GLOBAL YOUTH & CHILD HEALTH

a section of The Swedish Paediatric Society

Swedish Networks for GLOBAL HEALTH

Child Health

Key messages and knowledge gaps

Seminar 9 nov

How can Sweden contribute to global neonatal research?

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Presentation	Key message	Knowledge gaps
	KEYNOTE SPEAKERS	
Joy Lawn  **YouTube** **Research gaps in newborn health**	SDGs at halftime (2021): 0,29 millions maternal death at birth, 1,9m stillbirths, 2,3m newborns, 4,0m 1m-20y -> **~9 million deaths of women & children per year** 84 out of 134 million births globally are in low- and lower middle-income countries. **50m of those are now facility births** and great need and opportunity to improve care for those babies. **3 tips for global neonatal research** - Pick the big What? Pick the Big burden, measure the right things, leading to system change - How? Question is: what is the question? Think about right design. - Money talks! Be proactive with funders and not just reactive. Most important = TEAM **There is no I in "WE-SEARCH"** - > Research needs to be interdisciplinary "Unlike minds" get better results = teams beyond our "bubbles" <2% of published research has an African author and are not getting credit for research in their own context. Swedish institutions can empower researchers in LMIC through bilateral collaborations. **Preterm birth complications are the most common cause for child mortality**, and it is not decreasing. Preterm birth prevention has a flat line. This is a priority! Many important reports with new data released this year (Lancet series, Born Too Soon, BJOG vulnerable newborns, Lancet Preterm Birth Estimates). In high-income countries >90% of extremely preterm babies <28w survive, but in low-income countries <10% survive. Here is an opportunity for major rapid impact with CPAP and KMC having the highest impact in the bundle. Newborn care improvement demands for **complex interventions** or health systems package with great flexibility regarding context. A holistic system change package is found newborntoolkit.org	How to design a complex evaluation and study complex interventions and care packages in a feasible way. (NEST 360)? Detection and interventions of disability for children at risk. Screening and prevention of retinopathy of prematurity. In general, longer term follow-up in studies are needed to track disabilities. 2/3 of neonates who arrive at newborn care unit in Malawi are hypothermic, even though trying to make iKMC. How improve?

	Aid and research **funding for newborns is very low compared to burden** but needs to be spent smarter and show impact, then more money can come. Stillbirth research is especially underfunded (<2% of newborn research grants) and only 7% is spent in LMIC where 98% of burden is. Nearly 50% is granted to basic science and only 3% to implementation research. Dimensions.ai is the world's **biggest research funding database**. It collects all grants globally (>6 million grants) The **"package" of interventions can't be too complex**, then it is not scalable. It needs to contain enough to have impact, but if added advanced interventions -> risk to not reach out with the core interventions. WHO has guidelines and standards. Neonatal mortality rate (NMR) needs to reduce faster 3-10x in sub-Saharan Africa to reach SDG. High NMR >30 -> great reductions possible with public health measures and basic obstetric & newborn care. NMR <30 (majority countries) requires improved maternity & special neonatal care. Survivors of severe newborn illness **has great risk of sequalae and morbidity**, but often lack follow-up. With increased access but unsafe delivery of oxygen, we are generating **an epidemic of retinopathy of prematurity** in Africa without even measuring it. Focus on the major returns when advocating for investment. In Tanzania, potential gain of 8-10$ for every 1$ invested in newborn care, by averting mortality. We need to **advocate for more and better space** and more **human resources**. We need to collaborate with biomedical technicians and think about sustainability of devices introduced in projects. Target product profiles developed by UNICEF and NEST 360.	Implementation of blood culture and its uses to accurate antibiotic use, alarm of outbreaks and track hospital acquired infections. Research on drugs for newborns needed. Novel drugs, safe use of existent drugs, equitable access and use. Better tools for diagnostics are needed. Fast, easy, bedside tests. Eg. Great demand of alternatives to blood culture.
Stefan Swartling Peterson 	Neonatal mortality rate decrease less (1/3 reduction) than under 5-mortality (2/3) in the last 20 years (2022: 22/1000 live births) and **needs to decrease 2-3 times faster** to reach SDG target of 12/1000. **Facility births** in Uganda increased from **37% to 91% in 20 years**, but quality of care needs to improve. To significantly reduce newborn mortality, special care units are needed in every district as part of universal health coverage.	How to implement and scale up newborn care in a region using existing models and toolkits?

YouTube **Health systems for improved newborn health**	UNICEF/WHO published (2023) **a model to scale up care for small and sick newborns** with focus on both care and health system aspects. (ref) Together with the newborntoolkit.org are powerful instruments to implement and scale up newborn care. 50% of world **population is urban** today and is projected to be 70% by 2050. Health care services will be delivered by a mix of public and private providers. How to control and ensure quality of care? Early post-partum deaths can **be misclassified as stillbirths** and have great impact on mortality data interpretation, shown in a Ugandan study. Quality of data is important! More can be done to **prevent preterm birth** and newborn morbidity: - **Family planning** -> most effective to prevent newborn mortality and morbidity and there great unmet need. - 1/5 of births in Uganda are adolescent pregnancies and has increased during pandemic with high school drop-out rates among girls. Great potential for prevention. **Children needs to be kept in school!** - **Promote good diets** – work on food environments. People needs to be empowered to **demand better healthcare and hold decision makers accountable**. Reading tip: Flagship report of the **Alliance for Health Policy and Systems Research** - Systems for health: Everyone has a role.	How to find human resources for needed care units when scaling up and how to finance? How to strengthen parents to demand better care (social accountability)? How to strengthen family planning and provide it to women who demand it? How to strengthen data measurement and avoid misclassification of stillbirths?
Diane Gashumba  **YouTube** **Primary health care toward universal health coverage**	1 community health workers (CHW)/40 households -> the base of the health system in Rwanda **Aim to build 1000 health posts by 2030** – 213 constructed and 80 under construction. Walking distance to CHW or health post reduced to 25 min in half Rwanda. Majority of health posts and centres are managed by a **public-private partnership** with **a nurse entrepreneur** in the centre. Finance by Health insurance reimbursements (cover 90% of population and 90% of cost) and co-payments. Making investment in digitalisation. **Electronic medical record** allows for real time data from health posts. Drone deliveries (eg blood products).	

	Norrsken House in Kigali is an **entrepreneurial hub** promoting start-ups combining profit and positive global impact -> supports some nurse entrepreneurs To improve newborn health – one has to understand **the local culture and collaborate** with local culture	
	SHORT PRESENTATIONS	
Mats Blennow  **YouTube** **Knowledge gaps - WHO recommendations for care of preterm and small birth weight infant**	WHO **Guideline Development Group** (25 experts, MB one of them) published in 2022: WHO recommendations for care of the preterm or low-birth-weight infant. Provides an **evidence-based review** of different aspects regarding **preventive and promotive care**, care for complications and **family involvement** and support The guideline also identified **36 research questions** regarding effectiveness and how to implement interventions. Group participants voted and the following were the **top ranked knowledge gaps:** What strategies can be used **to increase family participation** in the care of their preterm or LBW infants? How can **exclusive breastfeeding** be promoted, supported and scaled-up for preterm or LBW infants? What is the effectiveness of **emollients?** What is the effectiveness of **continuous positive airway pressure (CPAP**) compared to **high flow nasal cannula** (HFNC) What is the effectiveness of **immediate Kangaroo Mother Care** (KMC) in improving mortality, morbidity, growth and neurodevelopmental outcomes for critically ill preterm or LBW infants? What is the effectiveness, safety, and feasibility of setting up **human milk banks** in LMRS? What is the effectiveness and safety **of probiotics** on mortality, morbidity, growth, immunological status, microbiome development, and neurodevelopmental outcomes in human milk fed preterm or LBW infants?	See left

Viveka Nordberg  YouTube **New strategies to identify virulent and multidrug resistant bacteria in neonates**	**Local surveillance** is a vital key to control **multidrug resistant (MDR**)- outbreaks. Treat the **right baby for the right bug** is the base of antibiotic stewardship Most diagnostic procedures for bacteria rely on **culture-based methods.** Molecular sequencing approaches: time-consuming and costly **New methods** to detect plasmids and presence of resistance genes can assist in managing MDR Three novel methods have been designed: PNA-FISH -> identifies virulent bacteria. 90 min Cut and stretch assay -> Find antibiotic resistance genes in plasmids. 90-120 min GBS - Vesicle biosensor -> Find GBS in vaginal specimen in birth giving mothers. 45 min. These **three, low cost, rapid tests are tools for**: outbreak detection, sepsis prevention, efficient antibiotic stewardship strategy These are **groundbreaking discoveries** that will contribute to the broader scientific community	Methods to find virulent bacteria without culturing New methods to detect plasmids and presence of resistance genes can assist in managing MDR Research and evidence to demonstrate the novel technology´s potential How to implement new techniques when available?
Ylva Ternström Blomqvist & Agnes Linnér  YouTube **Infant and family centred newborn care**	**Family centred care and its components are top priorities** by the WHO recommendations for care of preterm and small birth weight infant. Skin-to-skin or Kangaroo Mother Care (KMC) are one of the core components of family centred care has several benefits for the infant including earlier breastfeeding. KMC traditionally made after stabilization. More **recently evidence** has shown **feasibility and efficacy** of immediate KMC after birth during stabilization. We should aim for caring the mother and baby **without separation** – **couplet care.** The right to **parental leave** in Sweden is a great facilitator for family centered care At Uppsala Hospital the intent is to do all immediate and later **interventions needed skin-to-skin**, such as positive pressure ventilation, nCPAP, IVs, in-/extubation, ultrasound…. It is possible!	How to implement and scale iKMC in already overcrowded newborn wards in sub-Saharan Africa? How to decrease separation between mother and child?

	Hinders to skin-to-skin in Sweden are: breaks, baby clothes, cots, staff attitudes and medical equipment. **Facilitators** are: parental leave, parental beds, "bed-in-bed", staff attitudes, NICU design "What you do, you often will be good at"	
Thomas Drevhammar  YouTube **CPAP and respiratory support**	**CPAP** is included in the WHO recommendations for care of preterm and small birth weight infant. Aim is to provide respiratory support with **good quality** to an **affordable cost** and **user-friendly**. Focus of research should be to provide respiratory support with heating, O_2 control, high quality CPAP with appropriate interfaces, directly at birth, escalation and de-escalation of support **RAM – cannula** are popular in LMIC, but needs more evidence to be used safely. When conducting research with limited resources. **Where should we spend our time?** - Implementation - Optimal use of resourses - Trials comparing technologies and management	How to implement CPAP directly after birth? Can CPAP with RAM-cannula (long and narrow bores) provide equally efficient respiratory support compared to classic interfaces (wide and short bore)?
Ashish KC –  YouTube **Neonatal Resuscitation**	For an issue to be a global health priority, it depends upon **the issue** in, the **ideas** and solutions in place; **actors** in power and the **political context** which can drive the issue into better political and policy priority. Annual 6-14 million babies need resuscitation globally. **11% of all babies are "Non-crying"** after birth and half of those are also not breathing. The group "Not-crying but breathing" also have increased risk of mortality and brady/tachycardia Mean time to bag-mask-ventilation is **about 3 minutes**, despite guidelines urge to ventilate before 1 minute. Helping babies breathe can improve resuscitation skills but low dose-high frequency training required to maintain skill. Laerdal Liveborn is a monitoring system (heart rate, ppv, video) with AI guidance of resuscitation under development.	How implement sustainable frequent HBB-training in the clinical LIC setting? Can real-time guidance by AI or telemedicine tech improve skills and outcome of resuscitation?

	To put global newborn health on the political agenda, there is need for improved **media coverage,** more action by the **civil society** and **pressure groups** in Sweden **2/3** newborns do **not receive timely and effective resuscitation** globally ->**Poor Human capital** development Need to engage with **political actors** -> hold accountable -> **push for funding and action**	
Ola Andersson  **YouTube** **Sustained cord circulation – helps reducing anemia**	**Delayed cord clamping** (DCC) means that you sustain the intrauterine circulation of child after birth. **43% of children** under 5 has **anaemia** and 4 % of those have iron deficiency anaemia Major contributor to global burden of disease and most prevalent in small children. Cord clamping at **3 min -> 100 ml blood** transfer from placenta to child (70ml/kg->100ml/kg) Iron content in extra blood =what needed for 3 months growth >3 min cord clamping vs < 1 min -> 8% reduction anaemia and less development delay at 1y. DCC of >1 min decrease mortality with 36% and IVH 27%. WHO recommend to DCC for >1 min, but it is not enough! **>3 min is required for long term benefits.**	Any interventional study should include timing of CC – to know if intervention or CC gives effect¨ How to implement DCC >3 min? Is DCC during resuscitation feasible and effective?
Susanna Myrnerts-Höök & Nicolas Pejovic  **YouTube**	Effective and timely (within 1 min) positive pressure ventilation (PPV) of non-breathing babies is the core intervention in neonatal resuscitation, **but bag-mask ventilation** (BMV) can be a **difficult skill** leading to delay in PPV. Two meta-analyses (2022 and 2023) -> Laryngeal Mask Airway (LMA) vs BMV: : - **Decreased probability** of **failing** to improve **PPV** - **Decrease use** of endotracheal **intubation** - Reduced time to HR >100 No difference in survival or adverse events. Can safely be used by **midwifes** with brief training.	How can LMA use in resuscitation increase? Is smaller LMAs feasible, safe and effective in resuscitation <1500g?

LMA for resuscitation and surfactant delivery	**Surfactant** administration with LMA (**SALSA)** is a **less invasive** than intubation in preterms with respiratory distress syndrome (RDS) and: - At **least as effective** prevent mechanical ventilation as INSURE or CPAP in several smaller RCTs, >1000g. - Less sedation used, no laryngoscopy, no catheter pass vocal cords, easy to use - LMA sizes available limits its use to >1250-1500g. **But smaller LMAs are emerging.** **Planned trial in Vietnam** -> SALSA vs INSURE for babies >750g	Is LMA non-inferior to ETI in neonatal resuscitation? Is SALSA feasible, safe and effective in preterms <1500g? Is SALSA less painful than intubation?
Kristina Elfving  **YouTube** **Probiotics to low birth weight infants**	Two meta-analyses found probiotics to preterm low-birth weight infants associated with: - **reduced risk all-cause mortality**, severe **NEC**, time to full enteral (oral) feeds, days of hospitalization. (106 trials, n=25840). - **reduced risk of NEC and mortality** in the group very preterm/VLBW infants. Not enough data on extremely preterm/ELBW. (60 trials, n=11160) In **LMIC:** - RCT -> Synbiotic (*L. plantarum* and fructooligosackaride) **reduced mortality and/or sepsis** in term infants. (n=4556, India) - Meta-analysis -> **reduced risk** of NEC, late onset sepsis, and **all-cause mortality** compared placebo. (n=4783, 10 LMICs.) WHO recommendations: "**Probiotic may be considered** for human-milk-fed very preterm infants (<32 weeks gest)" **Planned trial in Rwanda** aim to study if: - Probiotic treatment versus placebo to low-birth-weight preterms reduces the composite outcome of mortality/sepsis and promote growth - follow-up 2y	Few trials in LIC and sub-Saharan Africa, where biggest disease burden exist. Can probiotics to low birth-weight infants in sub-Saharan Africa result in reduced mortality or sepsis? Can probiotics to low birth-weight infants reduce undernutrition at long term follow-up?
Panel discussion  **YouTube**	What is the important **WHAT?** - JL: One common goal -> That every child, wherever born has the same chance to survive and thrive, whatever is the context or system.	

How can Sweden best contribute to Global Neonatal Research?

Panel moderator:
Tobias Alfvén.

Panelists:
Joy Lawn
Diane Gashumba
Agnes Linnér
Ashish KC

- All need to think about the "diagonal approach" – We all need to do our "one thing" well -> think of how it fits the whole package of things -> deliver a strong health system -> otherwise the whole package will fail.
- Force the funders to also think diagonal.

- DG: To Focus on **global health in reality**, not only theory. Many researchers focus more on their publications and career, than on what really matters and therefore don't accomplish impact.

- AKC: **Co-operation**
  -> If we co-operate and convey a percentage of our knowledge to other actors like, media, politicians and pressure groups -> we would have larger fundings and real change faster.
  -> Also co-operation with other professionals (engineers, economics) will open doors, break boundaries and enable bigger impact

- AL: **Virtual ideas graveyard** -> Great ideas and research don't convey to action. More patience and persistence with implementation. When failing -> try another way and stay longer at the site.

Is there something we can learn from other Nordic countries?

- DG: Finland -> interested in bilateral exchange of health education for workforce
- When educating PhD-students there should be a sustainable path to further research and development leading to impact from research. More sustainability and accountability needed.

How can Sweden BEST contribute to global neonatal research? JL

- **We need to be smarter** -> Our research has the biggest impact (survival, human capital), but we are deficient in showing that.
- **Who funds what and why?** Be smarter https://youtu.be/n1vpAk5oZG0?si=vgspBZ98Nj0kyAS-about funding.
- **Parents – make their voices heard** and let them be angry and drive change
- Parliamentarians – Approach them, show them facts and results and give them their narrative

How can we make better studies with great impact? AL

- Clinical researchers: **Do what you are good at + understanding of how to design studies**
- Funding
- Get engaged politically as well – be better advocates for what we believe in

How can we reach out with our message? AKC

- **Create a narrative of why global newborn health is important** to society.
- Get your **story out of your bubble**: To health professionals, public health managers, media, civil society

- create platforms for interaction with politicians, media, civil society

What is the right question and how to ask it? JL

- What is the **biggest burden?** What are you **good at?** What can you **be paid to do?** What is **answerable** (evaluation design knowledge)?

How to address parliamentarians? JL

- They will only come out of parliament if they are going to win votes. **You have to go to them.**

Aim for an international health parliamentarian group (exist in UK) – convene on different topics

How to get global health at the spotlight at international conferences?

- JL: At jENS 2023 -> great focus on global health -> because funders approached presidents and demanded it
- Approach presidents directly and adovate for the agenda -> they want to "look good"
- **jENS wil make a joint statement about global health -> can be used for future advocacy!**

How to collaborate with US institutions and funders where a lot of money and know-how is?
DG: Instead of collaborating with US -> KI and other institutions in Sweden should open campus in Africa (like Harvard) -> it opens new availability of funds and great impact. Eg. French surgical centre, IRCAD, recently opened in Rwanda.

How are we going to sustain? Charity does not sustain things. **Who is going to pay?**

- Government?
- Poor people?
- Community fund insurance?
- Business -> profit or not-for-profit (some other needs to pay)

If we want to make sustainable action -> need to collaborate with business people. In the end -> money is in the industry -> we need to be smart and not naïve and find the good balance

In summary -> Sweden is too small

- ➔ We need to **work together** (**We-Swearch**!)
- ➔ Work with **parents**
- ➔ Work with **parliamentarians**
- ➔ Work with **people with money and power** in smart ways

Speakers

Joy Lawn
Professor of maternal, reproductive and child health at London School of Hygiene and Tropical Medicine with >30 years' experience. Lead several Lancet series on newborn health. Former Director of Evidence and Policy for Saving Newborn Lives/Save the Children.

Stefan Swartling Petersson
Professor of Global Transformations for Health at Karolinska Institutet and Health Specialist at UNICEF Sweden, former Global Chief of Health at UNICEF

Diane Gashumba
MD, MMed (Pediatrics) and Ambassador of Rwanda to the Nordic countries.

Mats Blennow
Mats is Professor emeritus in perinatal neuroscience at Karolinska Institutet, field work experience with Medecins Sans Frontier, Guideline Development Group for WHO recommendations for the care of preterm or low birthweight infants

Viveka Nordberg
Neonatologist at Karolinska Sjukhuset, Chair of the NGO Paediatric Health Initiative, PhD in neonatal infectious diseases with focus on antibiotic resistance.

Ylva Ternström Blomqvist
Paediatric nurse and associate professor at Uppsala University with research focus on infant family care and skin-to-skin.

Agnes Linnér
Neonatologist and head of neonatal department at Karolinska Huddinge. PhD on immediate skin-to-skin contact/KMC.

Thomas Drevhammar
Anaesthesiologist at Östersunds Sjukhus and associate professor at Karolinska Institutet with research focus on CPAP and respiratory support for neworns.

Ashish KC
Senior lecturer at Gothenburg University, previously associated with Uppsala University. Research focus on immediate newborn care. Advisor for Save the Children and UNICEF.

Ola Andersson
Neonatologist and associate professor at Lund University with research focus on delayed cord clamping and sustained cord circulation.

Susanna Myrnerts-Höök
Paediatrician, PhD in global newborn health. Postdoc at Karolinska Institutet with focus on neonatal resuscitation and care of the small and sick newborn

Nicolas Pejovic
Neonatologist, PhD in global newborn health. Postdoc at Karolinska Institutet with focus on neonatal resuscitation and care of the small and sick newborn

Kristina Elfving
Paediatrician, PhD and postdoc at Gothenburg University with research focus on infectious diseases and malnutrition.

Hosts

Olivia Brunell
Paediatric resident PhD in global neonatal health and treasurer of Global Youth and Child Health.

Mårten Larsson
Paediatrican and neonatal fellow, PhD-student in global neonatal health, and chair of Global Youth and Child Health.

Organizing team

This seminar was organized on the initiative of Global Youth and Child Health, a section of the Swedish Paediatric Society and the Swedish Network for Global Child Health. The organizing team members were: Mårten Larsson, Olivia Brunell, Johan Berg (secretary *Global Youth and Child Health), Ashish KC, Agnes Linnér, Ola Andersson, Susanna Myrnerts-Höök, Nicolas Pejovic, Tobias Alfvén and Karin Strömstedt Johansson (UNICEF Sweden).*

Seminar summarized by Mårten Larsson