

# Saving more lives - together

500,000 every year by 2020



Impact Update January 2018

LAERDAL



Photo Credit Md. Kabirul Abedin



## Building on Tayeeba's Story



I first met Tayeeba as a four-week-old survivor of birth asphyxia. She was with her mother, Rikta, and her birth attendant, Sakhina, who saved her shortly after participating in the Helping Babies Breathe

(HBB) program. Tayeeba's story inspired the many national trainers who gathered in 2012 for the rollout of the program in South East Asia.

Today, Tayeeba is a thriving five-year-old; over 500,000 birth attendants in 80 low-resource countries have participated in the program; and there are likely thousands of happy birthday stories like Tayeeba's.

This booklet reports on progress towards the goal Laerdal established in 2013: Helping save 500,000 more lives. Every year. By 2020. The word Helping is key. Laerdal does not save lives. Bystanders, first responders and healthcare personnel do when providing essential help in life-threatening situations. Our aim is to help those who educate and equip these lifesavers to be more effective in their work.

The alliance programs described on the following pages make us believe our ambitious goal is well on the way to being achieved. Underpinning these are the values and cultural traditions of our heritage, our people, the way we interact with the environment, and how we address evolving needs and opportunities.

Tore Lærdal, Chief Executive Officer

*“If we can create value to society at large and do our job well, satisfactory economic results will follow and allow us to build a stronger company with time.”*

Åsmund S. Lærdal  
Founder



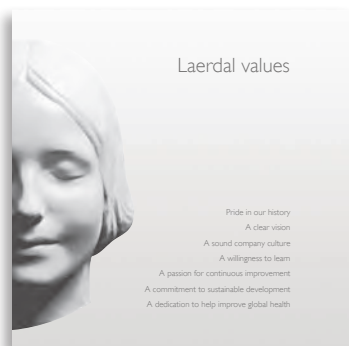
## Heritage

Åsmund S. Lærdal’s simple philosophy quoted above was from February 1940 when he established his business in Stavanger as a publisher of cards and books, and later toys. It remains Laerdal’s philosophy today. With an eye for innovation, Åsmund recognized the potential for using his expertise in producing plastic dolls for a new purpose - the development of a realistic training manikin to teach mouth-to-mouth resuscitation.

Over the subsequent decades, Laerdal has developed a broad range of products and programs to support healthcare education and emergency interventions. With a growing focus on patient safety, new ground was broken in the field of medical simulation with the introduction of a series of realistic patient simulators, allowing for risk-free interactive training.

### Laerdal today

Today, Laerdal is a global company with about 1,500 employees in 24 countries, dedicated to Helping Save Lives. It has remained family-owned with a long-term dedication to its mission. In 2010, Laerdal Global Health was established as a separate not-for-profit company to develop high impact, affordable products to help save lives at birth in low-resource countries.

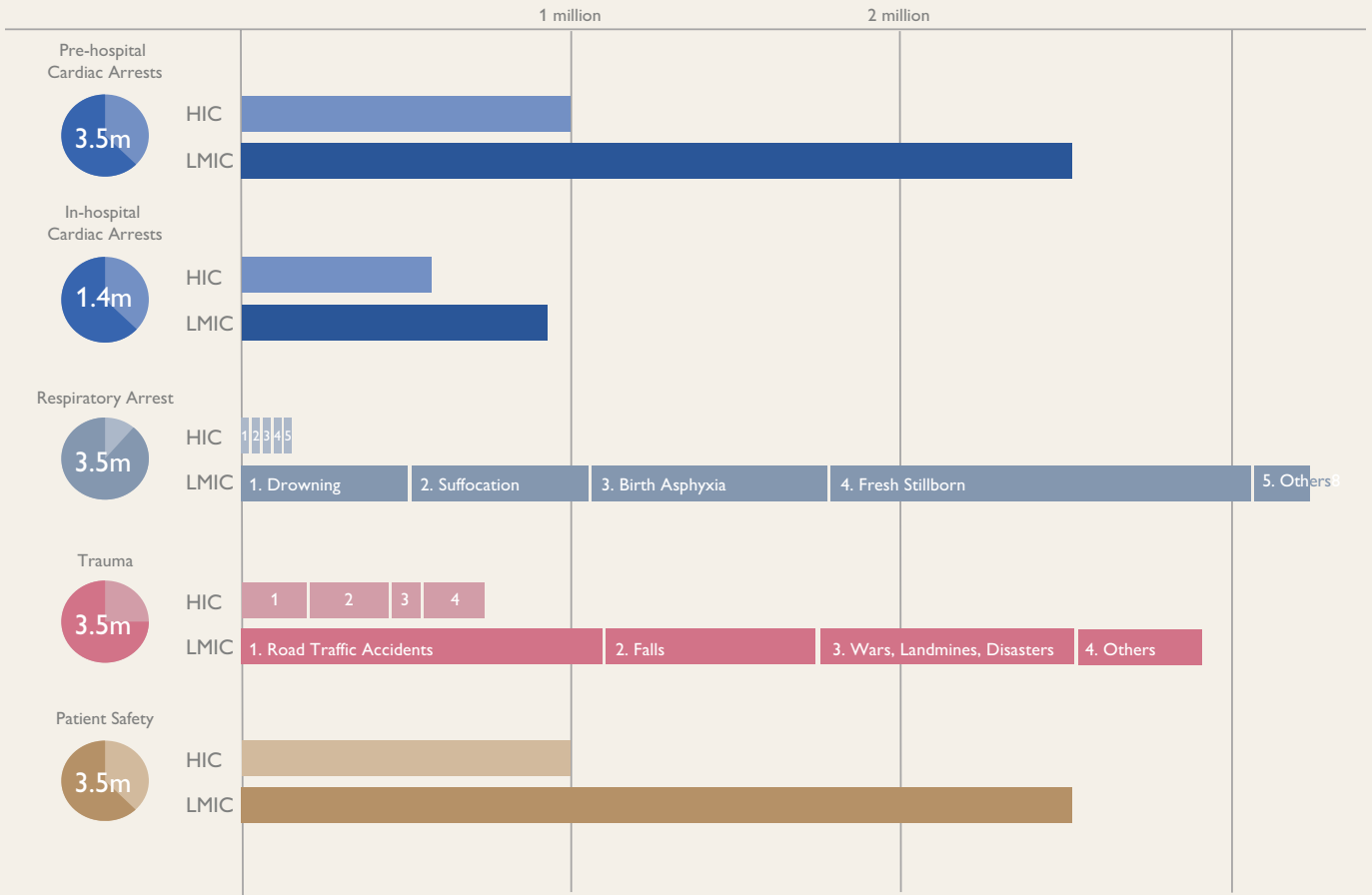


### Laerdal Values

- an ability to listen
- endless curiosity
- practical problem solving
- respect for the customer
- hard work and a passion for continuous improvement

## More to be done

Significant opportunities for helping save more lives remain to be addressed, especially in low- and middle-income countries. The graph below illustrates the relative death toll of leading categories of sudden death.\*



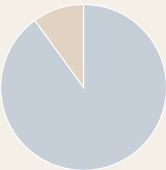
\* For references see [www.laerdal.com/references](http://www.laerdal.com/references)

## Measuring Success

The following “balanced scorecard” visualizes how the two parts of Laerdal, Laerdal Medical and Laerdal Global Health, contribute to a sustainable mission-oriented organization offering value by complementary means.

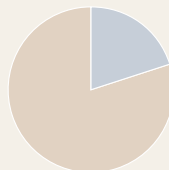
### Financial Results

Sales



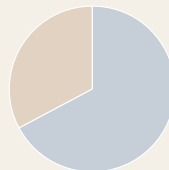
### Mission Achievement

Lives Saved



### Other Factors

Employee Motivation



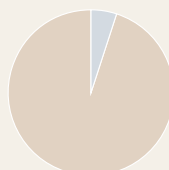
Laerdal Medical

Laerdal Global Health

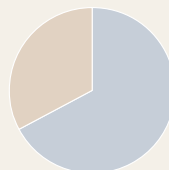
Operating Results



Life-years Saved



Brand Equity



Performance according to this balance scorecard is assessed annually by the Laerdal Board of Directors on which three Laerdal employees are seated.



Greater Copenhagen has a register of 5,000 AEDs. The location of any AED less than 180 seconds transport from the site of the caller automatically comes up on the dispatcher screen (red dots in middle screen).



Similar apps to the HeartRunner in Denmark have been introduced in several other places, including Singapore, Stockholm, Gothenburg and many US cities.

## Mobilizing the Community

Denmark has become a prime example of implementing best resuscitation practice in Europe, and has achieved a remarkable tripling of survival from pre-hospital cardiac arrest over the past ten years. A national cardiac arrest registry was introduced in 2003. Since 2006, a national school Cardiopulmonary Resuscitation (CPR) training program has been underway, sponsored by Trygfonden, a national Danish foundation. 17,000 Automated External Defibrillators (AEDs) have been placed in the community. A research program has helped measure and improve implementation. Key representatives of all five Emergency Medical Services (EMS) systems in the country participated in a national Resuscitation Academy in the Autumn of 2017, and committed to specific follow up actions – progress will be reviewed at a national meeting in May 2018.

The latest development is the introduction of the HeartRunner app to activate volunteer laypersons trained in CPR and AED use to respond to cardiac arrests in their neighborhood. 16,000 citizens joined the system within the first two months. When receiving a suspected cardiac arrest call, the dispatcher alerts immediately all HeartRunners that at that time find themselves within 300 m distance from the location of the caller. Any Heartrunner able to respond can then confirm this on the app and will receive exact address and directions on a map on their mobile phone. The dispatcher is also able to inform the responder of all AEDs available within the same 300 m radius with the push of a button.



Recent advances in CPR training include quality improvement through technology-facilitated feedback.

In the UK, there are about 30,000 out-of-hospital resuscitation attempts every year with less than 10% of victims surviving, equivalent to 50 survivors per million population. In 2014, the British Heart Foundation (BHF), the leading independent funder of cardiovascular research in the UK, established The Nation of Lifesavers program to improve outcomes, setting a target of training 5 million people in CPR by 2020. To achieve this, they partnered with the Resuscitation Council (UK), ambulance trusts, community groups, schools, and Laerdal and other companies. The BHF is well on track to achieve their target with over 3 million people trained to date including 1.2 million in 2017 alone. This is approximately 5% of the UK population, with an exceptional reach into more than 50% of UK secondary schools.

## Sarah's Story

Sarah was a pupil at Prendergast School in Lewisham, a suburb of London. On 29th May 2016, her dad collapsed with a cardiac arrest at home. Sarah, who had learnt CPR at school knew what to do, dialed 999 and began CPR. She cradled the phone between her ear and shoulder; her arms were aching; she was sweating; but she kept going, saying "I don't want my dad to die!". She told her mum to calm down and directed her to do rescue breaths.

She continued to do CPR for about ten minutes until the paramedics arrived and took over. Sarah's dad is now fit and well after a heart operation.

### Restart a Heart Day

*Sarah's story was featured by the BHF in their promotion of Restart a Heart Day, a European Resuscitation Council initiative held in October every year. On that day in 2017, a remarkable 195,000 young people were trained in CPR in the UK alone.*



# Mobilizing the First Resuscitation Team



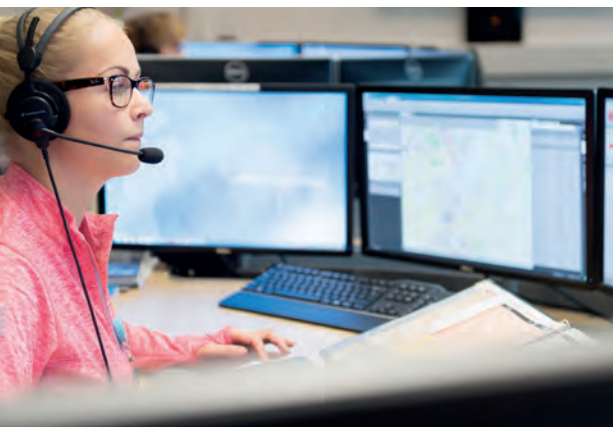
*Role playing as caller and dispatcher is becoming an important part of CPR training.*

Around 70% of all cardiac arrests occur in the home where family and friends can become lifesavers. CPR training alone is not enough, since only one of three who are CPR trained will initiate CPR when facing cardiac arrest. The combination of CPR training in the community plus professional help over the phone, so-called Telephone CPR (T-CPR), is the best strategy. And, with the widespread use of mobile phones, T-CPR is practical almost everywhere. Bystander CPR rates in Seattle, Arizona, Sweden and Norway are now above 70%, and are increasing rapidly in Singapore, Korea, and Denmark. T-CPR is taking place in two-thirds of these cases.

This “first resuscitation team”, the caller and the dispatcher, is key to success in Korea. Survival is increasing, and CPR before ambulance arrival is now initiated by the dispatcher in 80% of cases. Laerdal helped with dispatcher training in 2013, and in 2014 partnered with Seoul National University Hospital and Seoul Metropolitan Government to develop a complementary community CPR Training program. Called HEROS, it prepares the bystander for interacting with the dispatcher. Singapore has a similar story: following dispatcher training in T-CPR, they implemented T-CPR linked training for lay people through the DARE program. Their recent annual report shows great progress in community CPR rates and the number of survivors has more than doubled over three years.

Asian countries have a burden of sudden cardiac arrest similar to countries in Europe and the USA, but most of them have just started to develop programs and initiatives for CPR before ambulance arrival. These are now accelerating with initiatives such as HeartRescue in India and China, and the formation of the Asian Association for EMS. Laerdal is supporting the Pan-Asian Resuscitation Outcomes Study (PAROS), the primary goal of which is to improve outcomes from out-of-hospital cardiac arrest across Asia.

These successes inspired a national campaign in Norway called “Sammen redder vi liv” (Saving lives together). The goal is to increase annual survival from out-of-hospital cardiac arrest by 200 lives per year from 50 to 90 per million population, and most of the potential comes from optimizing CPR quality by the first resuscitation team.



*“Telecommunicators are the true first responders and a critical link in the cardiac arrest chain of survival.”*

*T-CPR recommendation  
by the American Heart Association*





## Stein's Story

Unusual sounds from her husband, Stein, wakens Berit. She tries to wake him, but no response. A sensation of fear builds in Berit. Something must be wrong. She decides to call the emergency services for help.

"Is he conscious? Is he breathing normally?" These key questions define the help that Stein will receive. Berit is not confident enough to do CPR, and decides to waken Sondre, their 18-year-old son. Sondre had recently been CPR trained, and, guided by the dispatcher, he performs life-saving CPR until the ambulance arrives and takes over. Today, Stein is thriving and has resumed running marathons.



*“Where you live should not determine if you’ll live”*

Mickey Eisenberg

*Founder and Director of the Resuscitation Academy Foundation*

### Best Practice

to Improve Cardiac Arrest Survival\*

- 1 Cardiac arrest registry
- 2 Telephone CPR for more and better CPR
- 3 High performance EMS CPR
- 4 Rapid dispatch
- 5 CPR performance data
- 6 First responder AED programs
- 7 Smart technologies to expand CPR and Public Access Defibrillation
- 8 CPR/AED training in schools and the community
- 9 Accountability
- 10 Work towards a culture of excellence

\*Global Resuscitation Alliance  
<http://www.globalresuscitationalliance.org/ten-programs/>

## Spreading Best EMS Practice

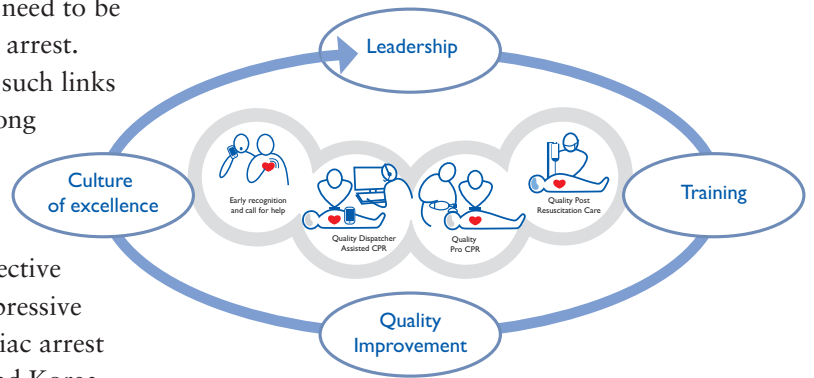
According to one study, survival from out-of-hospital cardiac arrest in the US ranges from 3% to 16%. Since the resuscitation guidelines based on the medical science are now essentially universal, this disparity in survival is attributed to differences in quality of education and implementation of what has been shown to work.

The Resuscitation Academy was started in King County, Seattle in 2008 to provide a forum for US Emergency Medical Services (EMS) systems to learn from best practice. It is now an independent educational foundation. Nearly 1,000 EMS leaders have attended Resuscitation Academy programs. Building on this groundbreaking work, three initiatives have been launched to both deepen and broaden its impact:

- **Global Resuscitation Alliance**  
 In June 2015 at the Utstein Abbey near Stavanger, Norway, 36 EMS leaders from around the world convened to address the challenge of how to implement best EMS practice. This resulted in a call for the establishment of a global consortium, the “Global Resuscitation Alliance”, which has since conducted workshops in Korea, Japan, Singapore, China, Australia, Norway, Sweden, Denmark, Switzerland, and the UK.
- **Resuscitation Academy Foundation, American Heart Association (AHA) and Laerdal Alliance**  
 This Alliance is committed to creating turnkey EMS programs to help improve implementation efforts. These cover System Assessment, Dispatcher CPR training, Resuscitation Quality Improvement for individual resuscitation skills, and High-Performance CPR for Teams. Piloting begins in five communities in Q1 2018, three in the US and two internationally.
- **Global Resuscitation Alliance Spreading to Low- and Middle-Income Countries**  
 For many years, Sudden Cardiac Death (SCD) was considered a consequence of lifestyle that related to high-income countries. There may be around one million SCDs in these countries. Today we know that SCD is also a big and growing issue in low- and middle-income countries, where the World Health Organisation (WHO) estimates the death toll from SCD may be at least 2.5 million per year. In response to this, an expert meeting to discuss steps to improve survival in these countries through improved EMS systems was held in Singapore in August 2017. These are now being followed up in South East Asia, China, and India.

## The Frame of Survival

The “Chain of Survival” is a concept that for 30 years has focused communities on the key activities which need to be linked together to improve survival from cardiac arrest. It is now evident that to maximize the impact of such links they need to be embedded in a framework of strong leadership, systematic refresher training and a quality improvement system, all bound together by a culture of excellence. This is now being referred to as the “Frame of Survival”. Effective implementation of this Frame has resulted in impressive increases in survival rates as documented in cardiac arrest registries in King County in Seattle, Denmark, and Korea.



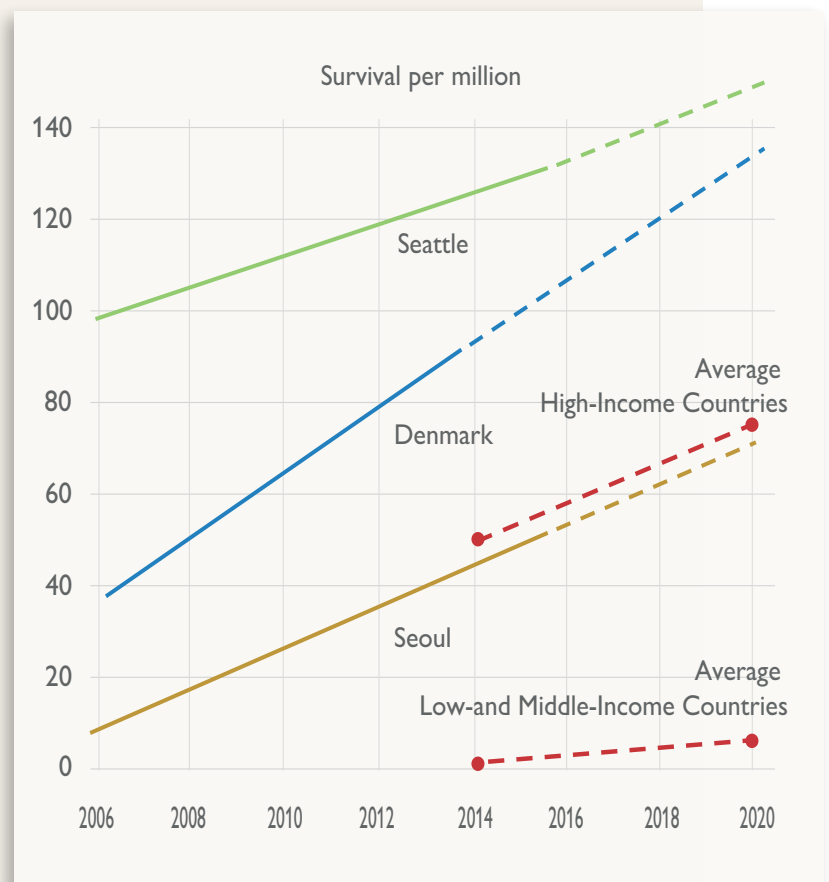
### Impressive Increases in Survival

The graph\* shows survival from out-of-hospital cardiac arrest in Seattle, Denmark, and Seoul, leading EMS systems in their respective world regions, for the periods from 2006 through to 2014-16. The three systems are all founding members of the Global Resuscitation Alliance (GRA) and focus on adopting best EMS practice for improving survival.

Their results are impressive, showing almost doubling of survival in Seoul and tripling of survival in Denmark over ten years. The dotted lines indicate a further 50% increase of these survival numbers by 2020 by continuing the trends.

Several studies indicate that the average survival from cardiac arrest among EMS systems in high-income countries may be at a similar level as in Seoul, i.e. around 50 per million population (/m). Assuming these EMS systems adapt the GRA ten best practice steps, survival could increase 50%, i.e. to around 75/m in 2020. This is the goal set by the GRA, and would amount to 35,000 additional survivors per year.

In low- and middle-income countries, where 82% of the global population live, the situation is dramatically different. Very few witnesses of a cardiac arrest are trained to recognize and respond to such an emergency, the dispatch systems are not well established, and the ambulances (if at all available) typically arrive too late and with poorly-trained and poorly-equipped personnel. As a result, current survival may be as low as 1/m. By modest implementation of best practice, an increase in survival from 1 to 6/m by 2020 should be achievable, saving another 35,000 lives per year.



\* For references see [www.laerdal.com/references](http://www.laerdal.com/references)

# Revolution in Health Care Quality

*“This is probably the most exciting and important project that has come up in the AHA over the last twenty years, and it may be so also for the next ten years”.*

*Nancy Brown*

*CEO, American Heart Association*

Laerdal has been a strategic alliance partner of the AHA for development of CPR and Emergency Cardiac Care education since 2006.

The goal of the RQI project is to have 90% of US hospitals enrolled in the Program by 2025.

## Doubling Survival from In-hospital Sudden Cardiac Arrest

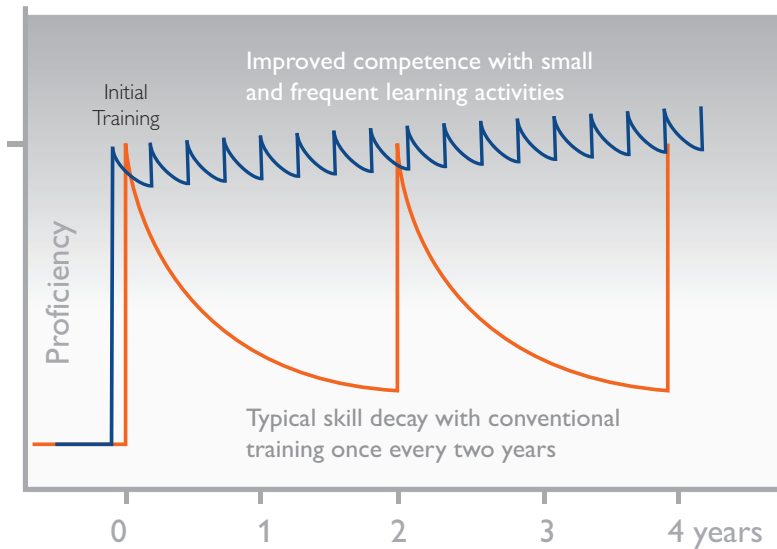
For decades, healthcare providers have typically been undertaking Basic and Advanced Life Support training once every one to two years. However, over recent years, researchers have shown that resuscitation skills deteriorate quickly, often in three to six months after training. To help maintain and improve these important lifesaving skills, Laerdal has collaborated with the American Heart Association (AHA) to develop the Resuscitation Quality Improvement (RQI) program. This program enables learners to practice their skills every three months in small sessions of 10 to 15 minutes, without an instructor present.

Early reports show significant improvement in quality, compliance, cost - and above all - patient survival. At one of the early adopters, Texas Health Presbyterian Hospital in Dallas, survival doubled in the first year. These results have led the AHA to suggest that a typical RQI implementation could help save an additional ten lives per year per hospital. With 5,400 acute care hospitals in the USA, Laerdal and AHA believe that



*The system provides feedback of value both for student coaching and for accreditation.*

full adoption of RQI can help save 50,000 additional lives per year in US hospitals alone. Since introduction, approximately 300 hospitals in the US have adopted the RQI program, involving over 300,000 learners.



*“Poor-quality CPR should be considered a preventable harm”*

2013 AHA Consensus Statement on Quality CPR.

**Low-dose, High-Frequency Refresher Training\***

This method of training has the major advantage of more value and increased competence for less money. Instead of incurring the cost of sending healthcare providers away from the workplace for courses, learning occurs as a part of normal, daily activities with the added advantage of being fully in context. Thus, both improved patient care and good return on investment result.



\* For references see [www.laerdal.com/references](http://www.laerdal.com/references)

## Best Practice

to make Simulation effective \*

- 1 Facilitated debriefing
- 2 In situ refresher training
- 3 Distributed practice
- 4 Curriculum integration
- 5 Clinical variation
- 6 Range of difficulty
- 7 Individualized learning
- 8 Multiple learning strategies
- 9 Defined outcomes
- 10 Valid simulator

*\*Technology-enhanced Simulation for Health Professions Education. A Systematic Review and Meta-analysis. JAMA 2011, Vol 9, 978-88*

## Improving Nurse Education

In 2015, the US National Council of State Boards of Nursing (NCSBN) published a recommendation that high-quality simulation could substitute up to 50% of clinical practice across the nursing curriculum. A recent study showed that 96% of all accredited nursing schools in the USA use simulation in some form, but also that many have challenges meeting the best practice guidelines.

To address this gap, the US National League for Nursing (NLN) and Laerdal developed the Simulation Education Solutions for Nursing (SESN) program. To date, SESN is implemented in over 100 schools across the US, with highly encouraging results.

## Preparing nurses for clinical practice

Many hospitals do not have an efficient and effective program to onboard new nurses. This can impact patient safety. 75% of new nurses in a US study were observed to commit medication errors. Nurses not feeling prepared and confident are more likely to leave their job. 34% of new nurses do so in the USA by the end of their second year. The cost of replacing nurses is high, and patient safety is also affected by this high attrition.

The NLN and Laerdal have also partnered to develop the Accelerating to Practice program. This is a blended learning program, using peer-to-peer training, e-simulation and hands-on team simulation training. Performance data is captured and aggregated in an analytics platform. This helps hospitals assess and quality assure that new nurses are competent and confident before starting to care for patients.



**National League  
for Nursing**

## Helping Strengthen Nurse Education in China and India

In 2017, in collaboration with the NLN, the Ministry of Education in China developed a multi-year plan to introduce simulation-based education in several hundred nursing schools. A similar initiative is under discussion with the Nursing Council and the Ministry of Health in India. Expert panel presentations on the opportunity for simulation education were held at the 2017 world congresses of both the International Confederation of Nurses and the International Confederation of Midwives.



## Ashley's Story

Newly out of residency, Ashley van der Zee Ormsby RN, BSN, had no idea late one evening that she would be relying on her simulation training to ensure a patient's very survival. The patient, just from emergency surgery, suffered a pulmonary embolism that sent him into cardiac arrest.

Crediting an identical case in her simulation training at Children's Hospital, Washington State University, Ashley called a code, took the lead, and directed the delivery of CPR for 30 minutes. The patient survived.



## Patient Safety

Since the landmark 1999 “To Err is Human” report by the US Institute of Medicine, there has been increased attention on patient safety, i.e. the treatment of patients in a safe environment and protected from avoidable harm. Both initial training and continuing medical education are prerequisites for establishing a safe environment for patient care.

Johns Hopkins University researchers in Baltimore, USA, have estimated recently that as many as 250,000 may die annually in USA hospitals due to medical errors. Globally, this figure may be two to four million. However, medical errors occur not only by doing something incorrectly, but also by failing to act promptly.

Simulation-based training and refresher practice were identified in the “To Err is Human” report among the key measures to enhance patient safety. Continuing medical education and maintenance of competence of healthcare providers are essential, particularly in promoting better team interaction and communication making a “team of experts into an expert team”.

## SAFER Simulation Center

SAFER was established in 2006 as a collaboration between Stavanger University Hospital, University of Stavanger and Laerdal to improve patient safety and strengthen competence among employees of these partners. Over 250 facilitators are active in running more than 50 educational programs for nursing and medical students, personnel from all departments of the hospital, and others. In 2017, SAFER logged over 14,000 participant days, with 1/3 of these being in-situ simulation at the hospital. SAFER is one of more than one thousand patient simulation centers in operation today worldwide.



Nurse training



Maternal & Newborn



Emergency Care & Trauma



## Patient Safety Movement

The Patient Safety Movement (PSM) was established in 2012 with a mission to Reduce Preventable Deaths from Medical Errors to Zero by 2020.

The PSM has established fifteen Actionable Patient Safety Solutions (APSS) including Neonatal Safety, Optimal Resuscitation, Airway Safety, and Obstetric Safety.

Over 3,500 hospitals, 40% outside the US, have now committed to these APSS, with a total goal of preventing 150,000 deaths from medical errors in 2018. These include commitments by Laerdal of helping save 25,000 more lives in 2018 by simulation-based educational programs including - with its partner the American Heart Association - 5,000 more lives by the Resuscitation Quality Improvement Program.

## Safe Surgery and Anaesthesia

According to the Lancet Commission on Global Surgery, five billion people, i.e. two thirds of the global population, are without access to safe and affordable surgery and anaesthesia. In 2016, Laerdal became a Global Impact Partner of the World Federation of Societies of Anaesthesiologists (WFSA). And in September that year, the Laerdal Foundation awarded the WFSA a grant to introduce the Safer Anaesthesia from Education (SAFE) programme over a two-year period in four more countries: Tanzania, Bangladesh, Nepal and Zambia.

The WFSA has been working closely with partner institutions as well as member national societies, in particular the Association of Anaesthetists of Great Britain and Ireland (AAGBI), to support delivery of the program.



*Courtney Lindley, Simulation Coordinator - Children's Hospital of Atlanta (right)  
Nora Colman, Critical Care Fellow - Children's Hospital of Atlanta (left)*

## Every Life Campaign

In 2017, Laerdal launched its Every Life campaign to collect stories from healthcare institutions on how simulation-based training may be used to improve patient safety.

To date, over 200 institutions have joined this initiative, and their stories will be shared to inspire others. For every story submitted, Laerdal is making a donation to the National Patient Safety Foundation.



## Optimizing in-hospital stroke treatment

For stroke patients, door-to-needle time is critical. Every 15-minute decrease equals one month additional disability-free life. To minimize this time, Stavanger University Hospital, Norway, started weekly, multidisciplinary team training focusing on communication, diagnostics, handover and management. They simulate the whole patient pathway, from ambulance to cath lab. After only a few months, they have managed to reduce the door-to-needle time from 29 to 14 minutes – a result that is among the best in the world.

## Best Practice

Implementation of Helping Babies Survive and Helping Mothers Survive programs\*

- 1 Secure Ministry of Health buy-in
- 2 Form a working group for planning, training and monitoring
- 3 Develop national roll-out plans, for pre-service and in-service training, in both public and private sector
- 4 Provide learning materials & equipment at time of training
- 5 Identify and support local leaders and champions
- 6 Establish low-dose, high-frequency refresher training
- 7 Establish facility-level quality improvement teams
- 8 Monitor performance
- 9 Establish a system for reporting and feedback
- 10 Engage healthcare providers, families and the broader community

\* <http://journals.plos.org/plosone/article?id=10.1371/journal.pone.0178073>

## Helping Mothers and Babies Survive

Since the establishment of Laerdal Global Health in 2010, Laerdal has been a dedicated member of the Helping Babies Breathe (HBB) alliance. Studies from Tanzania, Nepal, Uganda, and Ghana show this program may help reduce early newborn mortality by 50% and fresh stillborn by 25%. When well implemented throughout low- and middle-income countries, the alliance believes HBB has the potential to save about half a million babies' lives per year.

The success of the HBB program has catalyzed the development of three more educational programs for saving newborns by the American Academy of Pediatrics (AAP), and four additional programs for saving mothers by Jhpiego, an affiliate of Johns Hopkins University. Together these programs address over three quarters of the about 300,000 mothers and at least three million newborns who die unexpectedly every year. Even when policies are in place, practices may be far behind evidence-based guidelines. There is a real need to improve the quality of services, especially in health facilities as institutional deliveries and care-seeking for sick children increase in many countries.



**Survive & Thrive** is a public-private partnership including US pediatric, obstetrics and gynecology and midwifery organizations, the private sector, Save the Children, Jhpiego, USAID and others. The partnership collaborates with international and national professional associations and global health scholars to strengthen maternal, newborn and child health (MNCH) programs through training, quality improvement approaches, effective technologies, and evaluation. The partnership has also mobilized and equipped members of professional associations to improve the quality of high-impact MNCH interventions in health facilities.

**Helping Babies Survive (HBS)** is a hands-on suite of training modules developed by AAP and based on the latest WHO guidelines. These modules address the main causes of neonatal mortality and morbidity and include: Helping Babies Breathe, Essential Care for Every Baby, and Essential Care for Small Babies.

**Helping Mothers Survive (HMS)** is a suite of simulation-based training modules developed by Jhpiego and endorsed by global professional organizations such as the respective world federations for midwives, obstetricians and gynecologists, and nurses, as well as the United Nations Population Fund. The modules include Bleeding After Birth on prevention and management of post-partum hemorrhage, Pre-eclampsia and Eclampsia on clinical decision making and rapid treatment, and Threatened Pre-term Birth on preparing for and preventing preterm birth using antenatal corticosteroids.

### 25 Million Safer Births

The Helping Babies Survive and Helping Mothers Survive Programs have now reached over 500,000 birth attendants in low- and middle-income countries, primarily in healthcare centres. Assuming these birth attendants attend on average 50 deliveries per year, this will have contributed to 25 million safer births annually. Laerdal has provided simulators which can be used not only for the initial training, but are so affordable that they can also be acquired by rural health care institutions to enable frequent refresher training.

300,000 mothers and 3,000,000 newborns die unexpectedly each year.

HBB has the potential to save about 500,000 babies' lives per year.

American Academy  
of Pediatrics



DEDICATED TO THE HEALTH OF ALL CHILDREN™

Since 2005, Laerdal has been an alliance partner of the American Academy of Pediatrics (AAP) in developing training solutions for their Newborn Resuscitation and Pediatric Basic and Advanced Life Support Programs. These programs have reached over 4 million healthcare providers in 130 countries.

The alliance has resulted in the development of several simulators supporting the Newborn Resuscitation Program (SimBaby, SimNewB, and Premature Anne) as well as e-simulation programs.



Jhpiego is a non-profit health organization affiliated with Johns Hopkins University, Baltimore, USA, operating in over 150 low- and middle-income countries to prevent the needless deaths of women and their families. Laerdal has partnered with Jhpiego and others in developing a suite of Helping Mothers Survive educational programs, and has also developed culturally-adapted and highly-affordable birthing simulators to enable these programs to be scaled up in over 60 countries.

*survive & thrive*

Laerdal Global Health is a founding member of this alliance initiated in 2012 by USAID, and encompassing professional health associations, and private sector and non-profit partners.

The alliance works with national governments and healthcare professionals to improve health outcomes for mothers, newborns and children, and has been instrumental in scaling up the Helping Babies Breathe and Helping Mothers Survive educational programs.

## Bundling Programs and Products

Laerdal has developed a series of highly affordable simulators in support of the Helping Babies Survive and Helping Mothers Survive Programs. These solutions are also relevant for high-income countries for use in low-dose, high-frequency training.

### Antenatal Care

### Labour Management



**Pre-eclampsia & Eclampsia**  
addresses the second leading cause of maternal mortality.



**Threatened Preterm Birth**  
focuses on identifying women likely to deliver a preterm baby and the actions that can be taken prior to birth.



**Normal and Prolonged Labour**  
focuses on how to ensure what starts out as a normal birth remains normal.



MamaBirthie



MamaNatalie



BabyBirthie

The training programs, bundled with hands-on training products help healthcare workers gain knowledge, experience and confidence in handling a wide range of complications occurring before, during and after birth.



**Birth**                      **Postpartum Care**                      **Newborn Care**



**Helping Babies Breathe**  
teaches the initial steps of neonatal resuscitation to save lives and give a much better start to many babies who struggle to breathe at birth.



**Bleeding after Birth**  
teaches active management of the third stage of labor, and early detection and basic management in order to reduce maternal deaths caused by post-partum hemorrhage.



**Essential Care for Every Baby**  
**Essential Care for Small Babies**  
teach essential newborn care practices to keep all babies healthy from the time of birth to discharge from the healthcare facility.



NeoNatalie, Upright bag-mask and Penguin suction



MamaNatalie



PremieeNatalie and Nifty feeding cup



### From Training to Survival

Transition from training to clinical outcome is particularly dependent on local ownership and follow-up of the initial training with low-dose-high-frequency refresher training.

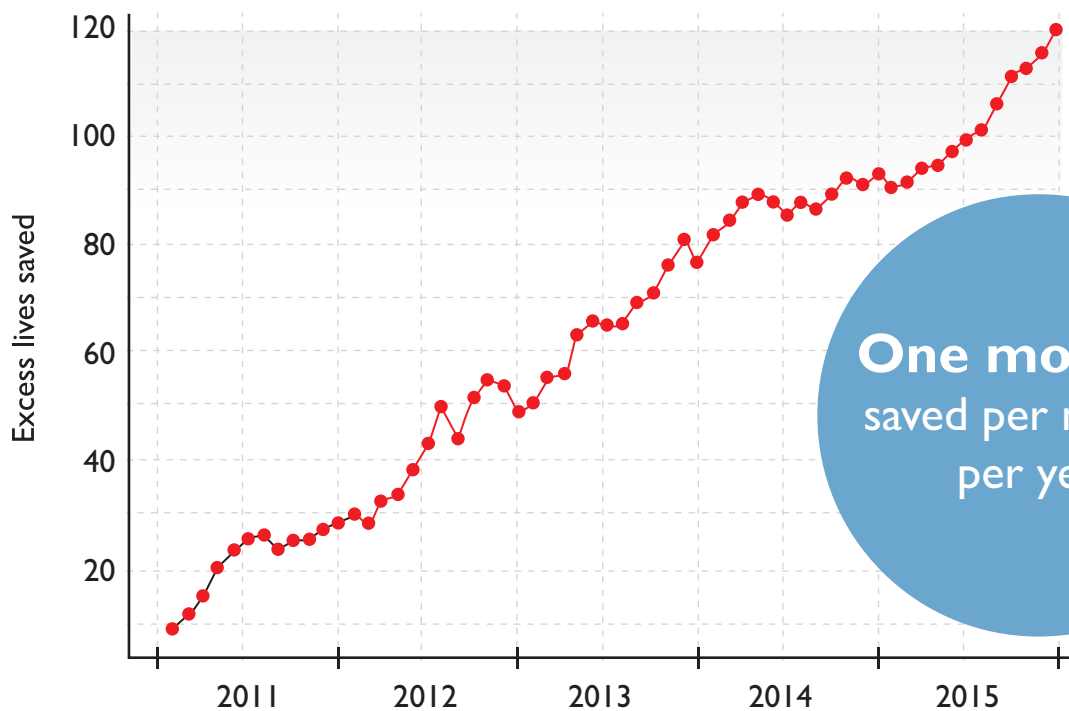
In the Safer Births research program at the Haydom Lutheran Hospital in rural Tanzania, more than 30,000 deliveries have been closely monitored and evaluated over a six-year period. This has engaged 10 PhD students and resulted in four innovations adapted to local needs to make regular refresher training more accessible while improving care at birth. The number of infant deaths dropped from 181 in 2014 to 90 in 2015.

The combination at Haydom of Helping Babies Breathe (HBB) and Safer Births has resulted in 120 additional newborn lives being saved between 2011 and 2016: corresponding to one more life per midwife per year.\*

\* For references see [www.laerdal.com/references](http://www.laerdal.com/references)



The **“Safer Births Bundle”** developed for the Safer Births project comprises the Moyo Fetal Heart Rate Monitor; the NeoBeat Newborn Heart Rate Meter; the Upright Bag-Mask Resuscitator with peep valve, and the Advanced NeoNatalie Newborn Model with adjustable lung compliance and heart rate function.



### From 10,000 to 50,000 Happy Birthdays

In 2014, Laerdal started a collaboration with the International Confederation of Midwives (ICM) launching “10,000 Happy Birthdays” to scale up the Helping Babies Breathe and Helping Mothers Survive programs in two pilot countries, Malawi and Zambia. These programs have now been introduced in all nurse/midwifery schools by the two national midwifery associations, and the goal of educating 10,000 birth attendants has been achieved.

A recent study of the effect of these programs implemented in Uganda by Jhpiego and AAP shows a highly positive impact on reduction of newborn mortality and postpartum hemorrhage.

In 2017, based on the positive results of the pilot programs, ICM announced a Call for Proposals for additional countries to take part in the program, with the aim to report on 50,000 Happy Birthdays at the ICM world congress in Bali in 2020. Ethiopia, Tanzania and Rwanda have been selected to join Malawi and Zambia in the next phase of the program.

### Scale-up of Essential Life-Saving Commodities

Helping Babies Breathe was listed as one of ten breakthrough innovations for recommended further scale-up in a report from PATH, an international non-profit organization. This was presented in September, 2013 by the then Secretary General, Ban Ki-moon, to the United Nations General Assembly. By early 2018, over 500,000 Penguin Suctions, 250,000 Bag-Mask Resuscitators and 125,000 NeoNatalie Newborn Simulators have been distributed.

### Family Planning 2020

More active family planning is essential for ensuring healthy lives by reducing maternal and newborn mortality and providing access to sexual and reproductive healthcare services. A two-year spacing between births may also help reduce maternal deaths by a third and child deaths by 10%.

India will contribute to its “Family Planning 2020” program by providing contraceptive services to 48 million new users and in turn prevent 1 million infant deaths and over 42,000 maternal deaths by 2020. At the request of, and in close collaboration with, the Indian Ministry of Health and Family Welfare, Laerdal has designed an affordable, portable, modular training solution for wide-scale intra-uterine contraceptive device insertion. The product was launched in June 2017.



*Training in post-partum IUCD insertion*



## Supporting Research

In addition to Laerdal's own research, the company contributes to research through donations to the Laerdal Foundation for Acute Medicine, which was established in 1980 in collaboration with the University of Oslo.

To date, the Foundation has supported 1,800 research projects. Among these were 25 expert meetings held at the Utstein Abbey outside Stavanger, Norway, on recommendations for evaluation and reporting on various aspects of emergency medicine and education. The latest meetings have focused on best practice implementation of pre-hospital resuscitation programs and on the Helping Babies Survive and Helping Mothers Survive programs.

The Foundation has also provided significant support to eight centers of excellence in the USA and Europe for better validation of simulation-based education, and to the development of the Norwegian Medical Index for dispatcher assistance to the caller in emergencies.

Since 2010, the Foundation has provided annual grants totaling NOK 40 mill (USD 6.7 mill), and has earmarked 50% of future grants for projects related to saving lives at birth in low-resource settings.





Improving Survival from Out-of-Hospital



### A Call to Establish a Global Resuscitation Alliance



To date, 25 expert meetings have been held at the Utstein Abbey. Two meetings held in 2015 established ten steps for best practice for implementation of programs relating to sudden cardiac arrest and Helping Babies and Mothers Survive, respectively.

December 2008, 7(6):147-149

ELSEVIER ScienceDirect

CLINICAL PAPER

### Recommended guidelines for reporting on emergency medical dispatch when conducting research in emergency medicine: The Utstein style

M. Castrén<sup>a,1</sup>, R. Karlsten<sup>b</sup>, F. Lippert<sup>c</sup>, E.F. Christensen<sup>d</sup>, E. Bovim<sup>e</sup>, A.M. Kvam<sup>f</sup>, J. Robertson-Steel<sup>g</sup>, J. Overton<sup>h</sup>, T. Kraft<sup>i</sup>, L. Engerstrom<sup>j</sup>, L. Garcia-Castrill Riego<sup>k</sup>, The Emergency Medical Dispatch expert group at the Utstein Consensus Symposium 2008<sup>l</sup>

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Received 17 April 2008; received in revised form 18 June 2008; accepted 10 July 2008

**KEYWORDS**  
 Emergency Dispatch; Emergency Medical Dispatch

**Summary**  
 Objective: To establish a written framework describing the content and organization of emergency medical response centers and the process of emergency medical dispatch (EMD) systems connected to calls from dispatch in emergency medicine and prehospital care.

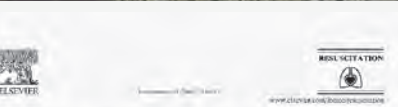
RESEARCH ARTICLE

### Successful implementation of Helping Babies Survive and Helping Mothers Survive programs—An Utstein formula for newborn and maternal survival

Hugh L. Erdahl<sup>a,\*</sup>, Melissa Singhal<sup>b</sup>, Georgina Mamo<sup>c</sup>, Aubrey KC<sup>d</sup>, Santorino Datta<sup>e</sup>, Heather T. Moyer<sup>f</sup>, Chelsea L. Evans<sup>g</sup>, Jeffrey Smith<sup>h</sup>, Jeffrey M. Perman<sup>i</sup>, Susan Halperin<sup>j</sup>, on behalf of the participants in the Utstein consensus process: How to implement successful Helping Babies Survive and Helping Mothers Survive programs?

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**Abstract**  
 Globally, the burden of disease and illness is still unacceptably high at the day of birth. Annually, approximately 300,000 women die related to childbirth. 2.7 million babies die within their first month of life, and 2.6 million babies are stillborn. Many of these fatalities could be avoided by better care and support. It is an opportunity, around the world, to harness the talents and competencies to manage life-threatening complications around the time of birth. Thus, the innovative Helping Babies Survive (HBS) and Helping Mothers Survive (HMS) programs emerged to meet the need for more practical, low-cost, and low-tech simulation-based training. This paper provides users of HBS and HMS programs a 10-point list of key implementation steps to create a program, applying to improved survival of mothers and babies. The list evolved through an Utstein consensus process, involving a local group of international experts within the field, and can be used as a means to guide programs in resource-limited countries. Successful implementation of HBS and HMS training programs requires cultural competence, readiness, and follow-up to ensure local accountability and ownership. Each country has to identify its own gaps and address realistic service delivery standards and patient outcome goals depending on available financial resources for dissemination and sustainability.



Cardiac arrest and cardiopulmonary resuscitation outcome reports: update and simplification of the Utstein templates for resuscitation registries. A statement for healthcare professionals from a task force of the international liaison committee on resuscitation (American Heart Association, European Resuscitation Council, Australian Resuscitation Council, New Zealand Resuscitation Council, Heart and Stroke Foundation of Canada, Inter-American Heart Foundation, Resuscitation Council of Southern Africa)

Law Jacobs, Vinay Nadarim, Jan Hahn, Robert A. Berg, John L. Hill, Jan Honnert, and Cassan, Adnan, Corradi, Katz D, Long, Judith, Finn, Henry, Hagerlin, Anthony, Havelby, Johan, Hecker, Robert, Hecker, Alan, Hirsch, Walter, Kivicki, Gregory, Laatz, Lars, Mary, Elizabeth, Mason, Tim, Mason, Gregory, Mears, Kenneth, Mortenson, William, Montgomery, Peter, Murray, Graham, Nishid, Terry, Nolan, Karan, Okada, Jeffrey, Perlman, Michael, Shuster, Peter, Adams, Steve, Linn, Stez, James, Libbals, Sergio, Inamura, Tama, Roth, David, Zideman

Setting a Research Agenda for Simulation-Based Healthcare Education: A Synthesis of the Outcome From an Utstein Style Meeting

B. Barry Hoogberg, MD, Charlotte Yeggin, MD, PhD, Doris Chew, MD, DMS, Peter Cackroon, MD, Dip. Psych.

Although the use of simulation as a methodology for training continues to grow at a rapid pace throughout all of healthcare professions and disciplines, research in this field is still at an early stage. Consequently, this article reviews and synthesizes current research in this field to provide a practical, actionable framework for researchers in this field. The authors aim to address the need for a research agenda in this field that is relevant to the needs of healthcare professionals. The authors review the current state of research in this field and identify key areas for future research. The authors also discuss the importance of simulation-based research in this field and provide a research agenda for this field. The authors conclude that simulation-based research is a valuable tool for healthcare professionals and that it should be used to improve patient care and outcomes.

ELSEVIER Resuscitation

Cardiac arrest and cardiopulmonary resuscitation outcome reports: update and simplification of the Utstein templates for resuscitation registries. A statement for healthcare professionals from a task force of the international liaison committee on resuscitation (American Heart Association, European Resuscitation Council, Australian Resuscitation Council, New Zealand Resuscitation Council, Heart and Stroke Foundation of Canada, Inter-American Heart Foundation, Resuscitation Council of Southern Africa)

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### Selected SDG 3 Targets

3.1: By 2030, reduce the global maternal mortality ratio to less than 70 per 100,000 live births.

3.2: By 2030, end preventable deaths of newborns and children under 5 years of age, with all countries aiming to reduce neonatal mortality to at least as low as 12 per 1,000 live births and under-5 mortality to at least as low as 25 per 1,000 live births.

3.4: By 2030, reduce by one third premature mortality from non-communicable diseases through prevention and treatment and promote mental health and well-being.

3.6: By 2020, halve the number of global deaths and injuries from road traffic accidents.

3.7: By 2030, ensure universal access to sexual and reproductive health-care services, including for family planning, information and education, and the integration of reproductive health into national strategies and programmes.

3.c: Substantially increase health financing and the recruitment, development, training and retention of the health workforce in developing countries, especially in least developed countries and small island developing States.

*The UN published a report in 2017 on the global progress towards reaching the SDG3 goals, available on [sustainabledevelopment.un.org/sdg3](https://sustainabledevelopment.un.org/sdg3)*

## Evolving Needs & Opportunities

The United Nations (UN) Sustainable Development Goals (SDGs), illustrated by the color wheel, present a common roadmap to a healthier, greener, fairer and more inclusive society by 2030.



Laerdal supports the SDGs: its mission is particularly relevant to SDG 3, Good Health and Well-being, with a focus on solutions to improve the quality of education of healthcare professional, first responders and the general public. SDG 4 (Quality Education), SDG 9 (Innovation) and SDG 17 (Partnerships) are also relevant for mission implementation.

Laerdal is working closely with a number of alliance partners and user groups to make sure that new solutions are thoroughly addressing real needs and are implemented globally.



SDG 4 targets include substantially increasing the number of adults with relevant employment skills. Such quality education is the cornerstone of Laerdal's approach to achieving the SDG 3 targets.



SDG 9 stresses the importance of industrial innovation. Laerdal has multidisciplinary and customer-focused teams to ensure developments are driven by life-saving and business potential.



SDG 17 emphasizes the importance of partnerships between governments, the private sector and civil society in achieving a successful sustainable development agenda.

Laerdal is also a member of the UN Global Compact which encourages businesses worldwide to adopt sustainable and socially responsible policies, and to report on their implementation. The Global Compact covers ten principles in the areas of human rights, labor, environment and anti-corruption. These principles will be addressed on the following pages.

#### HEALTHCARE TRENDS

- Patient safety focus
- Improving quality of care
- Ageing population
- Personal health tracking
- Decentralized systems
- Shortage of providers
- Cost containment

#### LIFESAVING OPPORTUNITIES

- Implementation partnerships
- Impact-centered business models
- Continuous learning platforms
- Integrated simulation solutions
- Data-driven decision support
- Accelerating clinical readiness
- Remote coaching of care
- Measuring to Improve

#### EDUCATION TRENDS

- Peer-to-peer learning
- Self directed learning
- Rapid feedback loops
- Just-in-time refreshers
- Mobile/remote learning
- Adaptive learning
- Scalable solutions

The figure above identifies the healthcare and education trends that are presenting significant lifesaving opportunities. Laerdal is proactively exploring and adapting evolving technologies to meet these needs. For users, this includes augmented /virtual reality; cloud-based data capture for feedback and learning management systems; and machine learning to predict individual maintenance of competence needs and give advice to emergency healthcare personnel. For development and manufacturing processes, it includes automation, digitalization, 3D printing, and new cloud-based customer resource management and business systems.

In 2016, Laerdal adopted a new development process with multidisciplinary and customer-focused teams working together with partners and users to secure design and implementation of optimal needs-based solutions.





### An Integrated Mission

An ongoing research project by the two researchers, Steven W. Whiting from the University of Central Florida and Alexander M. Sandvik from the Norwegian School of Economics, confirms that the mission in Laerdal is well embedded and offers real value.

**Impact on Individual Employees:**  
The research underlines that the extent to which an employee believes in and finds meaning in Laerdal's mission significantly correlates with self-reported job satisfaction and supervisor-reported performance.

**Impact on Leaders:**  
They found a positive correlation between a leader's mission-derived motivation and the extent to which their followers say they put their customers and team members first.

**Impact on Customers:**  
The research collected survey reports from Laerdal customers and matched these reports to the surveys of the salespeople who interact with those customers. Salespeople who reported higher levels of pro-social motivation were rated as more trustworthy by their customers than salespeople with lower levels of pro-social motivation.

# People

## Recruiting with Mission in Mind

Laerdal employees' understanding of the company's mission, knowledge of its strategy and their engagement for their work are key for delivering impact to customers and partners.

The study described on the left, underlines the need for recruiting people with a strong commitment to the mission as well as a strong professional knowledge for the job they are doing.

It is known from this study that the company's mission is particularly important as a source of motivation that impacts employee well-being and performance. This creates a true "win-win" for both achievement of the mission and the employees' job satisfaction. However, the results also highlight the responsibility of Laerdal's leadership to cultivate the mission in a sincere and honest fashion.

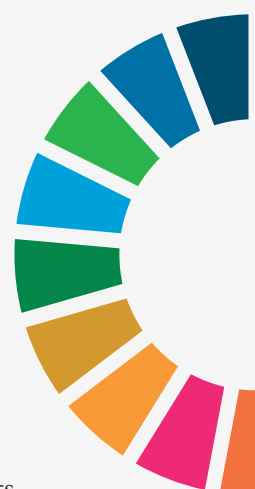
## Performance Management

The Performance Management Process in Laerdal is a regular dialogue between the manager and employee about work tasks, areas of responsibility, priorities, goals and competence development. In 2017, performance, competence development and learning were integrated into one system to simplify the process for managers and employees.

The goal is to increase individual accountability for personal development; and to meet more effectively strategic needs and increase the number of internal talents.

## Employee Motivation

Laerdal conducts annual surveys to understand the perspective of employees on questions of importance for the organization, including values, leadership, strategic understanding, and business alignment. In 2017, 84% of employees took part in the survey. It is encouraging that the respondents report that they understand the corporate strategy and are very confident on how they can contribute to achieving the company's goals.



88% I understand my work helps achieve the Company Strategic Goals.

85% I feel confident we can achieve the goal of helping save 500,000 lives.

87% The Laerdal mission has a personal meaning for me.

Average scores on a scale of 1-100 to some questions in the 2017 Employee Survey

### Gender Balance in Workforce

Attention on gender workforce balance has been increased in recent years to broaden Laerdal's talentpool and better reflect its users and their needs. At present, 46% of the 1,500 employees are women. In leadership roles, 36% are women, so we have room for improvement in certain areas of the business.

Women in workforce among total 15,00 employees worldwide.

46%

Women in leadership roles among 243 leaders worldwide.

36%

### Diversity in Workforce

An important area of attention is ensuring equal opportunities. Operating in 24 countries underlines the ethnic and cultural diversity within the Laerdal workforce. In Norway, 40 nationalities are represented amongst 400 employees. For Laerdal, this diversity helps to build more cultural awareness, better sensitivity for differences and a broader competence base.



The sales and marketing leadership in Asia Pacific.

### Supplier diversity

The Laerdal manufacturing plant in Suzhou, China, partners with a local Chinese company, Ruolin, where all of the manufacturing workers have some kind of disability, ranging from hearing or visual impairment to other physical and, mental disabilities. Ruolin stresses that this type of employment is not done for charity but because they believe it helps to deliver good business results.



## Ethical Standards

Laerdal believes in only doing business with those who embrace and demonstrate high standards in accordance with its Code of Conduct. Internal processes provide a good platform to ensure all employees understand and live up to the standard defined in the Code of Conduct.

### Fighting Corruption

In the Sustainability report in 2016, corruption problems in China were described. To avoid a repetition of such problems, Laerdal has introduced improved contracts and better training of employees and leaders.

### Whistleblowing

Transparency is important to secure an environment free of harassment and corruption. On the Laerdal internal website, a whistleblower line provides an important channel for reporting if the working environment falls short of the Laerdal values.

I understand the key elements in the Laerdal Code of Conduct.

88%

I apply the Laerdal values when faced with job related ethical dilemmas.

86%

I have personally not experienced bullying at work during the last 6 months.

85%

Average scores on a scale of 1-100 to some questions in the 2017 Employee Survey



# Environment

## Laerdal Code of Conduct on the Environment

Business and industry policies and operations can play a major role in reducing impact on use of natural resources and the environment. Laerdal is committed to doing business in an environmentally responsible manner throughout its entire manufacturing and distribution chain and network. To minimize adverse effects, Laerdal utilizes environmentally compatible materials and manufacturing processes wherever feasible.

Laerdal has established a process to ensure compliance with global environmental regulations both internally and at suppliers' locations. The Laerdal Code of Conduct on the Environment defines the company's position on minimizing adverse effects.

We have mapped the CO<sub>2</sub> emissions from operations in areas such as distribution, manufacturing and business travel since 2010. The data show an increase in overall emissions of 10% from the baseline year of 2010. In the same period net sales have increased by 25%, meaning the ratio of emissions to activities has been reduced. Over the years, energy consumption at manufacturing sites has been reduced, as has reliance on air freight in the supply chain except to the Asia Pacific region.

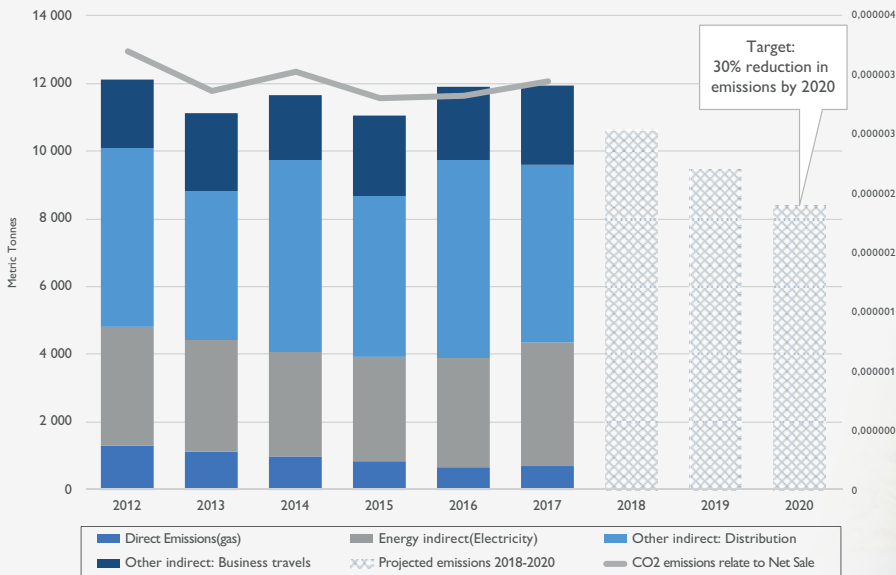
## Emissions From Traveling

One area of concern is the emissions from business travel. Laerdal has invested in communication equipment to encourage effective cross-border collaboration. However, there is a need to maintain customer intimacy and cultural sensitivity towards external partners and colleagues in 24 countries, which requires some face-to-face contact.

However, the desired improvements have not been achieved over the last two years. After considering opportunities and alternatives for reduction, a target has been set of reducing emissions by 30% by 2020. Projects and initiatives in 2017 give confidence that this ambition can be achieved.



Overall Corporate Emissions 2014 - 2020



### Asia Pacific Distribution Hub

With Laerdal’s growing sales in emerging markets in the Asia Pacific region, there has been an increase in the emissions from high use of air freight into the region. To reduce this use of air freight, in 2017 a new regional Distribution Center was established in Shanghai to serve the whole of the region. We expect a 20% reduction in our CO<sub>2</sub> emissions as a result of this initiative.

### Environmental Waste

Over the years, for environmental reasons, Laerdal has resisted the temptation to develop single-patient-use products except where unavoidable. Instead, we have developed reusable and durable solutions, and actively explored opportunities and invested in creating digital solutions. In 2017, we established Laerdal Bangalore to scale up the efforts in Copenhagen and Stavanger to grow our portfolio of digital solutions.

There has been a 20% reduction in manufacturing waste from 2016 to 2017. One of the drivers has been product design changes to reduce scrap.



### Investing in Solar Power

To help reduce our environmental footprint, Laerdal plans to invest in a solar power solution in 2018 at our US factory in Gatesville, Texas. A 282 kW solar power system will be installed on the roof of the factory. When in operation it will generate approximately 400Mwh per year, offsetting more than 50 % of our electricity consumption.

### Laerdal and GRI Standards

The table contains page references to Global Compact Principles and relevant performance indicators from the GRI Standard. Both indicators and scope of indicators are chosen based on the degree of materiality to Laerdal’s sustainability performance. The reporting is related to 2016/17.

Global Compact	GRI Standards
<b>Principle 1 and 2, Human Rights</b>	412-2, page 28 412-3, page 28 and 29 413-1, page 26
<b>Principles 3-6, Labor</b>	102-8, page 28 and 29 202-2, page 29 404-3, page 28
<b>Principles 7-9, Environment</b>	305-1, page 30 305-2, page 30 305-3, page 30 305-5, page 30 and 31
<b>Principle 10, Anticorruption</b>	102-16, page 29 102-17, page 29 205-2, page 28 and 29



*At Laerdal, we work towards a future where no one should die or be disabled unnecessarily during birth or from sudden illness, trauma or medical errors. Our solutions are used for quality education and therapy in emergency and critical care.*



**Laerdal**  
helping save lives



**Laerdal**  
helping save lives