

Profile

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PhD Mathematical Modelling(Health Systems Engineering)

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Interim Org Sec Global Network for Public Health Nurses(Africa Chapter)

Special interest

Health System engineering, Health Informatics, System Dynamics Modelling



IMPLICATIONS HEALTHCARE SYSTEMS IN OXYGEN THERAPY IN COVID-19 PANDEMIC

A CASE OF KENYA

Coronavirus in Kenya

AS AT 4PM (EAT) AUGUST 8, 2020



699 **25,837**

NEW CASES **TOTAL CASES**

418 **11,899**

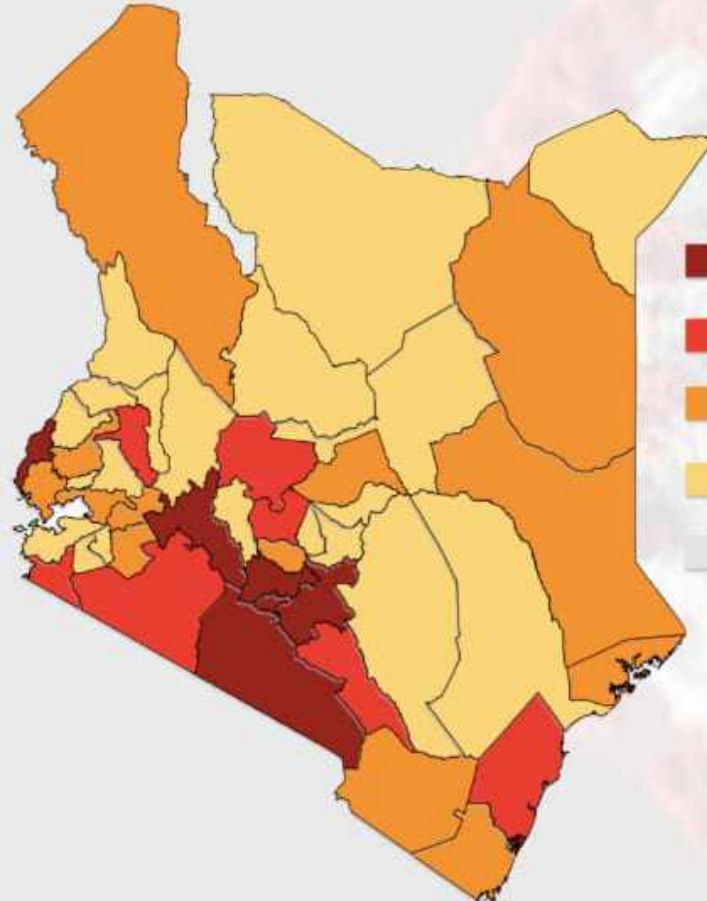
FATALITIES **RECOVERIES**

13,520 **349,307**

ACTIVE CASES **TESTS**

MOST AFFECTED COUNTIES

Nairobi	16,062
Mombasa	2,123
Kiambu	1,857
Kajiado	1,474
Machakos	923
Busia	844
Nakuru	554



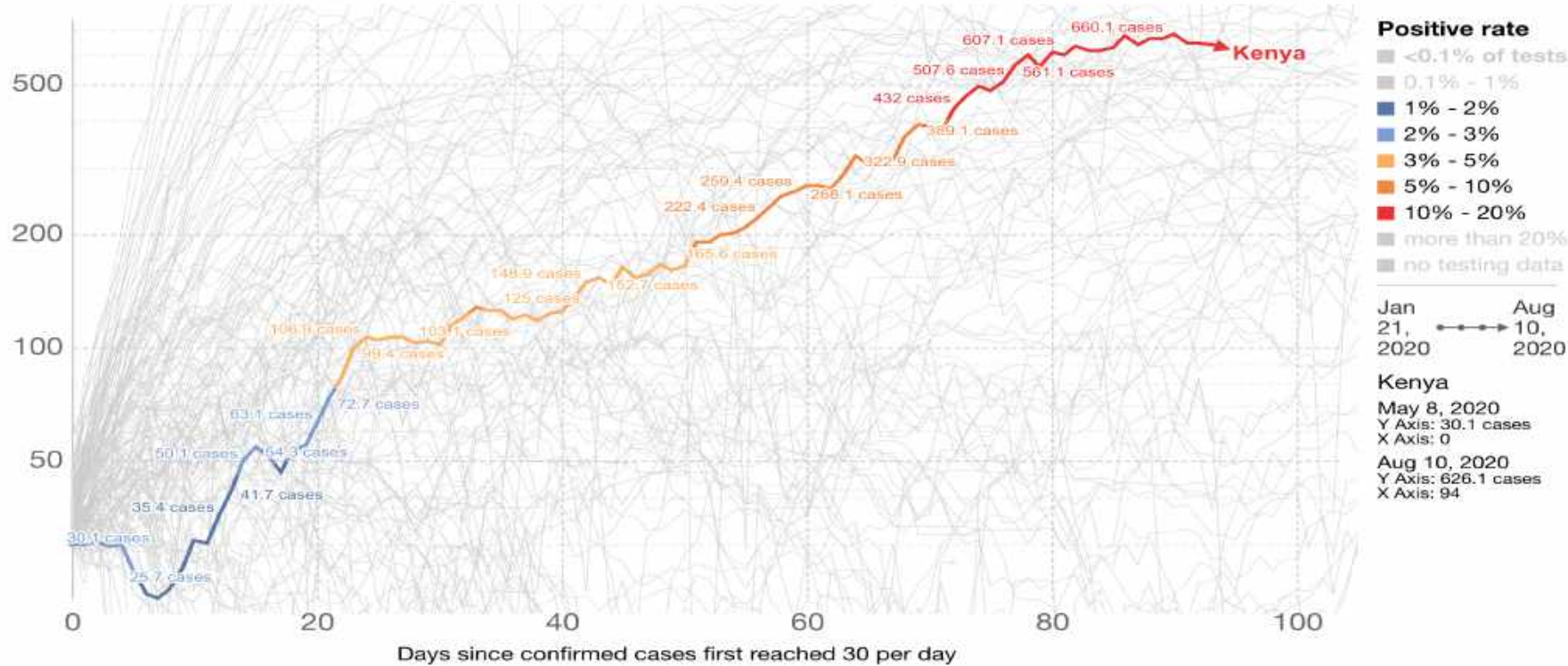
OTHER COUNTIES WITH CASES

Uasin Gishu	333	Wajir	29
Migori	325	Bungoma	29
Narok	160	Kirinyaga	27
Nyeri	153	Mandera	26
Kisumu	130	Nandi	25
Kilifi	115	Kitui	24
Garissa	115	Trans Nzoia	23
Makueni	104	Isiolo	21
Laikipia	103	Vihiga	19
Murang'a	94	Embu	19
Kericho	93	Nyandarua	15
Turkana	74	Homabay	15
Meru	65	Baringo	13
Kwale	64	Samburu	11
Bomet	57	Marsabit	10
Siaya	57	Nyamira	9
Taita Taveta	56	Tana River	8
Kisii	54	Tharaka Nithi	7
Lamu	36	Elgeyo Marakwet	5
Kakamega	35	West Pokot	1

CURRENT STATUS OF COVID-19

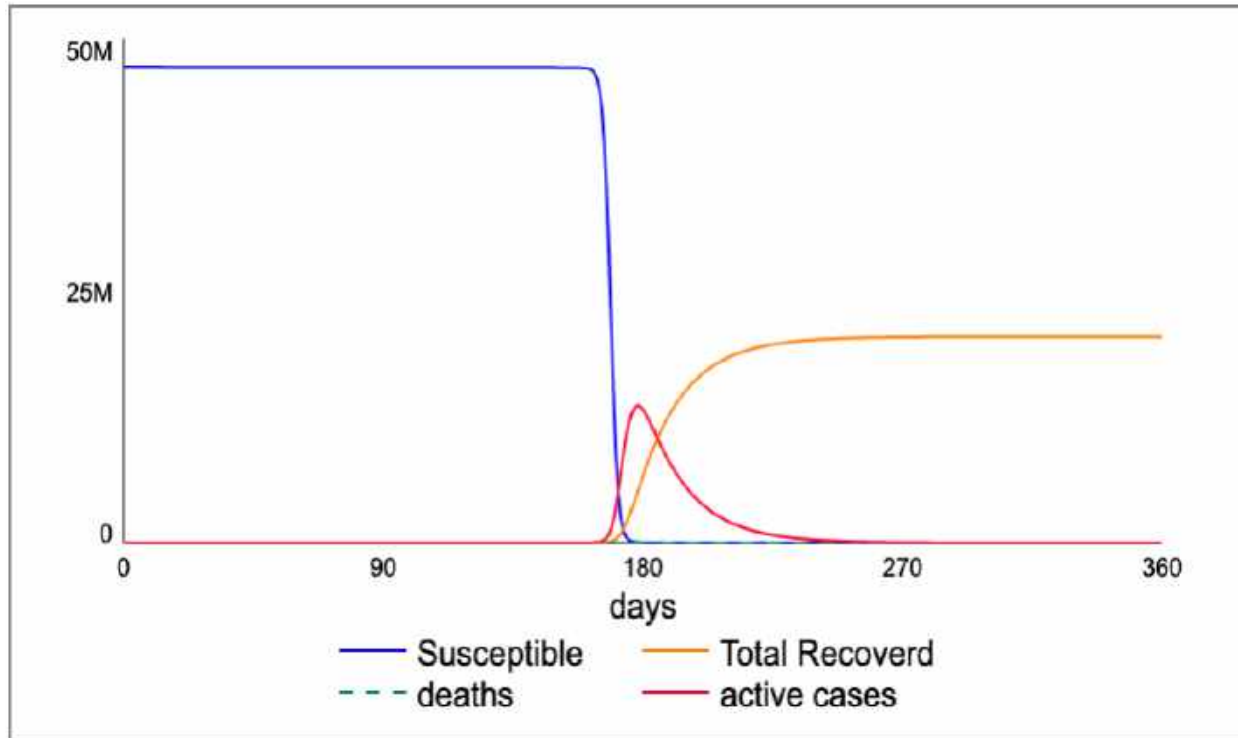
Daily new confirmed COVID-19 cases

Shown is the rolling 7-day average. The number of confirmed cases is lower than the number of actual cases; the main reason for that is limited testing.



Source: European CDC – Situation Update Worldwide – Last updated 10 August, 10:34 (London time), Official data collated by Our World in Data
CC BY

Simulated Scenario of Covid-19 Possible Trajectory in Kenya as of 31st July 2020.



- Peak September 2020 -Approx. 13.6Million active cases

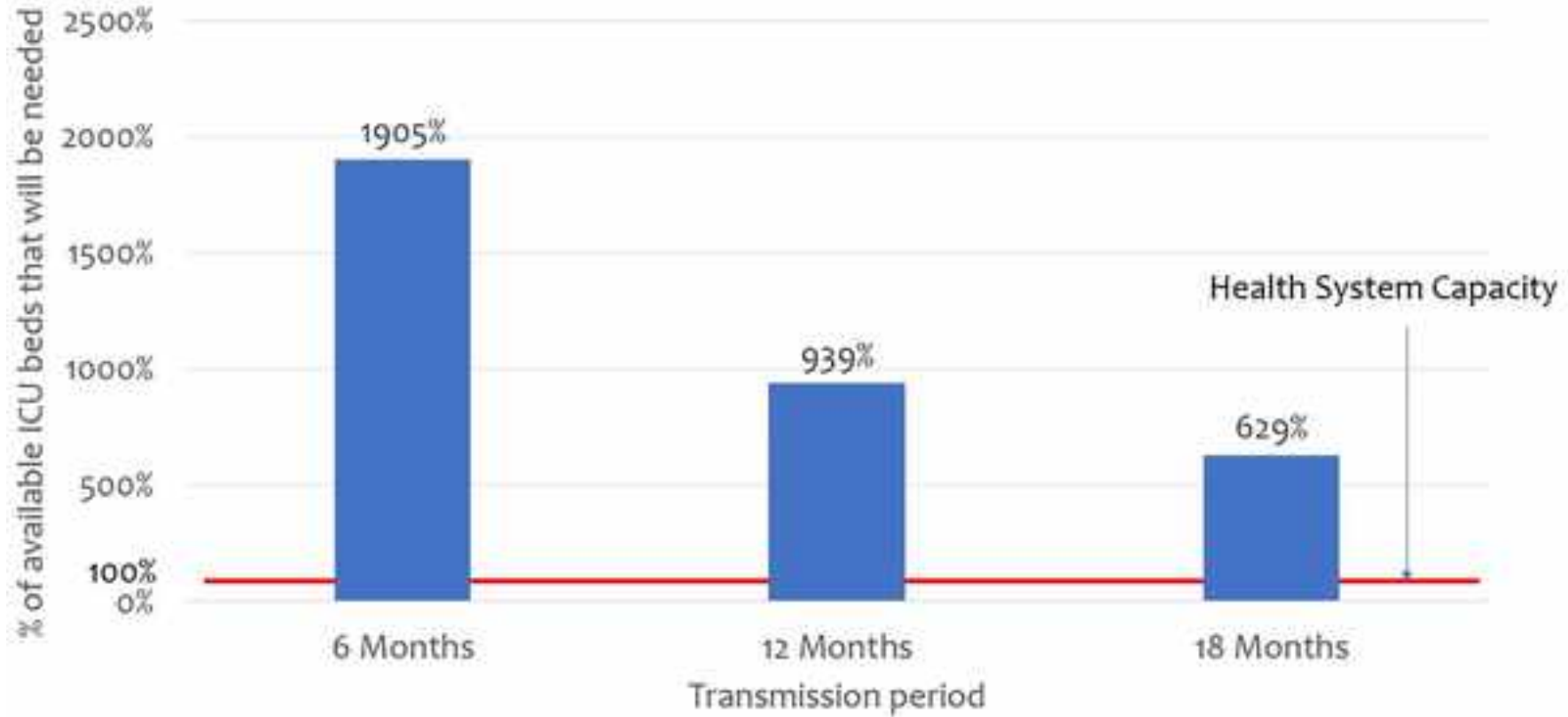
WHO Distribution

- mild-moderate =10.8m(80%)
- Severe=2.04m(15%)
- Critical =680,000 (5%)

OXYGEN THERAPY AND COUNTRY REQUIREMENT

- WHO, oxygen therapy is recommended for all severe and critical COVID-19 patients.
- Conservative 2% possible critical cases =272,000 patient
- 64,181 hospital beds across all sectors (public, faith based/NGO, private for profit), only 37,216 (58%) of these beds are in hospitals that have oxygen supply(Barasa et al,2020)
- Kenya has 537 ICU beds, it only has 256 ventilators(Barasa et al,2020)
- @ Each Patient ICU duration approx 6 days?
- Critical care nurses? -----, Other Health care professionals
- How many lives can we save?

Proportion of available ICU beds that would be required if 2% of the population are infected and develop symptoms.



Barasa EW, Ouma PO, Okiro EA (2020) Assessing the hospital surge capacity of the Kenyan health system in the face of the COVID-19 pandemic. PLOS ONE 15(7): e0236308. <https://doi.org/10.1371/journal.pone.0236308>
<https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0236308>

Additional requirements V/S Environment

Facility based care

-1,511 additional ICU beds(curve flattened in 12 months)

-1,609 ventilators(Flattened in 18 months)

COVID-19 treatment health-care facilities should be equipped with pulse oximeters, functioning oxygen systems including single-use oxygen delivery interfaces

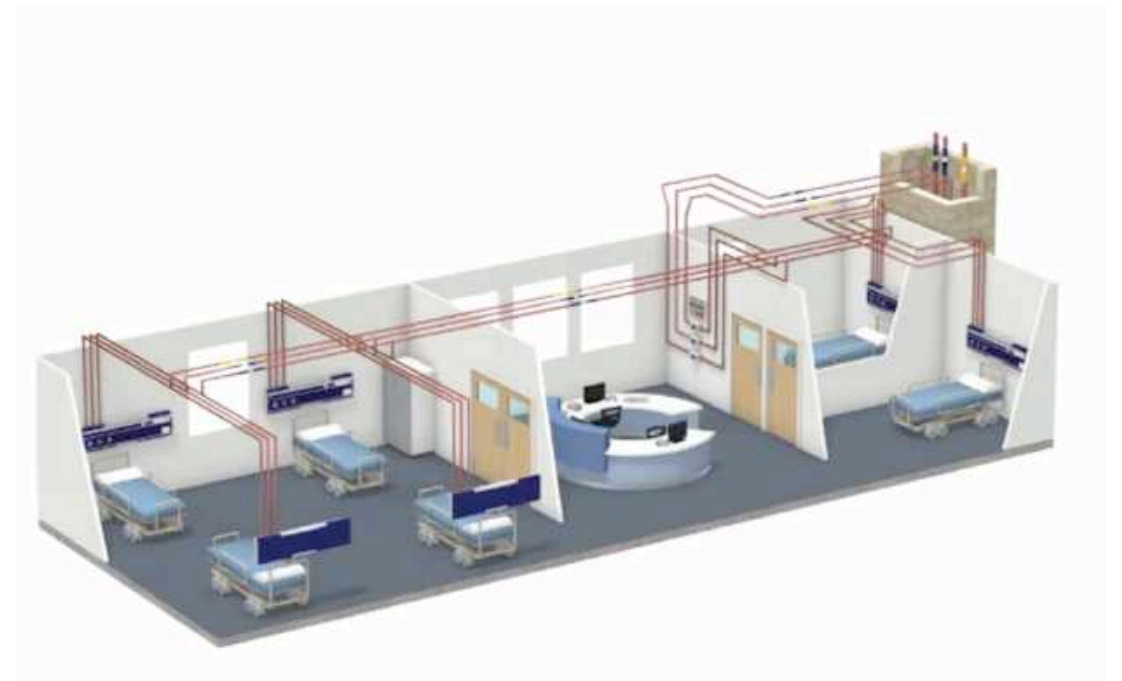
-Cost? Competing needs? Political influence?

Financial allocation? Corruption?

High demand v/s Efficiency

90% delivered oxygen directly from the tanks to the patient. ourtesy Emergencyn medicine foundation

Pipeline intra-hospital oxygen distribution networks



Home based care

Home based care v/s
Abandonment?-

Pulse oximeters

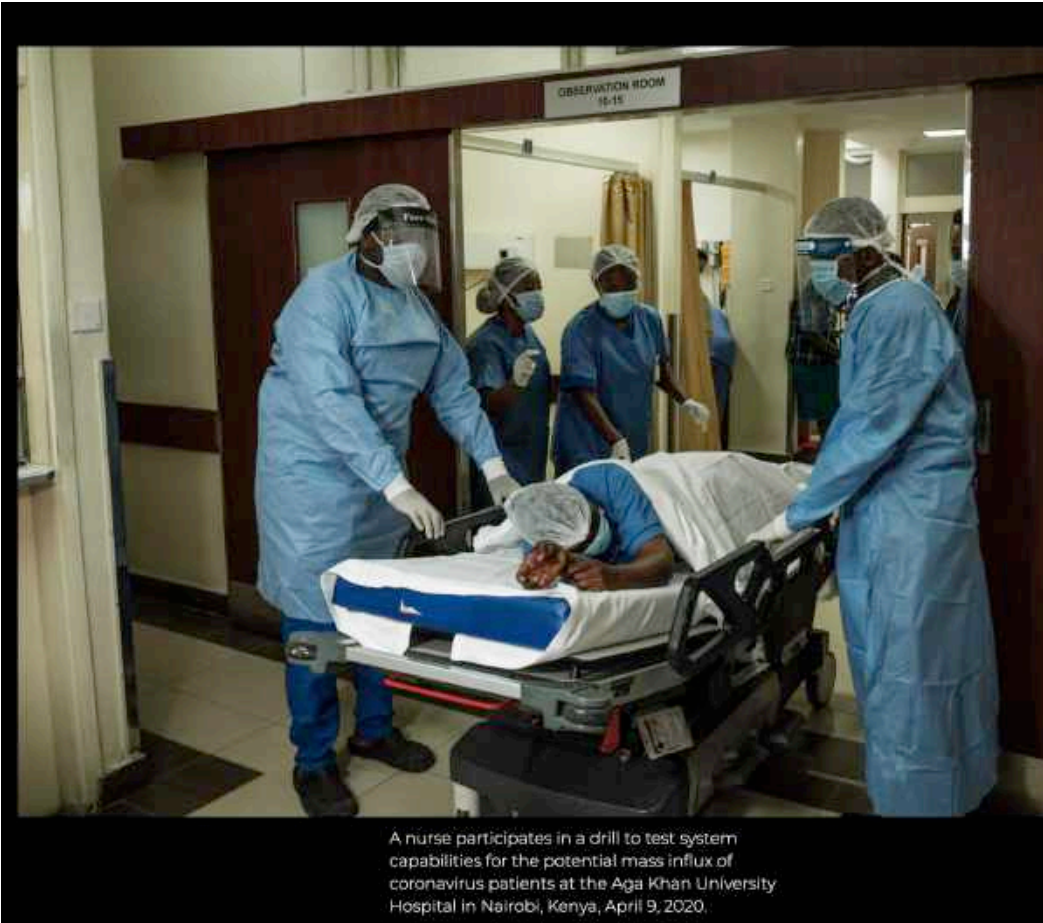
Vital signs monitoring-
Real time telehealth

--Data dissemination(
real time, store &
forward, email)

-Big Data management



HEALTHCARE WORKERS



A nurse participates in a drill to test system capabilities for the potential mass influx of coronavirus patients at the Aga Khan University Hospital in Nairobi, Kenya, April 9, 2020.

- Multidisciplinary approach
- ICU experience, specialists?- Numbers?
- Double exposure of health care workers(occupational,community)
- Further reduction in available staff.
- Older staffs at higher risk.
- Recall retired? x
- ✓ Many Young unemployed nurses at lower risk of complications

Knowledge, Attitude and Practices of Oxygen Therapy : Literature review

The Clinical Respiratory Journal

ORIGINAL ARTICLE

A wolf in sheep's clothing? Patients' and healthcare professionals' perceptions of oxygen therapy: An interpretative phenomenological analysis

Carol A. Kelly , Dave Lynes, Mary R. O'Brien, Ben Shaw






First published: 12 October 2016 | <https://doi.org/10.1111/crj.12571> | Citations: 6

Oxygen Therapy in Ugandan Paediatric Wards

Juliet Nabwire, Sophie Namasopo, Michael Hawkes 

Journal of Tropical Pediatrics, Volume 64, Issue 2, April 2018, Pages 97–103, <https://doi.org/10.1093/tropej/fmx033>

Published: 08 May 2017

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Volume 32, Supplement S1 (Abstracts of Scientific Papers-WADEM Congress on Disaster and Emergency Medicine 2017)

April 2017, p. S149

Knowledge, Attitude and Practice Study of Oxygen Therapy among Emergency Department Nurses in Addis Ababa, Ethiopia

Girma Lema ^(a1), Asefw W/ Tsadik ^(a2) and Lemlem Beza ^(a3) 

DOI: <https://doi.org/10.1017/S1049023X17004113> Published online by Cambridge University Press: 20 April 2017

IOSR Journal of Nursing and Health Science (IOSR-JNHS)
e- ISSN: 2320-1959, p- ISSN: 2320-1940 Volume 7, Issue 3 Ver. II (May-June .2018), PP 42-51
www.iosrjournals.org

Nurses' Knowledge, Practices and Barriers Affecting a Safe Administration of Oxygen Therapy

Mona Mohamed Mayhob

Lecturer- Faculty of Nursing – British University in Egypt

Abstract: "Oxygen therapy is like a two edged sword", at one edge oxygen is crucial for human being to survive, while at the other edge it may become toxic if it is delivered by inappropriate dose or method. This study was aiming to assess nurses' knowledge, practices and barriers affecting asafe administration of oxygen therapy.

Knowledge, Attitude Practice: Literature Review

Rural Nurses less confident

Home | Search | Journals | Books | Experts



Australian Critical Care

Volume 25, Issue 1, February 2012, Pages 23-30



Critical care nurses' opinion and self-reported practice of oxygen therapy: A survey

Glenn M. Eastwood RN, BN, BN (Hons), Grad Dip RN , Michael C. Reade MBBS, MPH,

**Contrast between knowledge and Practice. More adverse effect.
(Netherlands)**



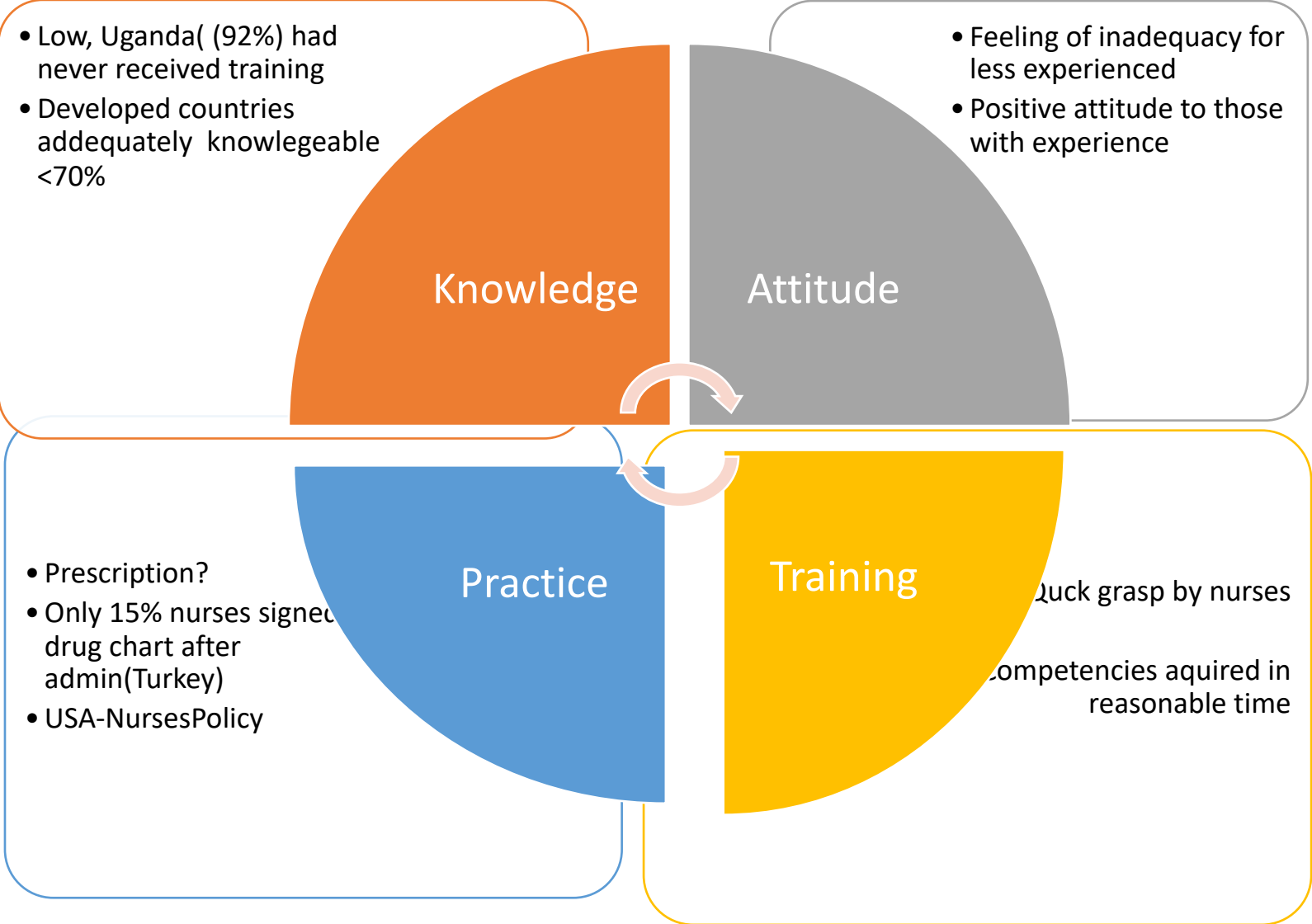
Research | **Open Access** |

Self-reported
of oxygen ther
nurses

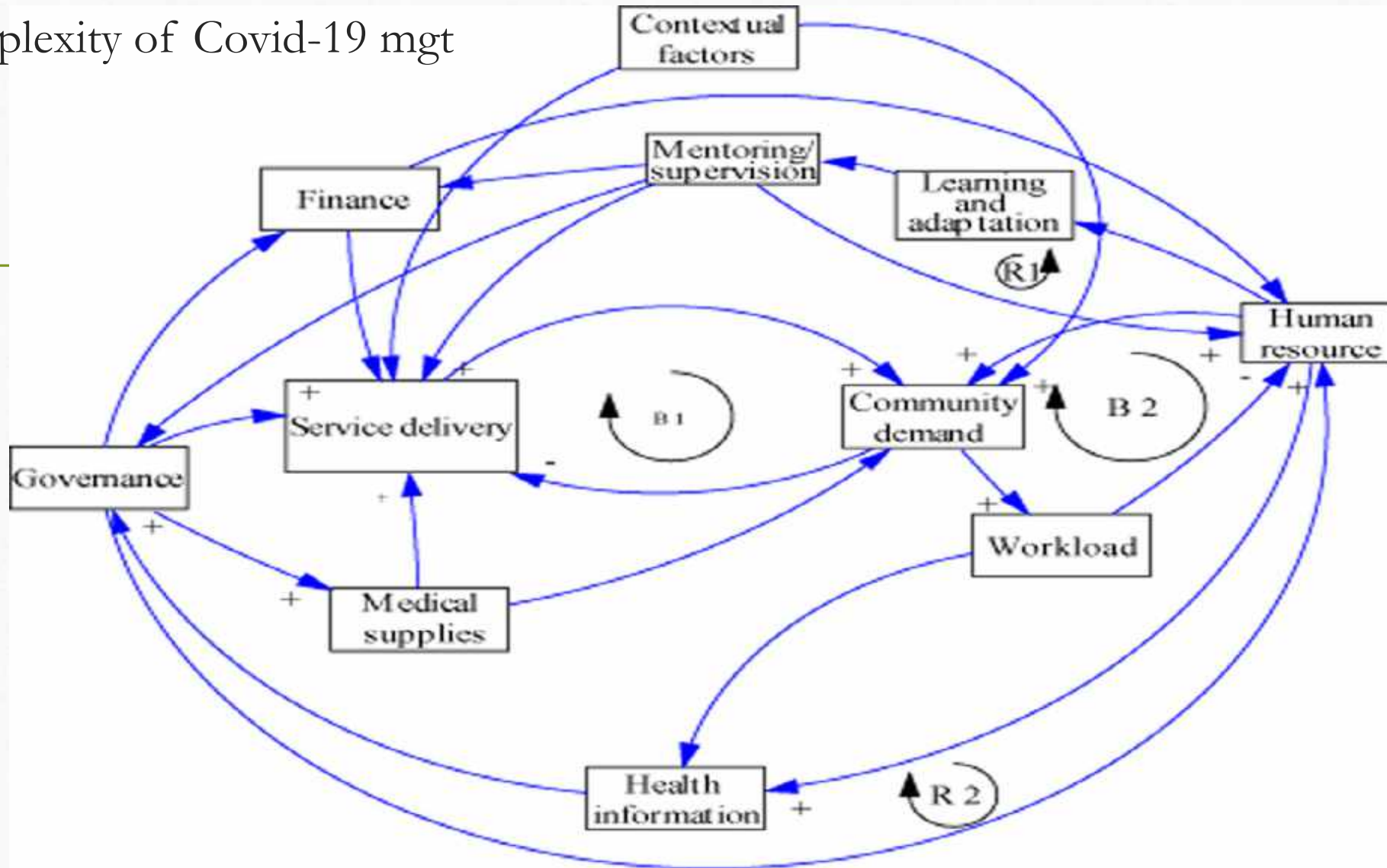
Marcus J Schultz X

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KAP IMPLICATIONS



- Complexity of Covid-19 mgt



CONCLUSION

- Increased demand of oxygen therapy due to Covid-19
 - Management of complexity of health care systems
 - Multiple Knowledge required/ Research
 - More supplies requirement
 - Training of Health care workers on Oxygen administration
 - Health care systems extra innovative coping strategies
 - Home based care-Oxygen therapy
 - E-health
 - Big data management
-
- ✓ Localised studies on oxygen therapy
 - ✓ CED / Train nurses on oxygen therapy