MMed and DCH Lectures

Weekly by Zoom

Prof Trevor Duke

MMed and DCH Lectures

Paediatric mortality auditing

September 21st, 2020

Prof Trevor Duke

Paediatric mortality auditing

- Adverse events in hospitals
- Quality improvement
- Mortality auditing
- Resources

Adverse event incidence studies

Country	Study	Incidence of adverse events	Deaths	Estimated cost
USA	Harvard Medical Practice Study N Eng J Med 1991;324:370-77	3.7%	13.6% of adverse events lead to death	Estimated 100,000 deaths per year
UK	Retrospective record review BMJ; 1995, 322: 517-9	10.8%	One third lead to moderate or greater impairment	1 billion pounds Sterling in additional bed days
Australia	Quality in Australian Health Care Study Med J Aust 1995;163:458-76	16.6%	50,000 Australians suffer permanent disability and 18,000 die at least in part as a result of their healthcare	4.17 billion dollars per year
New Zealand	Adverse events in New Zealand Public Hospitals, 1998	12.9%		
Canada	Canadian Adverse Events Study, 2000	7.5%		

ARTICLES

Quality of hospital care for seriously ill children in less-developed countries

Terry Nolan, Patria Angos, Antonio J L A Cunha, Lulu Muhe, Shamim Qazi, Eric A F Simoes, Giorgio Tamburlini, Martin Weber, Nathaniel F Pierce

Delivery of paediatric care at the first-referral level in Kenya

Mike English, Fabian Esamai, Aggrey Wasunna, Fred Were, Bernhards Ogutu, Annah Wamae, Robert W Snow, Norbert Peshu

Hospital services for children in the Solomon Islands: Rebuilding after the civil conflict

James Auto,[1] Titus Nasi,[1] Divi Ogaoga,[2] Julian Kelly[3] and Trevor Duke[3]

[1]Honiara National Referral Hospital, Ministry of Health, [2]Provincial Health Service, Guadalcanal Province, Ministry of Health, Solomon Islands and [3]Centre for International Child Health, University of Melbourne Department of Paediatrics, Royal Children's Hospital, Parkville, Victoria, Australia

Quality of hospital care for children in Kazakhstan, Republic of Moldova, and Russia: systematic observational assessment

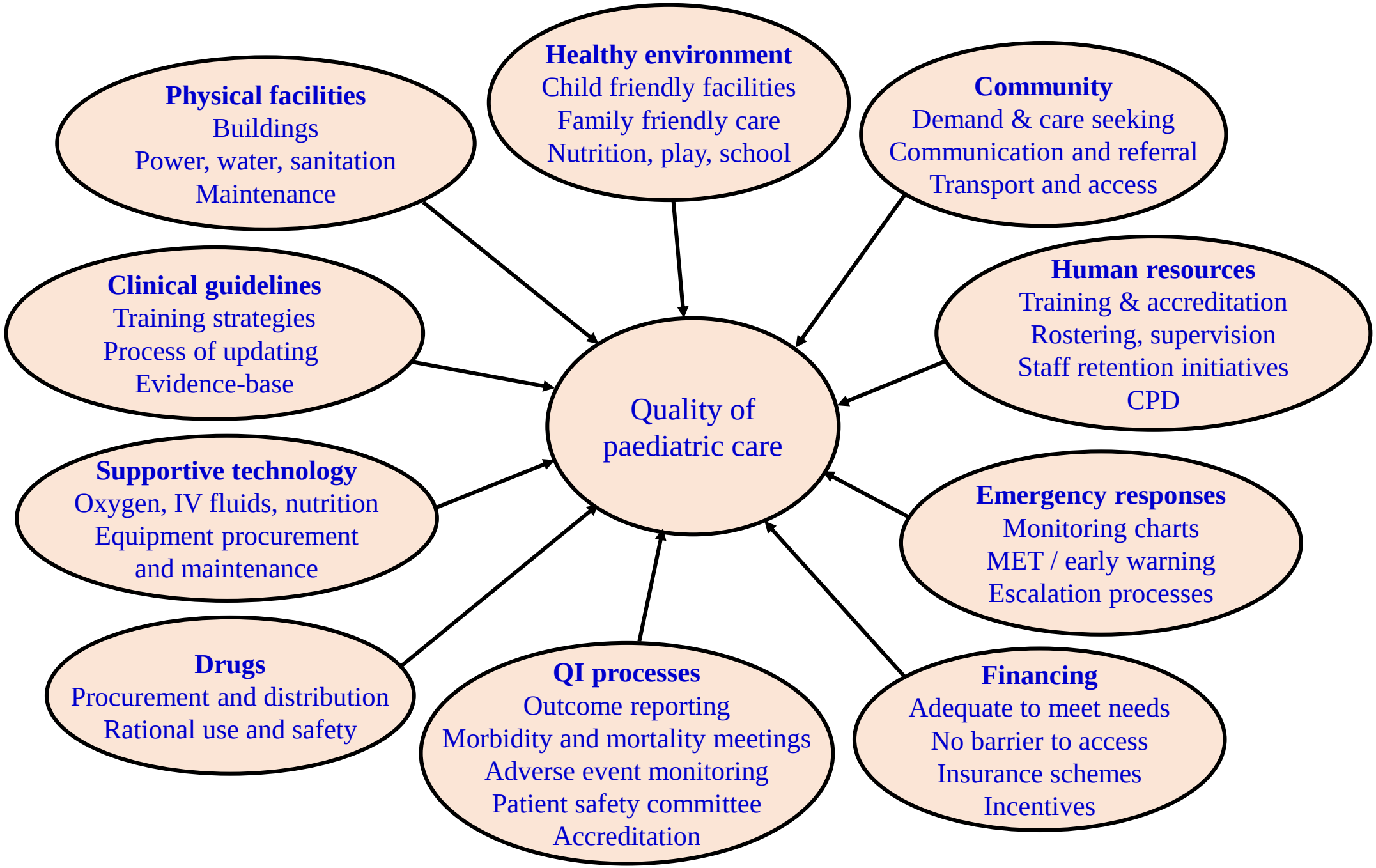
Trevor Duke, Elena Keshishiyan, Aigul Kuttumuratova, Mikael Ostergren, Irina Ryumina, Ekaterina Stasii, Martin W Weber, Giorgio Tamburlini

Clinical assessment and treatment in paediatric wards in the north-east of the United Republic of Tanzania

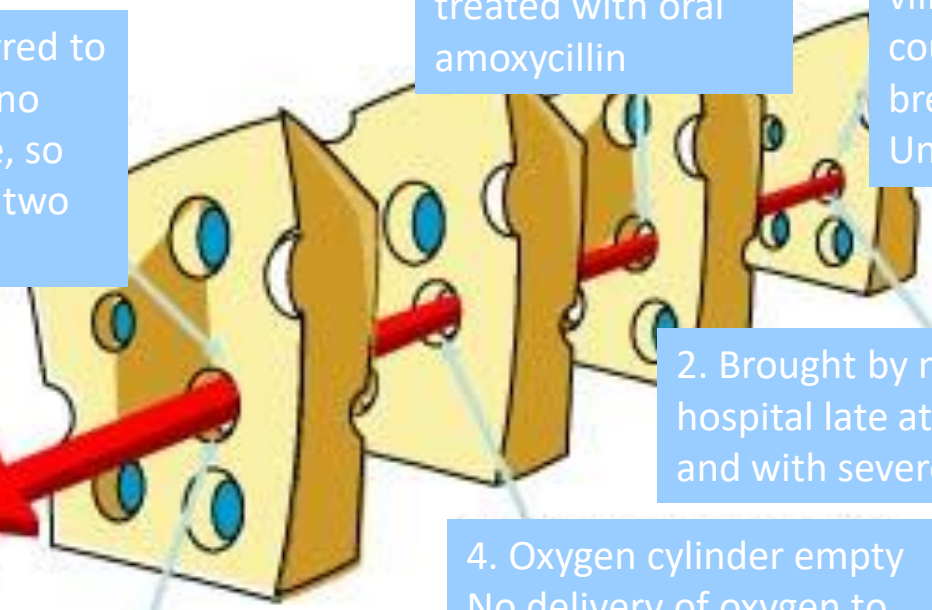
Hugh Reyburn,[a] Emmanuel Mwakasungula,[b] Semkini Chonya,[b] Frank Mtei,[b] Ib Bygbjerg,[c] Anja Poulsen[c] & Raimos Olomi[b]

2000-2010 – Quality of Care studies in low and middle income countries

- No system of triage
- Inadequate assessment
- Late treatment
- Inadequate drug and oxygen supplies
- Lack of evidence-based guidelines
- Insufficient monitoring of sick children
- Dangerous IV fluid practices
- Inadequate nutrition
- Neonatal care: VLBW babies
- Care of the comatose patient
- No training since graduation
- No systematic method of reporting outcomes or burden of disease data


Quality of paediatric care
Physical facilities
Buildings
Power, water, sanitation
Maintenance
Healthy environment
Child friendly facilities
Family friendly care
Nutrition, play, school
Community
Demand & care seeking
Communication and referral
Transport and access
Clinical guidelines
Training strategies
Process of updating
Evidence-base
Human resources
Training & accreditation
Rostering, supervision
Staff retention initiatives
CPD
Supportive technology
Oxygen, IV fluids, nutrition
Equipment procurement
and maintenance
Emergency responses
Monitoring charts
MET / early warning
Escalation processes
Drugs
Procurement and distribution
Rational use and safety
QI processes
Outcome reporting
Morbidity and mortality meetings
Adverse event monitoring
Patient safety committee
Accreditation
Financing
Adequate to meet needs
No barrier to access
Insurance schemes
Incentives

“Holes in the Swiss cheese”



3. Doctor not available: seen by nurses overnight, treated with oral amoxycillin

1. 9 month old infant from remote village referred for cough and difficulty breathing. Unvaccinated

5. In morning referred to base hospital, but no fuel for ambulance, so travel on a bus – a two hour journey

2. Brought by mother to district hospital late at night, unable to feed and with severe chest indrawing

7. Child arrested from hypoxia and died at 10 am

4. Oxygen cylinder empty No delivery of oxygen to the hospital in last week

6. Arrived at base hospital 9am: heart rate 190/min, cyanosed, respiratory rate 70/min. No pulse oximeter or oxygen in CED. Taken to children’s ward at 9.45am.

WHO guidelines on paediatric auditing

January 2019

https://pngpaediatricsociety.org/wp-content/uploads/2019/02/Paediatric-mortality-and-morbidity-audit-guideline-WHO-January-2019.pdf

Etiology of child mortality in Goroka, Papua New Guinea: a prospective two-year study

Trevor Duke,[1] Audrey Michael,[2] Joyce Mgone,[1] Dale Frank,[1] Tilda Wal,[2] & Rebecca Sehuko[2]

- Method - weekly mortality / morbidity meeting
- Each new death was discussed, the clinical, bacteriological and other laboratory data reviewed, and a consensus reached as to the causes of death and whether there were potentially avoidable factors.
- A forum for the systematic review of cases, for free discussion, and for teaching.
- Potentially avoidable factors in 177 (50%) of deaths

Definitions – potentially avoidable factors

- Community: delayed presentation of severely ill children; child neglect or abandonment; failure to access maternal care.
- Primary preventive health services: vaccine-preventable diseases; failure of disease-screening programmes.
- Primary curative health services: the health facility was closed or out of stock of basic drugs; referral was delayed more than 7 days after presenting to a primary health facility.
- Referral hospital: major errors in obstetric care; drug-prescribing; nosocomial infections; oxygen problems; and failure to give standard treatment

Benefits of audit

- Reduced avoidable mortality
  - In the first 6 months there were 99 deaths, of which 22% had avoidable in-hospital factors.
  - In the final 6 months there were 84 deaths, of which 7% had in-hospital avoidable factors
- Identification of community-based problems that were previously under-recognized: congenital syphilis as a major cause of neonatal deaths, and a measles epidemic

Evaluating the process and outcomes of child death review in the Solomon Islands

Mathew Sandakabatu,[1] Titus Nasi,[1] Carol Titiulu,[1] Trevor Duke[2,3]

- 33 child death review meetings, 66 neonatal and child deaths
- Areas for improvement:
  - communication
  - clinical assessment and treatment
  - availability of laboratory tests
  - antenatal clinic attendance
  - equipment for high dependency neonatal and paediatric care
- Many changes recommended by audit require a quality improvement team to implement.

- Audit is an *iterative* and *evolving process* that needs a structure, tools, evaluation, and needs to be embedded in the culture of a hospital as part of overall quality improvement, and requires a quality improvement team to follow-up and implement action plans

Principles of successful audit

- Hold regular meetings: sustainability is dependent on commitment by staff to be present at a regular time every week (or 2)
- Confidentiality: encourage open discussion inside the meeting, but no discussion of specific cases outside
- Attendance voluntary, but strongly encourage all staff to attend. Audits should involve all clinical staff; nurses, doctors, registrars, residents.
- Be non-blameful and non-threatening, and welcoming to staff
- The team leader should be open about declaring their own failings: this can put junior staff at ease
- Audit meetings should have a strong educational function; take the opportunity to teach on subjects that arise when they are relevant to quality of care

Principles of successful audit

- Use a team approach to identify and solve problems: get a wide spectrum of views on the cause and prevention of adverse events
- Be respectful and acknowledge all health workers' efforts. Try to understand how they are feeling if they have been caring for a child who has died
- Move from specific cases to general issues
- Look for common patterns of avoidable events; don't just react to a single rare mistake or event
- Do not single out individuals for blame. The team leader should emphasize how 'we' could do things better
- Consider the entire health system when trying to understand avoidable factors in deaths, not just curative referral-level hospital care, but what changes might be needed in the community

Principles of successful audit

- During each audit meeting comment specifically on ‘things that went right’. Complement health workers on their successes
- Emphasize the survival rate: eg if the mortality rate was 5%, then 95% of children admitted survived to discharge
- Suggest feasible and affordable changes in clinical practice, rather than repeatedly identifying problems that cannot be remedied because of external or financial constraints
- Have clear resolutions about action items and who will do them
- Review all previous weeks’ audit resolutions and follow up to determine if these were carried out

Audit and child rights

- Obligation to do justice to a life
- Not just a mechanical process (tools / outcomes / frameworks / systems), it is a *human process*…human relationships fundamental to effectiveness
- Can help families
  - to know that everything has been done, to know their child's life was valued and the death taken seriously, to know that we are committed to learning from the death.

https://pngpaediatricsociety.org/child-death-review-meetings/

Paediatric Society of Papua New Guinea

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Child Death Review Meetings

Mortality Review Meetings WHO January 2019

This is a description of how to conduct regular child mortality review meetings. The forms below are used for summarising the cases for discussion, identifying diagnoses, and drawing up a plan for actions and recommendations from the meeting.

Death Register Form

01 The Death registrar form is held in the ward, and the names of children who died are recorded. This is so that at the designated time each week that the audit meeting is going to be held, you will have a list of the cases for discussion. This form is taken to the meeting to ensure that all cases, or the selected cases, are discussed.

Child Mortality Reporting Form Version 2017

02 The Child Mortality Reporting Form is the main form used at the weekly audit meeting to record information about the case. It is best if the person who is coordinating the meeting fill some of the demographic information in before the meeting, so the meeting can focus on discussing the story, and

Hospital Record Number:

CHILD DEATH REVIEW FORM

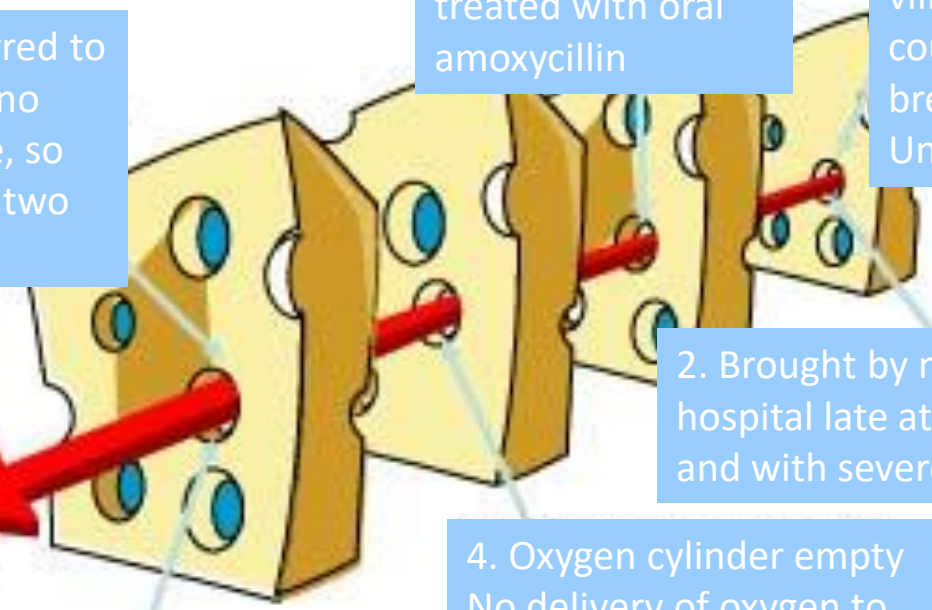
Please complete both sides of this form whenever a child or newborn dies in the community, a health centre or hospital. Also complete an official death certificate.

Name of child who died: _____		**Date of birth:** / /	**Age:** __ __yrs __ __mths __ __days
☐1 **Male** ☐2 **Female**	**Weight:** __ __ .__Kg	**Date of death:** / /	**Time of death:**__ __.__ __ am/pm
Province: _____	**District:** _____		**Village / town:** _____
Name of health facility reporting the death: _____			
1. Place of death: ☐1 Hospital ☐2 Health center ☐3 Home / village ☐4 In-transit to health facility		**2. No of days the child was sick before presentation:** __ __ days **3. Date of Hospital Admission:** / /	
4. Describe the story of what happened to the child			
5. Distance and time traveled to reach the health facility: __ __ km __ __ hrs **6. Mode of transport**_____			
7. Was child referred from another health facility ☐0 No ☐1 Yes (which one)_____		**8. Delay in transport or referral** ☐0 No ☐1 Yes (why)_____	
9. Had the child recently been an inpatient? ☐0 No ☐1 Yes (how many days ago was the child discharged)_____			
10. Neonatal death ☐0 No ***(go to Question 17)*** ☐1 Yes		**11. Mother attended antenatal care:** __ __ times	
12. Premature onset of labour ☐0 No ☐1 Yes ☐9 Unknown		**13. How long were the membranes ruptured before the baby was born:** __ __ hrs **14. Duration of labour:** __ __ hrs	

LIST OF DIAGNOSIS/CAUSE OF DEATH/ICD-10 CODES

Category	Diagnosis/ Causes of death	ICD-Code
Respiratory	Pneumonia	
	Bronchiectasis	
	Lung abscess	
	Pneumothorax	
	Whooping cough	
	Croup	
	Epiglottitis	
	Bronchiolitis	
	Asthma	
	Acute otitis media	
	Chronic serous otitis media	
	Covid-19 acute respiratory infection	
	Congenital malformations of the respiratory system	
	Respiratory other (specify)	
Gastrointestinal	Acute watery diarrhoea	
	Persistent diarrhoea	
	Dysentery	
	Cholera	
	Typhoid	
	Pigbel	
	Hepatitis	
	Gastrointestinal other	
Nutritional	Severe acute malnutrition –	
	Marasmus	
	Kwashiorkor	
	Iron deficiency	
	Vitamin A deficiency	
	Beri beri	
	Nutritional disorders – other (specify)	

“Holes in the Swiss cheese”



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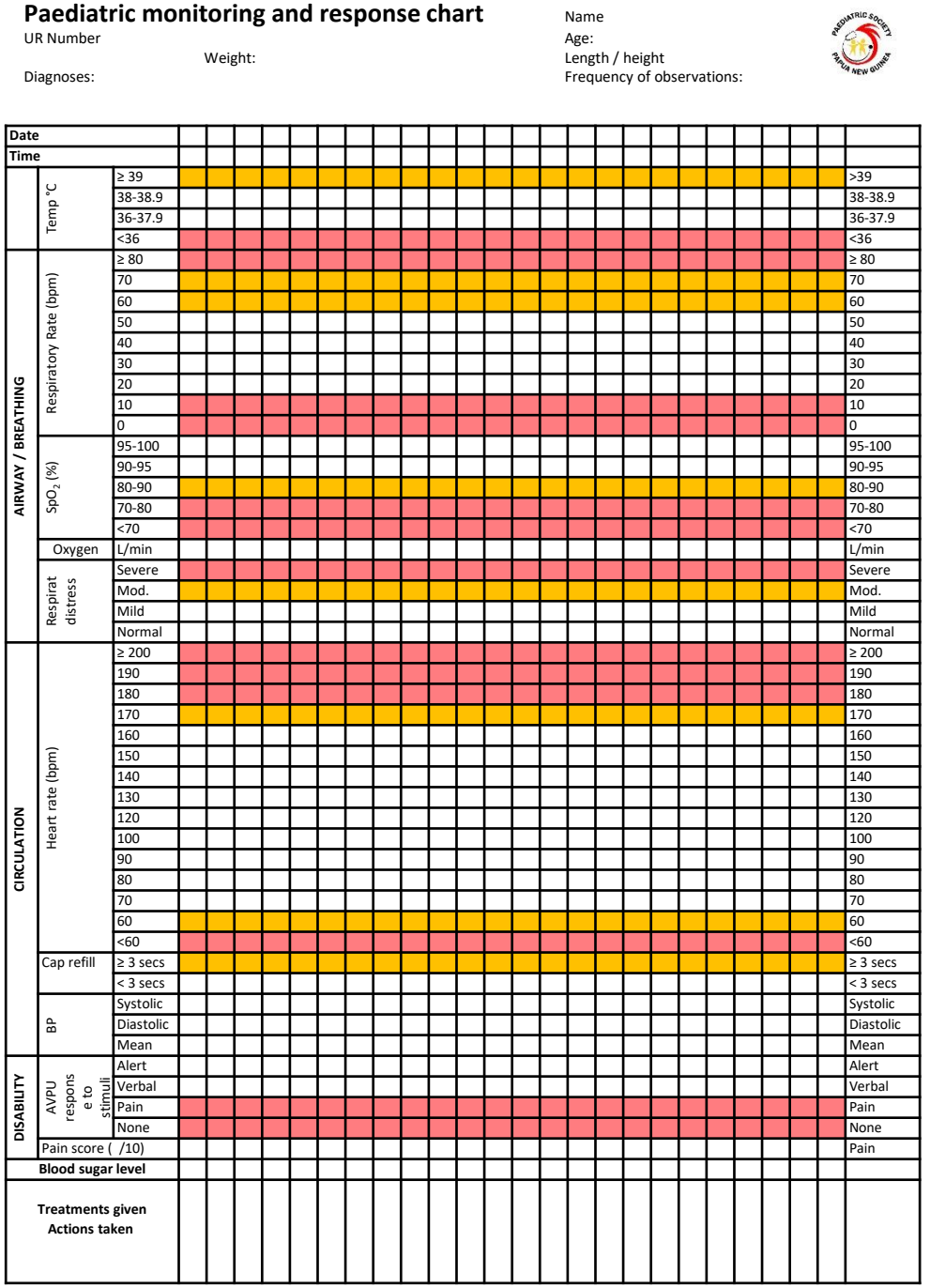
6. Arrived at base hospital 9am: heart rate 190/min, cyanosed, respiratory rate 70/min. No pulse oximeter or oxygen in CED. Taken to children’s ward at 9.45am.

What can be done?

- Oxygen and pulse oximeter in CED
- A MET system
- Monitoring charts
- Address oxygen, drug availability and staffing in district hospital
- Why was the child not vaccinated in the village



Paediatric monitoring and response chart

UR Number

Weight:

Diagnoses:

Name

Age:

Length / height

Frequency of observations:

Date																													
Time																													
	Temp °C	≥ 39																											>39
		38-38.9																											38-38.9
		36-37.9																											36-37.9
		<36																											<36
AIRWAY / BREATHING	Respiratory Rate (bpm)	≥ 80																											≥ 80
		70																											70
		60																											60
		50																											50
		40																											40
		30																											30
		20																											20
		10																											10
		0																											0
	SpO_2 (%)	95-100																											95-100
		90-95																											90-95
		80-90																											80-90
		70-80																											70-80
		<70																											<70
	Oxygen	L/min																											L/min
	Respirat distress	Severe																											Severe
		Mod.																											Mod.
		Mild																											Mild
		Normal																											Normal
CIRCULATION	Heart rate (bpm)	≥ 200																											≥ 200
		190																											190
		180																											180
		170																											170
		160																											160
		150																											150
		140																											140
		130																											130
		120																											120
		100																											100
		90																											90
		80																											80
		70																											70
		60																											60
		<60																											<60
	Cap refill	≥ 3 secs																											≥ 3 secs
		< 3 secs																											< 3 secs
	BP	Systolic																											Systolic
		Diastolic																											Diastolic
		Mean																											Mean
DISABILITY	AVPU respons e to stimuli	Alert																											Alert
		Verbal																											Verbal
		Pain																											Pain
		None																											None
	Pain score (/10)																												Pain
Blood sugar level																													
Treatments given Actions taken																													