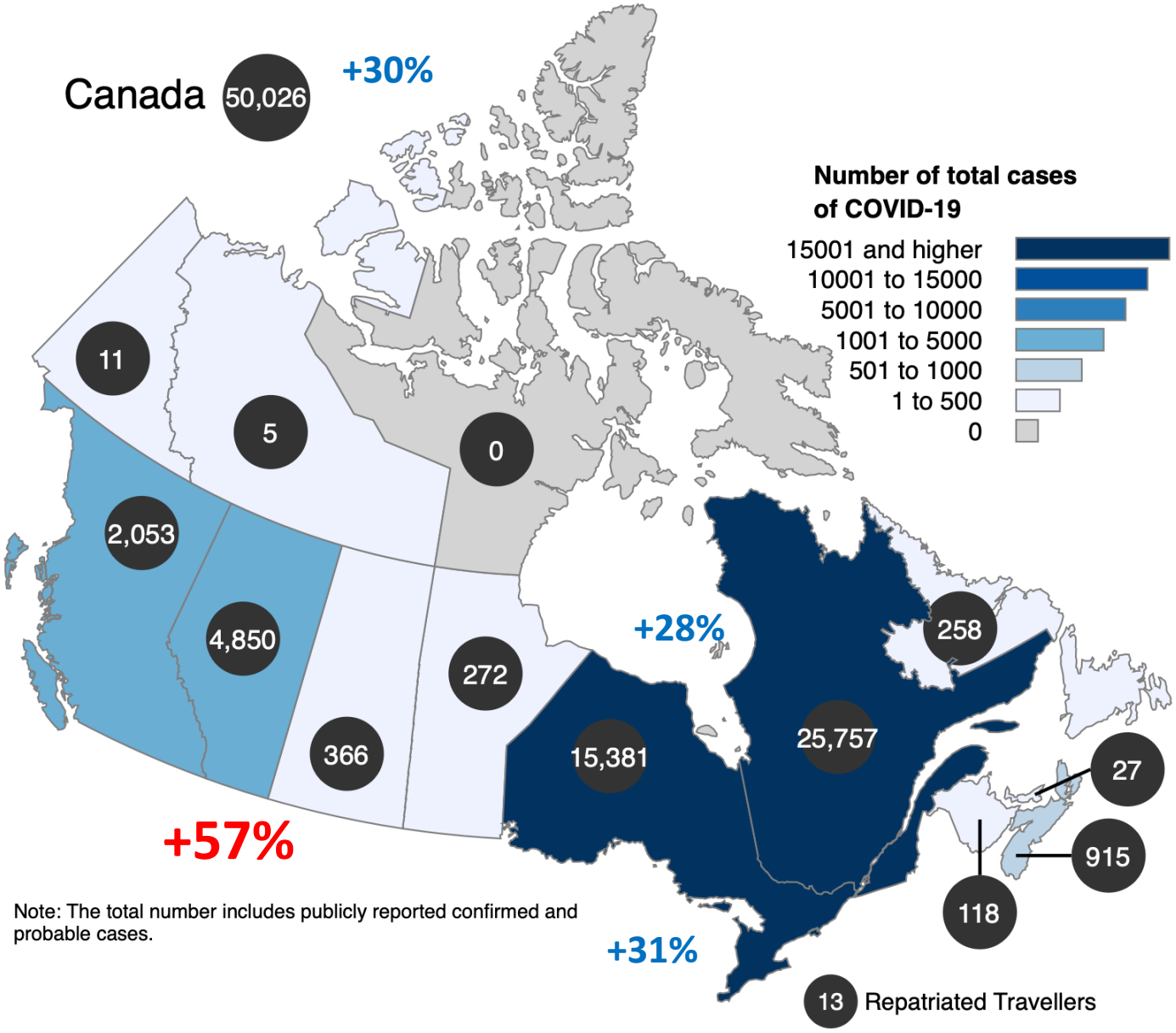
Sources of Information up to April 14:

https://www.canada.ca/en/public-health/services/diseases/2019-novel-coronavirus-infection.html#a1

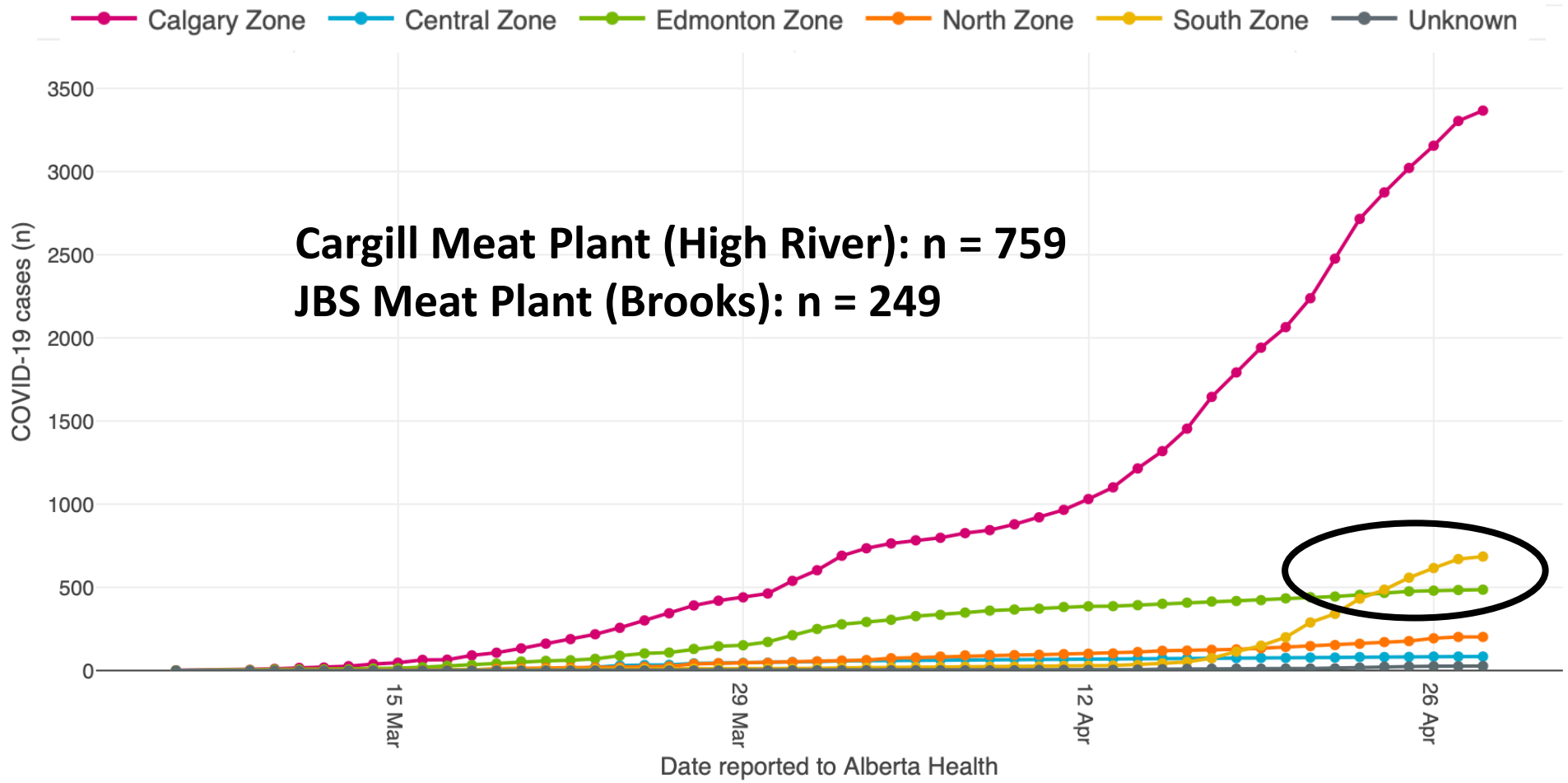
https://www.alberta.ca/covid-19-alberta-data.aspx

https://www.alberta.ca/assets/documents/covid-19-case-modelling-projection.pdf

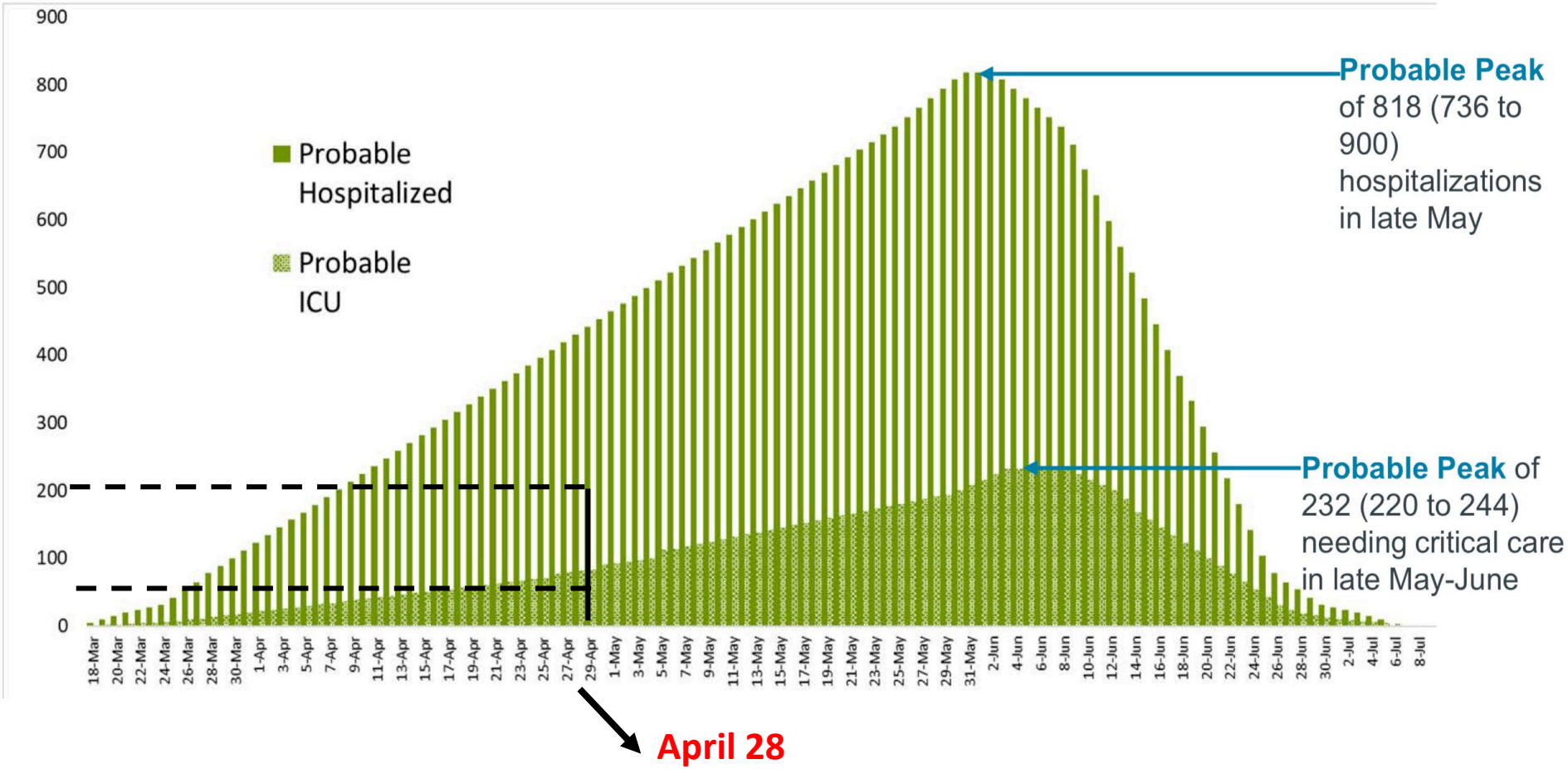
# APRIL 28


Canada 50,026
+30%
Number of total cases of COVID-19
15001 and higher
10001 to 15000
5001 to 10000
1001 to 5000
501 to 1000
1 to 500
0
11
5
0
2,053
4,850
272
366
+28%
258
15,381
25,757
27
915
118
+57%
+31%
13 Repatriated Travellers
Note: The total number includes publicly reported confirmed and probable cases.

# Alberta – Large Increase in CZ, SZ



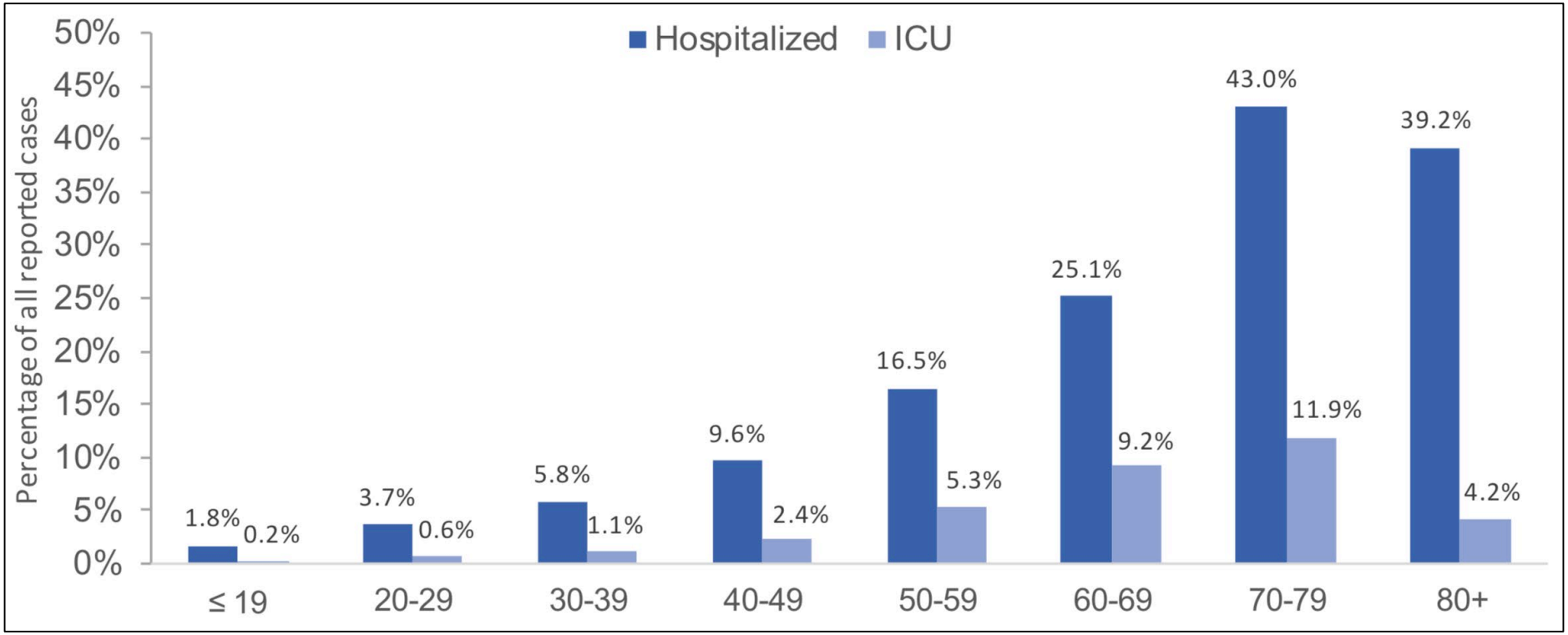
# April 28 Data Mapped to April 8 Probable Scenario Model



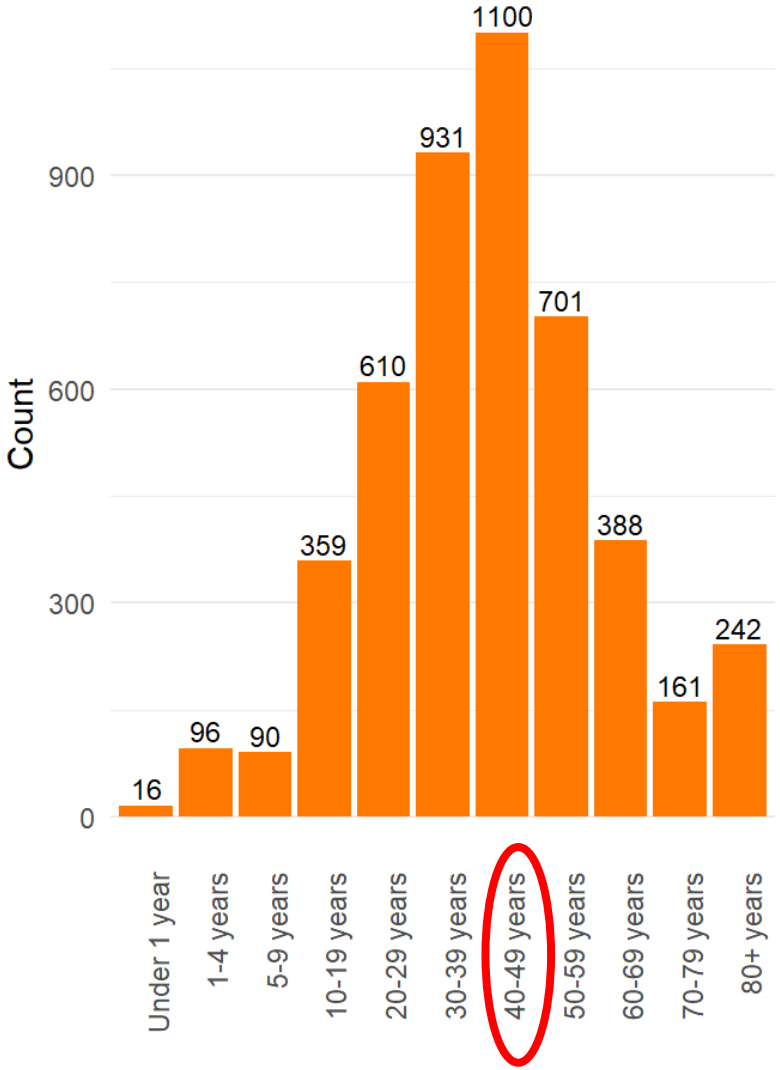
# COVID-19 – A Comparison Across Regions

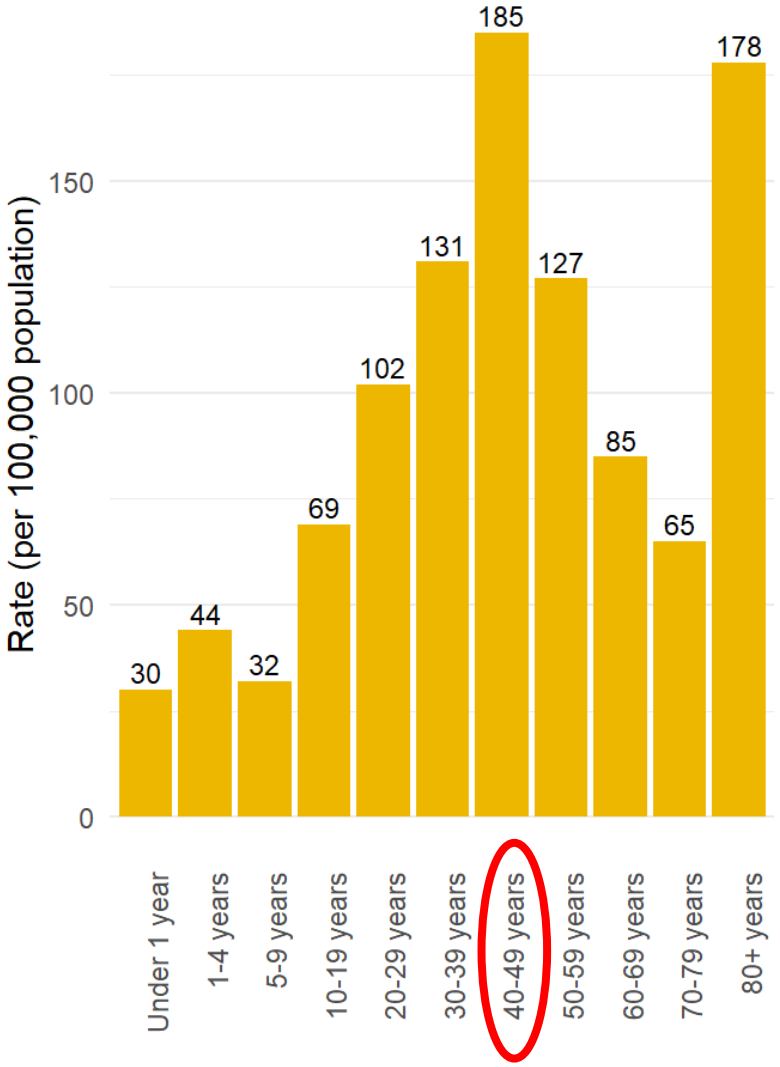
| Geographical Region | Infection rate (per 100,000) | Hospitalizations (per 100 infections) | ICU admission (per 100 infections) |
|---|---|---|---|
| Wuhan, China (peak) | ? | 10% | 5% |
| Italy – Lombardy region | 617 | ? | 12% |
| New York | 1,036 to 2,406 | 25% | 14% ** |
| Canada | 129 | 17% * | 4% * |
| **Alberta** | **102** | **4.5%** | **1%** |
| Ontario | 105 | 11% | 3% |
| Quebec | 293 | 6% | 1% |

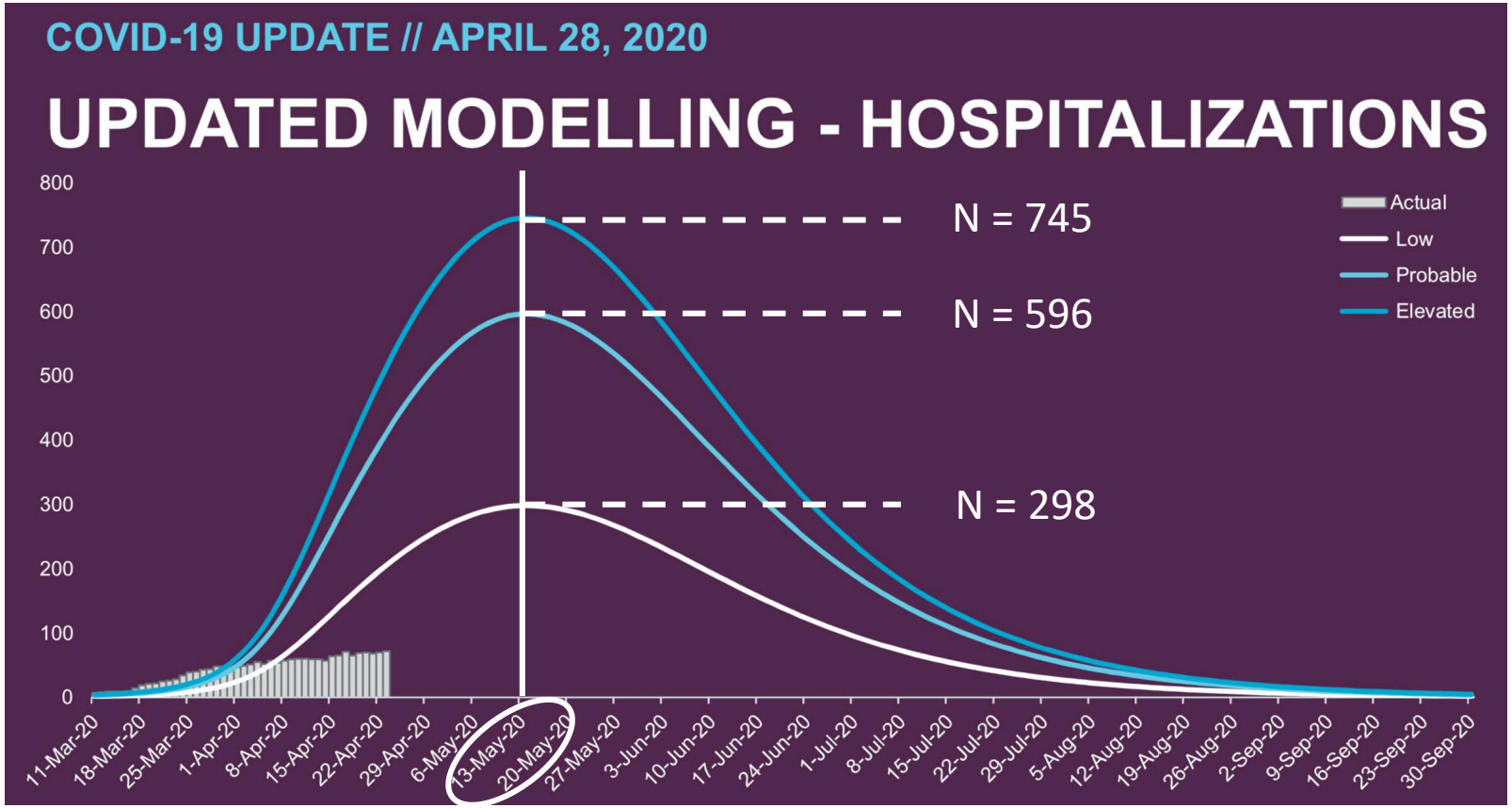
# Hospital/ICU Admissions Depend on Age
## (Canadian Data)



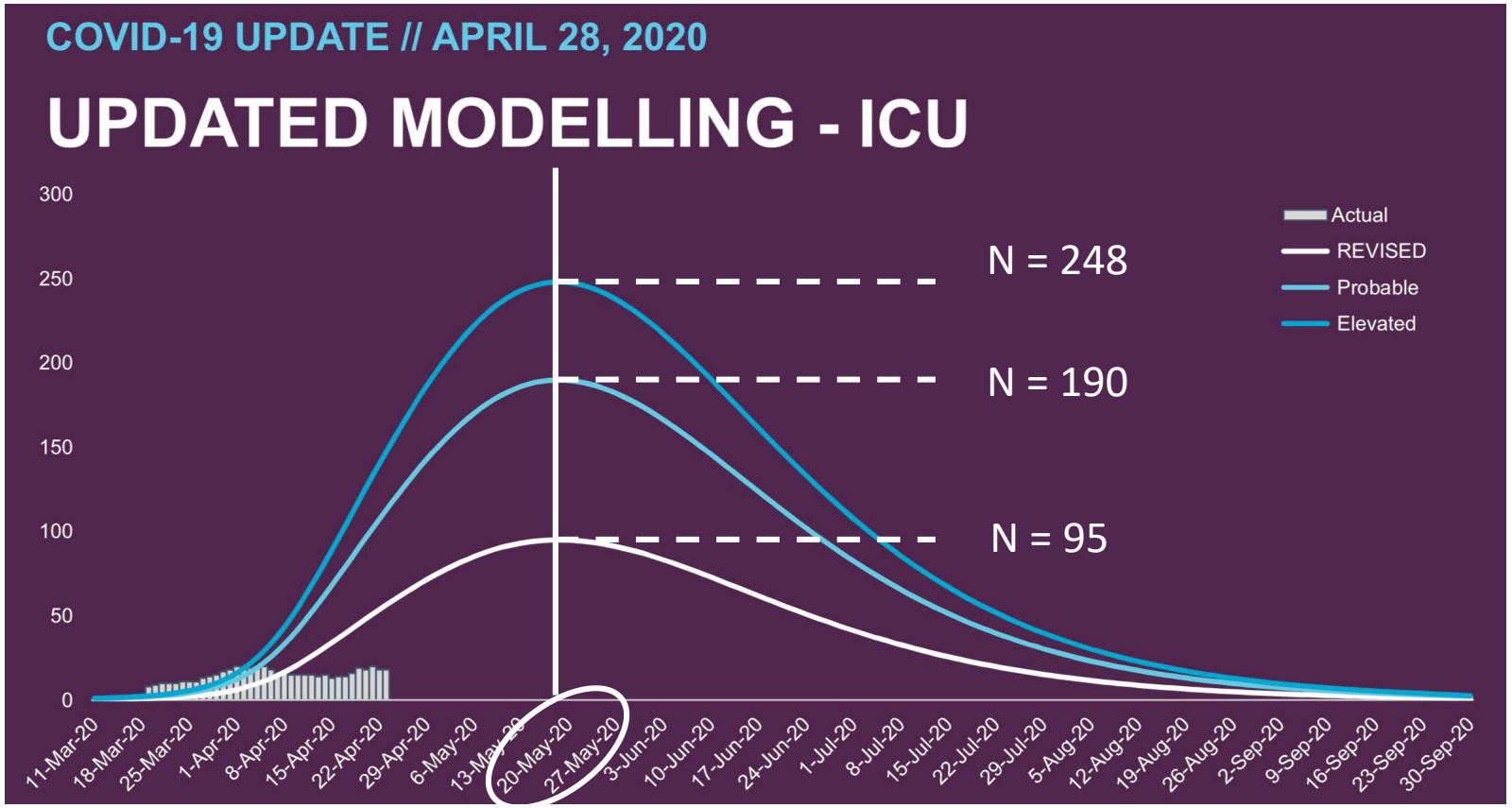
# Younger Population Keeping Alberta COVID Hospitalizations on Simmer?






- **Actual: n = 82 currently in-hospital**
- **Low:** based on **actual** 4.5% hospitalization rate
- **Probable:** assume current effects of physical distancing and 9% hospitalization rate
- **Elevated:** physical distancing less effective and 9% hospitalization rate




- **Actual: n = 21 currently in ICUs**
- **Low:** based on **actual** 4.5% hospitalization rate and 1% ICU admission rate
- **Probable:** assume 9% hospitalization rate and 2% ICU admission rate
- **Elevated:** physical distancing less effective, 9% hospitalization rate, 2% ICU admission

# April 28 Models and COVID ICU Admissions in Calgary Zone

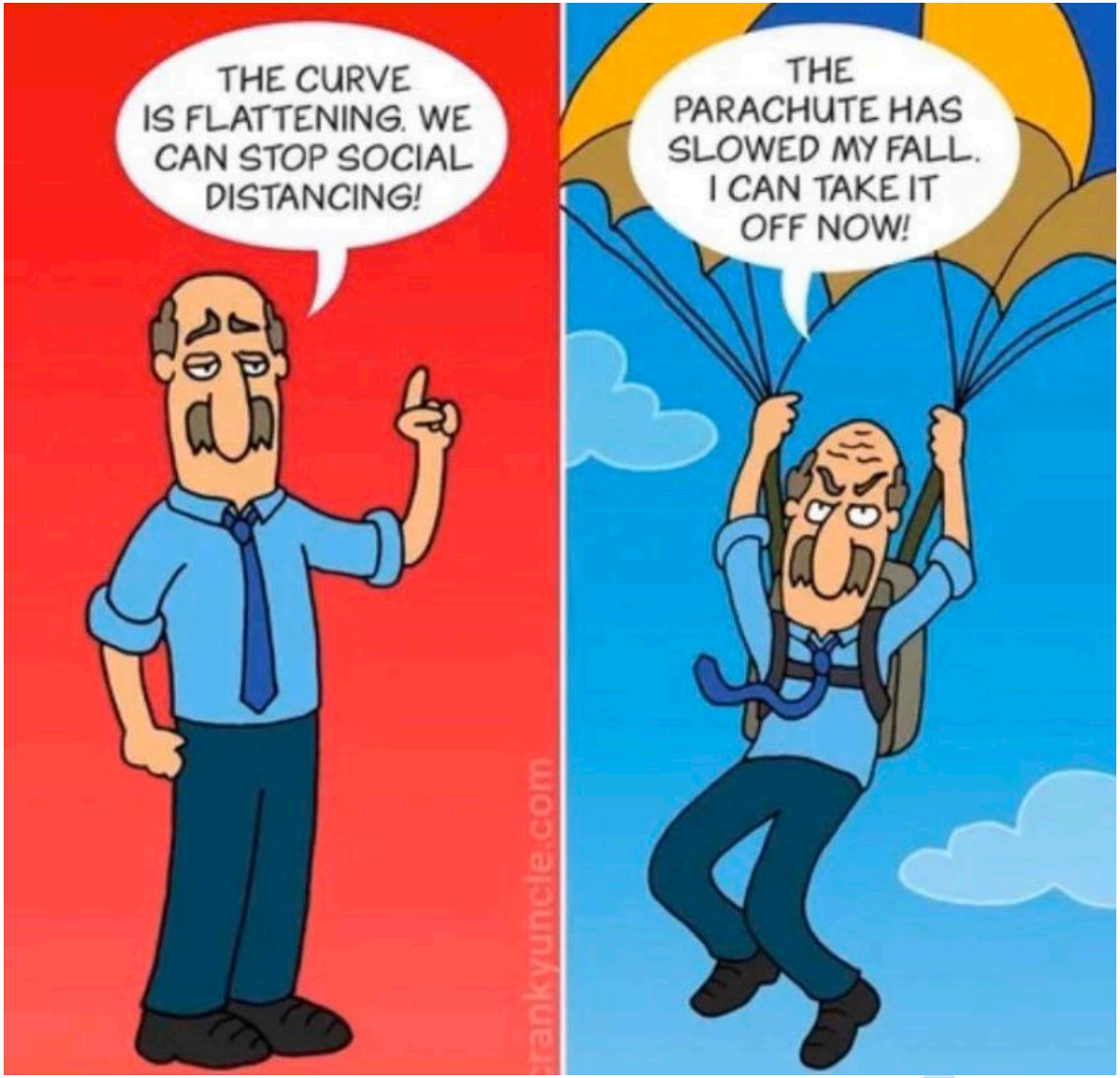
| Model | Timing of Peak | TOTAL COVID ICU Admits at Peak | Projected TOTAL COVID ICU Admissions in Calgary (70% of total) |
|---|---|---|---|
| Low | Mid-to-late May | 95 | **66 (Stage 1)** |
| Probable | Mid-to-late May | 190 | **133 (Stage 2)** |
| Elevated | Mid-to-late May | 248 | **173 (Stage 3)** |

# Dashboard – Take Home Points

- **Physical distancing** in Alberta and Canada more broadly is flattening the curve and **reducing the burden of COVID-19**
  - Lower population infection rate per 100,000

- **Alberta has seen a large increase in COVID-19 cases** over the past 2 weeks – driven by **Calgary and South Zones**
  - Demonstrates the power of this virus to spread quickly

- **Burden of COVID-19** on acute care is **HIGHLY dependent upon AGE of infected patients**
  - Likely explains lower hospital/ICU admission rates than predicted in Alberta


THE CURVE IS FLATTENING. WE CAN STOP SOCIAL DISTANCING!
THE PARACHUTE HAS SLOWED MY FALL. I CAN TAKE IT OFF NOW!
crankyuncle.com

# Critical Care SCN

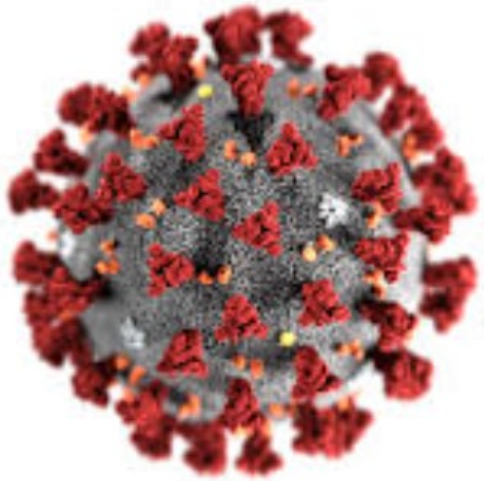
# COVID Update

Alberta Health Services
Inspiring solutions. Together.
Strategic Clinical Networks™

# PFA

## Psychological First Aid for Critical Care

# The impact of COVD19



Much like our immune systems our psychosocial support structures are not prepared for the effects of the pandemic.

Psychological impact of the pandemic in China.

General population.

- 53.8% of respondents rated the psychological impact of the outbreak as moderate or severe
- 16.5% reported moderate to severe depressive symptoms
- 28.8% reported moderate to severe anxiety symptoms
- 8.1% reported moderate to severe stress levels.

# Background on PFA

- ✓ Designed to reduce PTSD by Dep't of Veteran Affairs (2006)
- ✓ Psychological First Aid (PFA) developed as an evidence-informed approach
- ✓ Emerged as a mainstay for early psychological intervention
- ✓ The first, and most favored, early intervention approach
- ✓ AHS uses and teaches the WHO model

# What PFA is

- ✓ Non-intrusive, practical care and support.
- ✓ Listening, but not pressuring people to talk.
- ✓ Comforting people and helping them to feel calm.
- ✓ Helping people connect to information, services and social supports.

# What PFA is NOT

- ❖ It is NOT professional counselling.
- ❖ It is NOT "psychological debriefing."
- ❖ It is NOT asking people to analyze what happened or put time and events in order.

**Although PFA involves being available to listen to people's stories, it is NOT pressuring people to tell you their feelings or reactions to an event.**

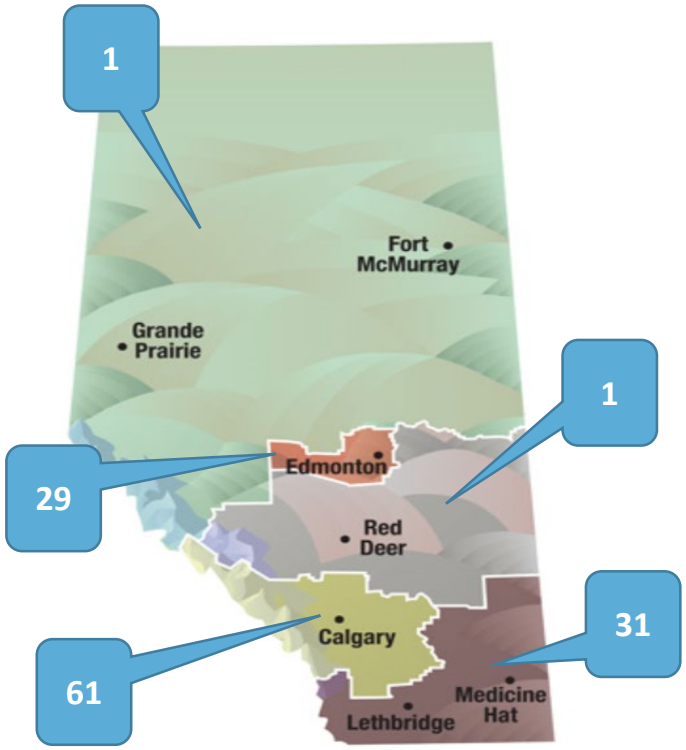
# Our staff are already skilled.


- ✓ Let's make it OK to say
  " I am not OK."
- ✓ Let's improve overall support structures.
- ✓ Let's reduce burn out.

**Let's make us stronger!**

# PFA Critical Care training completed

- The first PFA for Critical Care was offered on April 2o.
- Professions that have completed PFA for Critical Care.
  - Registered Nurses
  - Intensivists (Pediatrics)
  - Registered Respiratory Therapists
  - Management
  - Educators
  - Unit Clerks
  - Social Workers
  - Occupational Therapists
  - Provincial Directors




**Total participants to date: 129**

# PFA ongoing support

- PFA providers and front line staff require support.
- CC SCN will be hosting a zoom drop in once a week for staff to attend.
- Open forum for people to connect, learn and provide support to each other.
- Invites will go out to all who have taken the course.

# References


Lu W, Wang H, Lin Y, Li L. Psychological status of medical workforce during the COVID-19 pandemic: A cross-sectional study. Psychiatry Res. 2020 Apr 4;288:112936.Taken from: https://www.ncbi.nlm.nih.gov/pubmed/32276196

Wang C, Pan R, Wan X, Tan Y, Xu L, Ho CS, Ho RC. Immediate Psychological Responses and Associated Factors during the Initial Stage of the 2019 Coronavirus Disease (COVID-19) Epidemic among the General Population in China. Int J Environ Res Public Health. 2020 Mar 6;17(5). Taken from: https://www.ncbi.nlm.nih.gov/pubmed/32155789

# Sedation Management and Conservation

Paul Boiteau

Paul Boucher

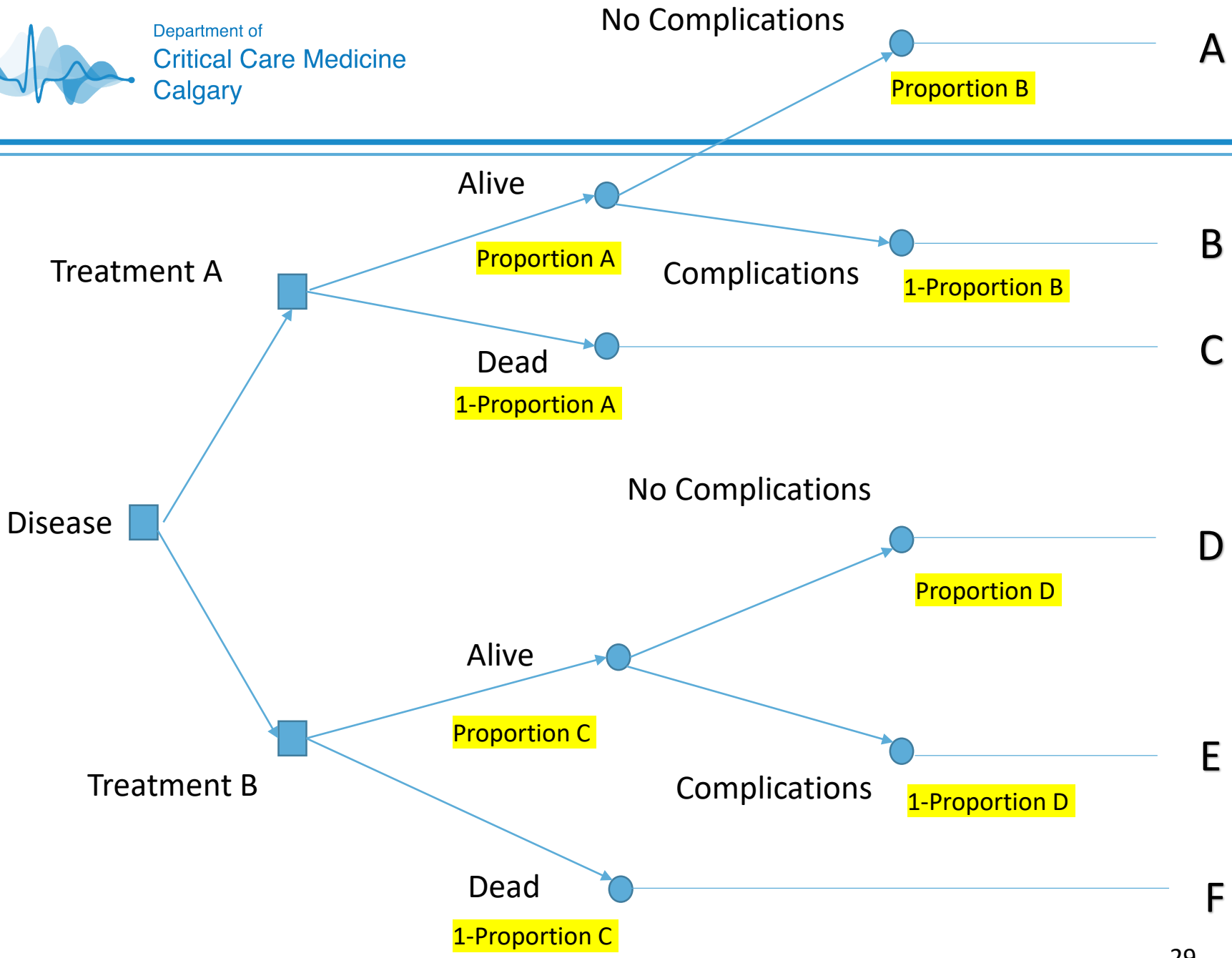
Barry Kushner

# What is needed to care for 1250 ARDS patients?

- "Probable" projection from early April
  - To be revised this week
- Modeling focuses on patient numbers and timing
  - Capacity for acute care, critical care and ventilators
- What about "non-renewable resources"
  - Supply chain management
  - Drug shortages

# Health Utilization models: The Decision Tree

- Decision tree models are one of the simplest forms of economic decision models.
- Commonly used in health economics to assess costs and outcomes between different treatments or care pathways to evaluate their relative cost effectiveness.


No Complications
A
Proportion B
Alive
Proportion A
Treatment A
Complications
B
1-Proportion B
Dead
C
1-Proportion A
No Complications
Disease
D
Proportion D
Alive
Proportion C
E
Treatment B
Complications
1-Proportion D
Dead
F
1-Proportion C

# Dealing with Uncertainty: Probabilistic Analysis

- Each estimate in the decision tree has a degree of uncertainty
  - Define the uncertainty
  - Assign a distribution
    - Means, SE
  - Replicate the model ~1000 times
- Provides a point estimate
  - 95% ”credible interval”
- Sensitivity analyses

# ARDS Utilization Model

- Based on a cohort of sustained ARDS patients
  - Calgary Zone
  - Dr Ken Parhar
- 633 patients with detailed data

# The Cohort: vs CoVID

| | Parhar (633) | ICNARC April 24 (2667*) |
|---|---|---|
| Mild (P/F >200) | 31.6 | 13.5 |
| Moderate (P/F 100-200) | 54.2 | 48.6 |
| Severe (P/F<100) | 14.2 | 37.9 |
| Mortality | 27.0 | 65.4 |
| ICU LOS | 11(6,18) | 11 (7,16) |
| Vent days | 9 (5,15) | 9 (6,14) |
| Renal Support | 16.7 | 30.6 |

*patients with Advanced respiratory support

# Utilization data for the cohort

- Severity based on Berlin criteria
- Outcomes, ICU/hosp LOS/Vent days
- Proportion with advance therapies utilization
  - Pressors
  - Inhaled vasodilators
  - Paralytic
  - CRRT
  - Transfusion
  - Tracheostomy
  - ECLS

# Utilization data for the cohort

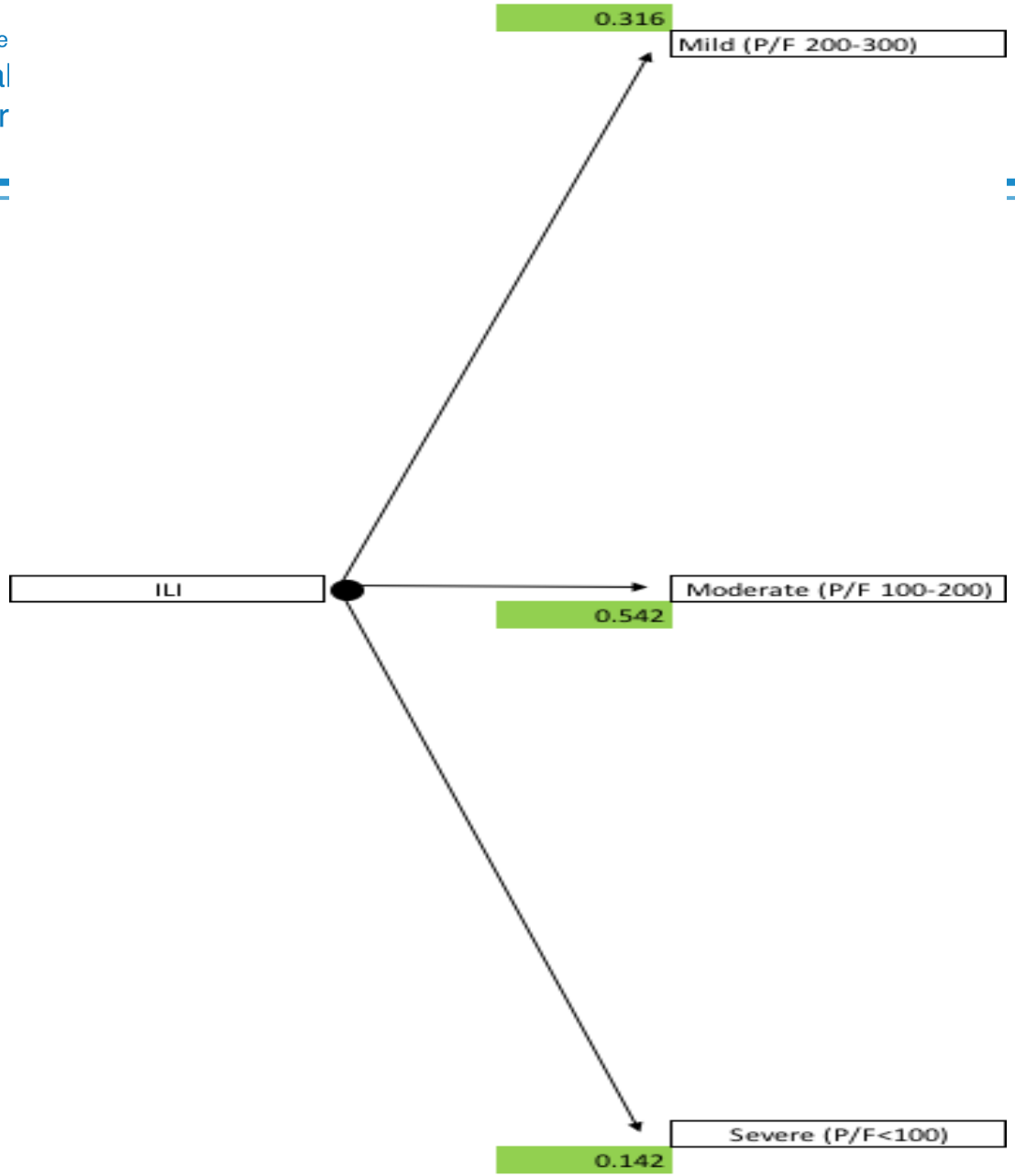
- Does not include detailed pharmacy data
- Clinical assumptions made to model
  - Validated with
    - Pharmacy
    - Intensivists from Calgary and Edmonton

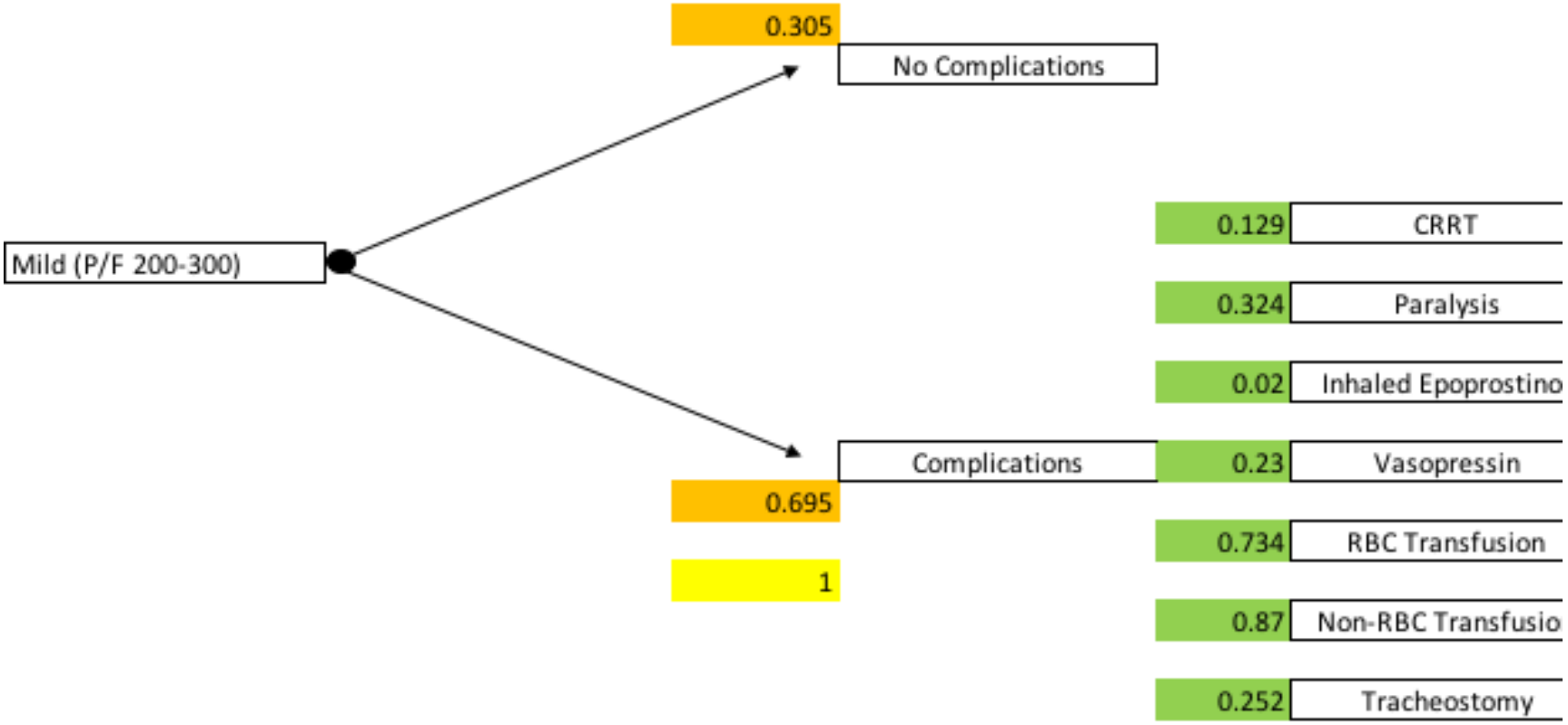
# The model

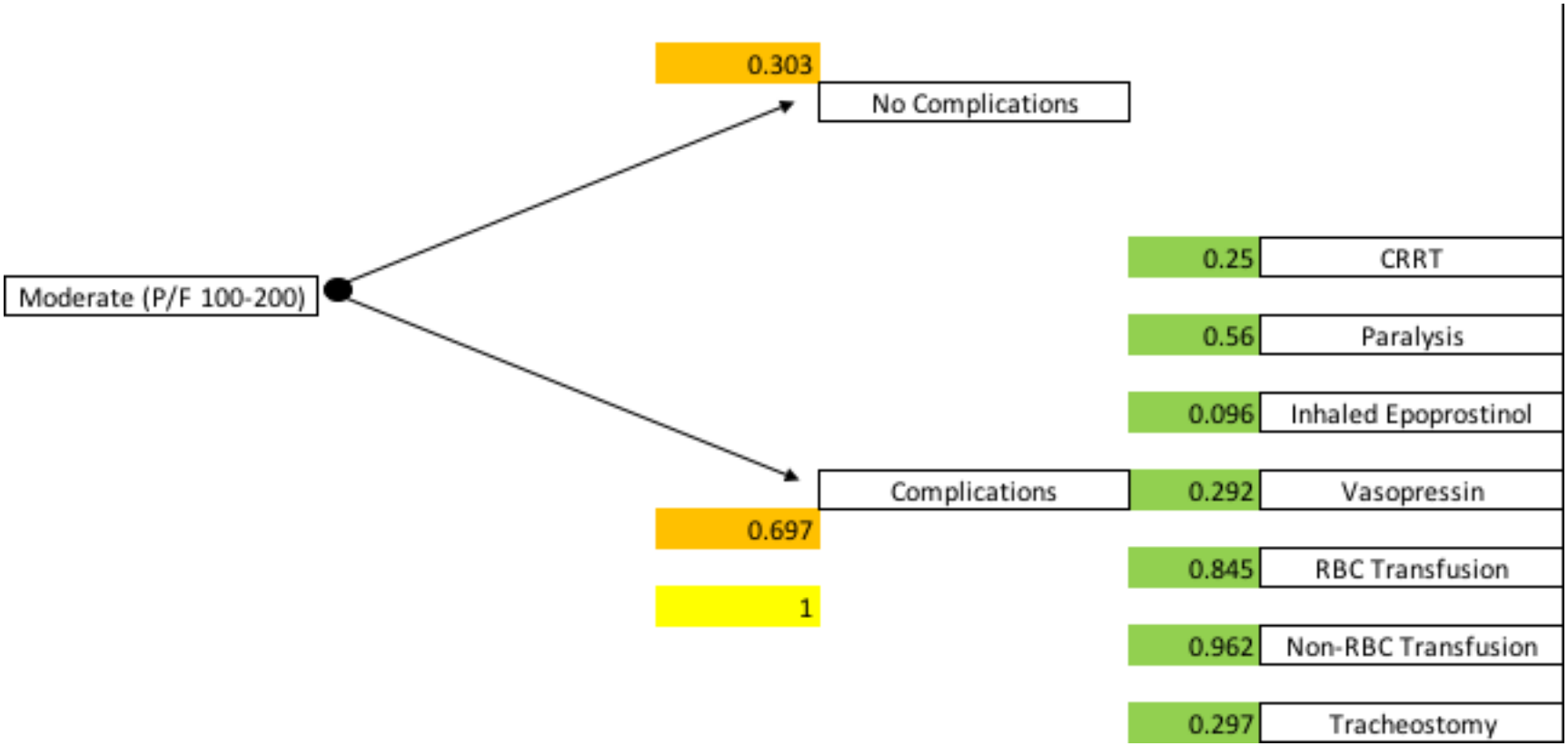
- To find a balance between nuanced patient populations and simplicity
- Utilization assigned by severity of ARDS
- Severity groups further divided:
  - No complications
  - Complications
  - Based on use of Norepinephrine

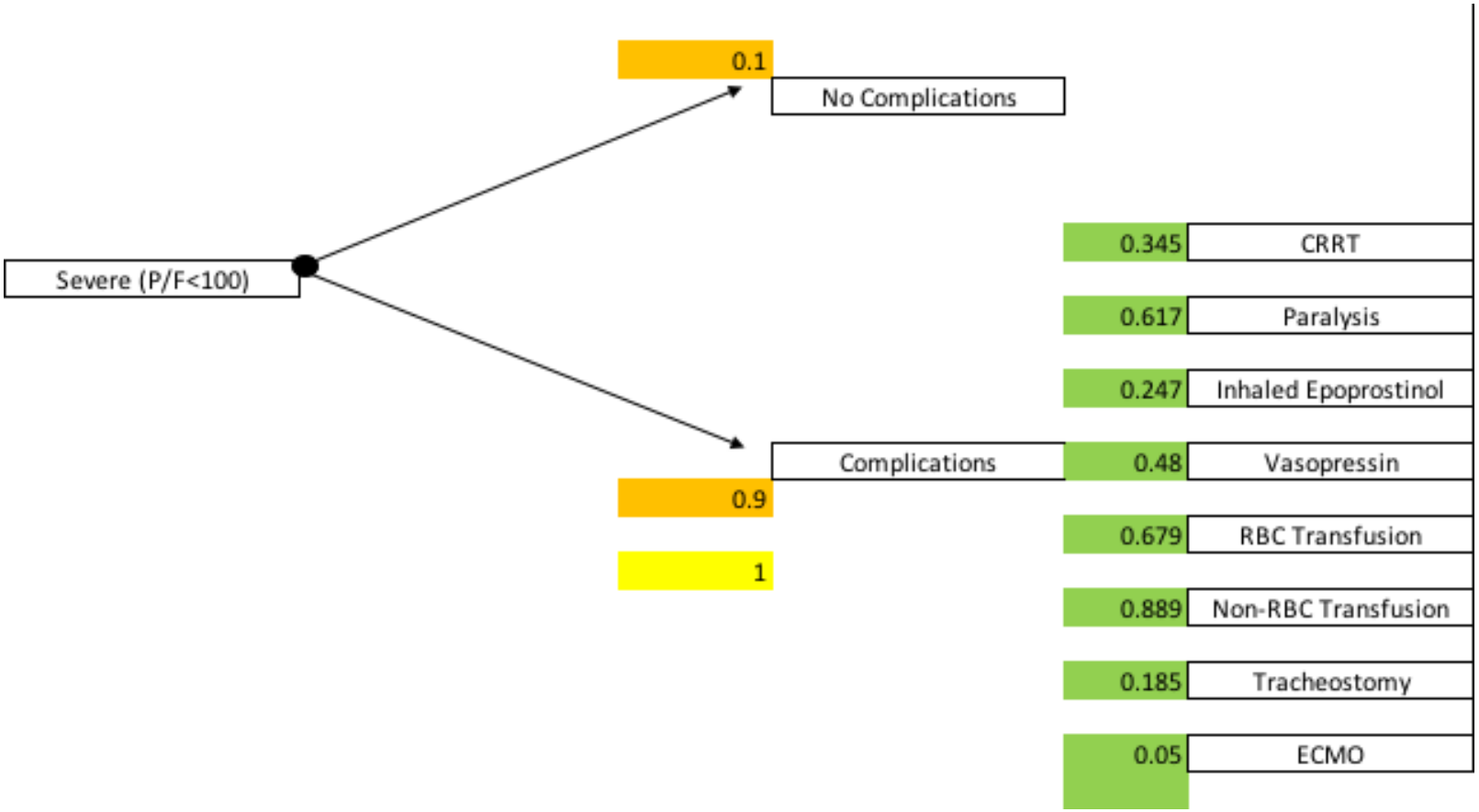
# The Model

- No complications group
  - Assigned a ”basic utilization”
    - Lines, Antibiotics for CAP, pDVT, sedation and analgesia
- Complications group
  - Assigned same “basic utilization”
  - Modeled proportions receiving advanced therapies
    - CRRT, inhaled vasodilators, vasopressin, paralytics, tracheostomies, transfusion, ECLS, nosocomial antibiotics


0.316
Mild (P/F 200-300)
ILI
Moderate (P/F 100-200)
0.542
Severe (P/F<100)
0.142


0.305
No Complications
Mild (P/F 200-300)
Complications
0.695
1
0.129
CRRT
0.324
Paralysis
0.02
Inhaled Epoprostino
0.23
Vasopressin
0.734
RBC Transfusion
0.87
Non-RBC Transfusio
0.252
Tracheostomy


Moderate (P/F 100-200)
0.303
No Complications
Complications
0.697
1
0.25
CRRT
0.56
Paralysis
0.096
Inhaled Epoprostinol
0.292
Vasopressin
0.845
RBC Transfusion
0.962
Non-RBC Transfusion
0.297
Tracheostomy


Severe (P/F<100)
0.1
No Complications
Complications
0.9
1
0.345
CRRT
0.617
Paralysis
0.247
Inhaled Epoprostinol
0.48
Vasopressin
0.679
RBC Transfusion
0.889
Non-RBC Transfusion
0.185
Tracheostomy
0.05
ECMO

# Pharmacy Totals per vial (1250 Patients)

| Medication | Probabalistic mean | Lower 95% CI | Upper 95% CI |
|---|---|---|---|
| Cis-atricurium (2mg/ml) 10 ml vials | 15033 | 9483 | 21640 |
| Rocuronium 10 mg/ml - 5 ml vial | 20103 | 12430 | 29041 |
| Fentanyl 50 ug/ml - 20 ml vials | 19930 | 12491 | 29010 |
| Midazolam 5 mg/ml - 10 ml vials | 19945 | 12728 | 28678 |
| Propofol 10 mg/ml - 100 ml vials | 48093 | 30265 | 70157 |
| Ceftrtiaxone 1g/vial | 8791 | 7222 | 10530 |
| Azithromymin 500 mg/vial | 8772 | 7128 | 10457 |
| Tinzaparin 20 000 U/2ml vial | 5418 | 3584 | 7691 |
| Piperacillin/Tazobactam 4.5g/0.5g vial | 23202 | 17916 | 29781 |
| Vancomycin 5g/vial | 1745 | 1336 | 2230 |
| Meropenem 1g/vial | 6502 | 4963 | 8270 |
| Micafungin 100 mg/vial | 606 | 449 | 793 |
| Vasopressin 20 U/1 ml vial | 4849 | 3587 | 6459 |
| Norepinephrine 1 mg/ml - 4 ml vial | 28019 | 21109 | 35764 |
| Inhaled Epoprostinol 1.5 mg/vial | 1175 | 797 | 1670 |

# CRRT Totals (1250 Patients)

| Medication | Probabalistic Mean | Lower 95% CI | Upper 95 CI |
|---|---|---|---|
| Prismocal 5000 ml/bag | 22273 | 13032 | 34250 |
| NS Replacement 3000 ml/bag | 4432 | 2581 | 6741 |
| Sodium Citrate (40g/1 L bag) | 9009 | 5398 | 14562 |
| Calcium Chloride 1g per 10 ml vial | 31845 | 18550 | 48521 |

Alberta Health Services
Pharmacy Services

Special COVID-19 Issue: April 15, 2020

Drugs and Therapeutics Backgrounder

# Conservation of Neuromuscular Blockers, Analgesics and Sedative Agents for Intubated Critical Care Patients During the COVID-19 Pandemic

# Intubated Patients
# Non-Neurologic Condition

***Anticipated short-term endotracheal intubation (< 72 hours)***

Use as needed (PRN) parenteral opioids (i.e., morphine, hydromorphone) and benzodiazepines (i.e. lorazepam, diazepam) to maintain target sedation and for comfort.

Limit propofol infusion duration to 48 hours and titrate dose to a target RASS to minimize dosing.

- If it is anticipated that sedation will be required for longer than 72 hours, transition the patient to alternate sedative +/- analgesic agents (see below)

Use ketamine infusions where clinically appropriate as a propofol and opioid dose sparing strategy.

- Ketamine dosing: 0.3 to 1.2 mg/kg/hr via continuous IV infusion
  - Caution in patients with increased intracranial pressure or cardiac concerns

To conserve parenteral agents:

- For patients with a functioning GI tract, use around the clock doses of oral opioids (i.e., hydromorphone, morphine) and/or benzodiazepines (i.e., lorazepam, diazepam, clonazepam) to minimize use of parenteral agents.

Department of
Critical Care Medicine
Calgary

# Intubated Patients
# Non-Neurologic Condition

***Anticipated longer term duration of invasive mechanical ventilation (> 72 hours)***

Use midazolam IV infusion (1 to 10 mg/hr) with or without an opioid (morphine or hydromorphone) via continuous infusion.

- Titrate the midazolam infusion to a target RASS to minimize dosing
- Morphine dosing: 1 to 10 mg/hr via continuous IV infusion
  - If higher doses of morphine are required, consider conversion to hydromorphone
- Hydromorphone dosing: 1 to 10 mg/hr via continuous IV infusion

Use as needed (PRN) parenteral opioids (i.e., morphine, hydromorphone) and benzodiazepines (i.e. lorazepam, diazepam) to maintain target sedation and for comfort.

To conserve parenteral agents challenge the GI tract as soon as possible:

- For patients with a functioning GI tract, use around the clock doses of oral opioids (i.e., hydromorphone, morphine) and benzodiazepines (i.e., lorazepam, diazepam, clonazepam).
  - For patients requiring deep sedation and neuromuscular blockade, the use of oral opioid and benzodiazepines may be used as a dose sparing strategy to the use of parenteral agents.

# Intubated Patients Neurologic Condition

## Intubated neurologic patients* in need of frequent/regular clinical assessments:

The need for short acting medications is imperative in this group of patients:

- Propofol IV infusion 0 to 50 mcg/kg/min +/- opioid bolus, as needed
- Avoid continuous opioid infusions

*Patients with the following (less than exhaustive) primary or associated diagnoses: traumatic brain injury, status epilepticus, intra-cerebral hemorrhage, sub-arachnoid hemorrhage, brain tumour, intracranial hypertension, cerebral edema, meningoencephalitis, anoxic-ischemic encephalopathy, metabolic encephalopathy and spinal cord injury.

# Neuromuscular Blocking Agents

For patients who require neuromuscular blockade:

- Rocuronium is the neuromuscular blocker of choice. Use ideal body weight for dosing.
- Use intermittent boluses preferentially over infusions to facilitate protective lung ventilation.
- Continuous infusions may be used in the event of persistent ventilator dyssynchrony, prone ventilation, or persistently high plateau pressures.

# Summary

- Propofol only for procedures & limited time usage for MV sedation (< 48 hrs).
- Fentanyl only for procedures & limited time usage for MV sedation (<48 hrs).
- NMB preference to IV Rocuronium on a PRN basis.
- Use of Morphine or Hydromorphone as narcotics of choice with transition to enteral dosing ASAP.
- Use of IV Ketamine infusion for sedation and/or as an analgesia sparing strategy.
- Benzodiazepines as choice sedation agents; IV/Enteral.*

# Practice Change Starting Date

**Recommendation:**

**NOW**

# *Care for all* patients

We aim to provide all patients

with the care they need

# *Safety for all staff*

We aim to protect all team members

from SARS-CoV-2

# Upcoming Town Halls…

- What do you want to learn next?
- What are the emerging issues we need to address as a Department?
- Send ideas and thoughts to:
  - Jon Gaudet, Dan Niven, Chip Doig, Amanda Roze