



Dow Home, Institutional and Personal Care Solutions

Breakthrough to World Challenges

Breakthrough Collaboration: Dow and Unilever

Lifebuoy™ Soap Featuring POLYOX™ Water-Soluble Polymers



I. Executive Summary

At the start of the 21st century, nations from around the world came together and agreed to the United Nations Millennium Development Goals¹ – a set of eight key targets in critical areas for humanity, from eradicating extreme poverty and hunger, to achieving universal primary education.² Among them was the goal to “Reduce Child Mortality” – seeking to dramatically reduce preventable and needless deaths of children under the age of 5. In the year 2000, one out of every five children born – 20% of the world’s newborns – would likely die before their fifth birthday.

Although good progress has been made during the past 14 years, nearly 2 million children under the age of 5 still die each year of infectious diseases – especially pneumonia and diarrhea – with more than 80% of these deaths occurring in sub-Saharan Africa and South Asia.³ For the most part, these children and their parents do not have reliable access to effective treatments, appropriate nutrition, safe water and adequate sanitation facilities.⁴

Fortunately, there is one approach to prevention that likely is every bit as powerful as the newest pharmaceuticals and top-drawer medical care: a bar of soap.

Research shows that hand washing with soap can be a highly effective tool for preventing hygiene-related illnesses:

- Hand washing with soap at critical times – before eating or preparing food and after using the toilet can reduce the risk of diarrhea by 45%.⁵
- Hand washing with soap can reduce the incidence of acute respiratory infections (ARIs), such as pneumonia, by 23%.⁶
- Hand washing with soap by mothers and birth attendants was associated with a 40–45% reduction in neonatal mortality in Nepal.⁷
- Hand washing with soap is an effective control measure in pandemics such as severe acute respiratory syndrome (SARS)⁸ and Pandemic Flu.⁹ Several studies carried out during the 2006 SARS outbreak suggest that washing hands more than 10 times a day can cut the spread of the respiratory virus by 55%.¹⁰



Washing hands with soap is an important preventative measure against hygiene-related illnesses that kill millions of children under the age of 5 each year. Photo credit: UNICEF Cambodia

¹ UNICEF, “Unfinished Business, Achievable Goals,” Fulfilling the Health Agenda for Women and Children, the 2014 Report, page 3.

² <http://www.un.org/millenniumgoals/>

³ Levels and Trends in Child Mortality, Report 2012, Estimated Developed by the UN Inter-agency Group for Child Mortality Estimation.

⁴ “Fulfilling the Health Agenda for Women and Children,” page 3.

⁵ Unilever, Hand Washing Fast Facts, quoting CHERG 2010: “Water, sanitation and hygiene for the prevention of diarrhea,” Int. Journal of Epidemiology, Sandy Cairncross, Caroline Hunt, Sophie Boisson, Kristof Bostoesn, Val Curtis, Issac CH Fun, and Wolf-Peter Schmidt.

⁶ Unilever, Hand Washing Fast Facts, quoting Rabie, T and Curtis, V. “Handwashing and risk of respiratory infections: a quantitative systematic review,” Tropical Medicine and International Health, 11(3), 258-267.

⁷ Unilever, Hand Washing Fast Facts, quoting Victor Thee, et al., “Maternal and Birth Attendant Hand Washing and Neonatal Mortality in Southern Nepal,” Pediatric Adolescent Medicine, 2008; 162 (7): 603-608.

⁸ Unilever, Hand Washing Fast Facts, quoting Fung, I.C.-H and Cairncross, S., “Effectiveness of handwashing in preventing SARS: a review”, Tropical Medicine and International Health, 11(11), 1749-1758.

⁹ Unilever, Hand Washing Fast Facts, quoting Jefferson T., et al. (2008), “Physical interventions to interrupt or reduce the spread of respiratory viruses: systematic review.” BMJ, 336, 77-90.

¹⁰ Unilever, Hand Washing Fast Facts, quoting Ed. Jameson, et al., 2006. The World Bank, Washington, D.C., National Institutes of Health.

The U.S. Centers for Disease Control (CDC) confirms that hand hygiene is the first line of defense against a pandemic, the common cold, the flu, SARS, food-borne illnesses, and other infectious diseases. Adherence to proper hand hygiene is proven to prevent outbreaks in healthcare facilities, reduce transmission of antimicrobial resistant organisms, and reduce overall infection rates.¹¹

Handwashing with soap is a “do-it-yourself vaccine” that helps prevent infections and saves lives.

Because it prevents the transmission of so many pathogens and disease agents, it may be more effective than any other single vaccine in the world.

The United Nations Children’s Fund (UNICEF) estimates that diarrhea kills one child every 30 seconds. The World Health Organization (WHO) estimates that diarrheal infections claim the lives of 1.87 million children under the age of five each year. Scientific research shows that hand washing with soap prevents disease in a more straightforward and cost-effective way than any single vaccine: the simple act of washing hands with soap can significantly cut the risk of diarrhea by 45%¹² and that of respiratory tract infection by 23%.¹³

In addition, hand washing is:

- **A formidable ally** in efforts to combat a host of other illnesses, such as helminthes (worms), eye infections like trachoma, and skin infections like impetigo. Hand washing is also a preventive measure against influenza, including H1N1 and the SARS-causing coronavirus.
- **Cost-effective:** The isolation and safe disposal of feces and the provision of adequate amounts of clean water are essential, but hand washing with soap is one of the most effective and least expensive ways to prevent diarrheal diseases.

Diarrheal disease

Diarrheal diseases are often described as water-related, but they are more accurately excreta-related since the pathogens come from fecal matter. These pathogens make people ill when they enter the mouth via hands that have been in contact with feces. Handwashing with soap breaks the disease cycle. The effectiveness of hand washing with soap for reducing diarrheal illness has been compared to other interventions.¹⁴

Acute respiratory infections

Acute respiratory infections such as pneumonia are another primary cause of child deaths. Hand washing reduces the rate of respiratory infections in two ways:

- By removing respiratory pathogens found on hands and surfaces; and
- By removing other pathogens (in particular, enterovirus) found to cause diarrhea and respiratory symptoms.

Evidence suggests that better hygiene practices – washing hands with soap after defecation and before eating – could cut the infection rate by about 25%.¹⁵



¹¹ <http://www.cdc.gov/handwashing/>

¹² [http://www.thelancet.com/journals/laninf/article/PIIS1473-3099\(04\)01253-8/fulltext](http://www.thelancet.com/journals/laninf/article/PIIS1473-3099(04)01253-8/fulltext)

¹³ [http://www.thelancet.com/journals/laninf/article/PIIS1473-3099\(03\)00606-6/fulltext#](http://www.thelancet.com/journals/laninf/article/PIIS1473-3099(03)00606-6/fulltext#)

¹⁴ [http://www.thelancet.com/journals/laninf/article/PIIS1473-3099\(04\)01253-8/fulltext](http://www.thelancet.com/journals/laninf/article/PIIS1473-3099(04)01253-8/fulltext)

¹⁵ <http://globalhandwashing.org/why/health-impact>

II. Breakthrough Collaboration: Unilever and Dow Deliver a Game-Changing Solution

Unilever, one of the world’s leading consumer goods companies, has a mission to drive sustainable growth, which it has clearly articulated since 2010 through its Sustainable Living Plan. One of the goals within the plan is to help more than a billion of the world’s population improve their health and hygiene habits by 2020.

A prominent aspect of this goal is an effort to use Lifebuoy™ soap as the centerpiece for improving hand washing around the world, to reduce health related deaths and help more and more children reach the age of 5.

UNILEVER SUSTAINABLE LIVING PLAN SUMMARY



DRIVING SUSTAINABLE GROWTH

Launched in November 2010, the Unilever Sustainable Living Plan sets out to decouple our growth from our environmental impact while increasing our positive social impact. It is our blueprint for sustainable business.

Our Plan sets out three big goals. Underpinning these goals are nine commitments supported by targets spanning our social, environmental and economic performance. Our Plan is distinctive because it spans our entire portfolio of brands, all countries in which we sell our products and it applies across the whole value chain – from the sourcing of raw materials to our factories and the way consumers use our products. We have established objective measurement techniques, including appropriate estimates and assumptions, for each of our targets.



The challenge: In developing economies like India, many people can afford to spend only a small amount on luxury items such as soap. For the soap bar to be most effective, that soap bar must last as long as possible and also feel good to use, avoiding a sensation of dryness or irritation on the hands. If (1) children are taught at an early age to wash their hands at key times during the day and (2) parents feel they can afford a good-quality soap, then good habits are formed – and lives can be saved.

The opportunity: In its Sustainable Living Plan, Unilever set a goal to help more than a billion of the world’s population by

improving their health and hygiene habits by 2020. This goal creates many levels of opportunity for the Lifebuoy™ soap brand and positions Unilever to achieve its social, environmental and economic goals set in the Sustainable Living Plan. For this opportunity to become a reality, Unilever needs more than just contributors, but true partners who will actively collaborate to develop breakthrough solutions. Understanding this need, Unilever approached Dow in 2011 for help developing a new formulation for its Lifebuoy™ soap brand – one that would meet the needs of this critical audience, where the opportunity for impact in health and hygiene was highest.

Dow has a long history of working with major companies in the personal care and home care markets to develop innovative products that help solve some of the world’s challenges. With more than 50 years’ experience in developing cleaning solutions and a wide range of technologies from skin and hair care to laundry and surface cleaning, scientists from Dow Home, Institutional and Personal Care Solutions set about to collaborate with Unilever to provide a real-world solution to this challenge.

Combining the world-class polymer science capabilities and research and development expertise of Dow with the consumer understanding, marketing capabilities and worldwide reach of Unilever resulted in this breakthrough collaboration: a new, affordable, good-quality soap that could deliver a game-changing impact on health and hygiene around the world.

To reach the goal of increasing hand washing – and thus improving health and hygiene – among the audience most impacted by these sanitation challenges, Unilever and Dow needed to deliver a soap that not only met sanitation needs but also increased comfort – all while being affordable. This combination of benefits was a challenge, as traditionally incorporating these additional benefits in a formulation also increased cost.

However, Dow scientists were up for the challenge – aiming to deliver a soap this growing population could afford and would be much more likely to use. After a range of tests, Dow scientists delivered a new formulation constructed of non-ionic polymers with a high-molecular weight, delivering valuable technical characteristics, such as lubricity, binding, water retention, thickening and film formation.

The result was a new Lifebuoy™ soap formulation built on POLYOX™ Water-Soluble Polymers (Polyethylene Oxide) from Dow.

This powerful, new formulation resulted in an affordable, good-quality, high-performing bar of soap – one that would encourage adoption among this critical audience, directly enabling the path to improved health and hygiene, in direct support of Unilever’s goal.

The unique formulation of Lifebuoy™ soap, featuring POLYOX™ technology, delivered three key benefits:

- **Reduced formulation costs** – making the soap more affordable
- **Improved sensory feel of the soap** – making it feel better on the skin

- **Increased life of the soap bar** – making it last longer by decreasing the wear rate, providing many more washes per bar of soap.

“This bar of soap is actually a fairly sophisticated piece of technology. It must have just the right balance of cleaning and sensorial benefits. That is, to be most effective, the soap must deliver both the proper cleaning capabilities and leave just the right feel on the skin.”

– **Nilesh Shah**

Senior R&D Director, Dow Home, Institutional and Personal Care Solutions

More importantly, the new Lifebuoy™ soap bars help Unilever drive its Sustainable Living Plan goal to improve health and well-being by supporting its hand washing campaign for low-income families in emerging markets, and to help drive changes in hand washing behaviors – actions that help prevent the spread of illnesses and, most importantly, save lives.

According to Unilever, it was the breakthrough collaboration with Dow that not only delivered a unique formulation of soap, but that made this advancement in health and hygiene possible – enabling Unilever to achieve one of the key goals set forth in its Sustainable Living Plan. With this accessible, new formulation, Lifebuoy™ soap can now be a top contributor and necessary component to improving the health and hygiene habits for people throughout the world for decades to come.

Dow is proud of the breakthrough collaboration with Unilever in delivering against its goal of changing the hand washing behavior of one billion people in the developing world. Unilever acknowledged this contribution by honoring Dow with its “Partners to Win – Innovation” Award in 2013.

“Partners to Win – Innovation” Award

“This award is given to suppliers whose projects have resulted in astonishing results that have unquestionably impacted the market with innovations that have delivered better overall product functionality, speed to market and increased appeal to customers and consumers.”

“We are thrilled to award Dow Chemical the ‘Partner to Win Award for Winning Innovation’ for their commitment to working with Unilever to grow our businesses together sustainably.”

– **Pier Luigi Sigismondi**

Chief Supply Chain Officer, Unilever

III. Dow's Commitment to Sustainability

Energy and climate change, water, food, housing and health are areas of critical importance to humanity that also represent major world challenges. These challenges are therefore generating opportunities for innovation. Dow is committed to addressing these challenges, and this commitment is integral to the Company's corporate vision, mission and values. With more than 96% of manufactured products enabled by chemistry, companies like Dow – collaborating at the intersections of business, government and civil society – will ultimately solve these world challenges.

Dow combines the power of science and technology to deliver solutions for a more sustainable world. The Company's innovation engine is focused on development and commercialization of carbon mitigation, alternative energy, water purification, crop productivity, building efficiency and many more solutions that improve lives while protecting the planet. Yesterday, today, and into the future, Dow is driving change that is good for the environment, people and business.

IV. Dow's 2015 Sustainability Goals

Dow's approach to sustainability is to set clear and challenging goals, measure rigorously and regularly report on progress. This bold accountability inspires innovation in the Company and builds respect among stakeholders and collaborators.

the introduction of a more ambitious set of 10-year 2015 Sustainability Goals focused on strengthening community relationships, continuing to improve product stewardship, driving innovation to solve world challenges and reducing the Company's global footprint as well as that of its products.

In 1995, Dow set important goals to improve its environment, health and safety (EH&S) performance and was recognized for a variety of achievements, including waste, injury and cost reductions. In 2006, Dow set the bar even higher with

These 2015 Goals drive the way Dow approaches business and sustainability by identifying ambitious, measurable benchmarks:

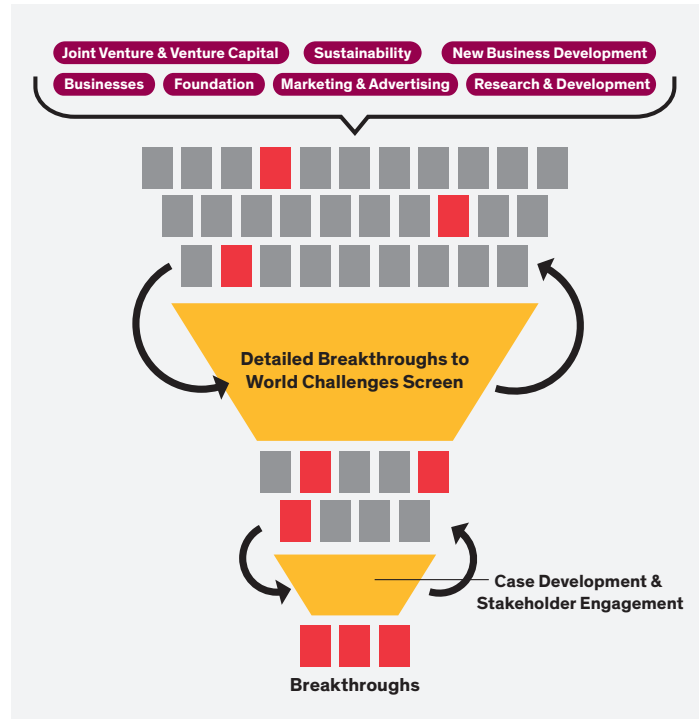
- **Breakthrough to World Challenges.** Dow is actively working toward – and committed to achieving – at least three breakthroughs by 2015 that will significantly help solve world challenges in the following areas:
 - Energy and Climate Change
 - Food
 - Health
 - Water
 - Housing
- **Sustainable Chemistry:** By 2015, Dow will increase the percentage of sales to 10% for products that are highly advantaged by sustainable chemistry.
- **Addressing Climate Change:** Dow will maintain absolute greenhouse gas emissions below 2006 levels
- **Energy Efficiency & Conservation:** Dow will reduce its energy intensity 25% by 2015.
- **Product Safety Leadership:** Dow will publish product safety assessments for all products by 2015.
- **Contributing to Community Success:** By 2015, 100% of Dow sites where the Company has a major presence will have achieved individual community acceptance ratings.
- **Local Protection of Human Health & the Environment:** By 2015, Dow will achieve on average a 75% improvement of key indicators for EH&S operating excellence from its 2005 baseline.

V. “Breakthrough to World Challenges” Goal

Dow is actively working towards and committed to achieving at least three breakthroughs by 2015 that make significant progress in the areas of energy and climate change solutions, sustainable water supplies, adequate food supply, decent and affordable housing, and personal health. A breakthrough is an innovation, whether in a technology or business model, that has the ability to scale to levels that will significantly impact the quality of lives around the world.

The “Breakthroughs to World Challenges” Goal (BTWC) identifies areas in which the company has unique competencies, and for which Dow employees have the passion and drive to make a contribution. The objectives of the BTWC Goal are simple: to address basic global needs and to create new sources of value for the company. Currently, Dow is sourcing innovation and breakthroughs by:

- Devising new technologies that improve products and services;
- Developing new business models and opportunities;
- Examining how to leverage existing technologies into new markets, emphasizing innovation; and
- Providing funding to start-up enterprises that bring needed solutions.



VI. Criteria for Determining Breakthroughs

A “Breakthrough to World Challenges” can take many forms. Given this variety, Dow established basic screens to evaluate innovations for their impact toward alleviating world challenges. This screen is made up of five key areas, each of which is considered when evaluating the impact of an innovation:

- **Alignment** – The innovation aligns with one or more of the five key categories of world challenges: energy and climate change, water, food, housing and health.
- **Significance** – The innovation makes a positive impact today or in the near future. Breakthroughs are intended to be implementable rather than theoretical, providing significant, measurable impact. The measure of significance can vary depending on the type of innovation and the challenge addressed, but in all cases it must positively impact millions of human lives.
- **Benefits** – The benefits of implementing the innovation significantly outweigh any potential challenges.
- **Life Cycle View** – Each stage of the solution’s “life cycle” – from development through manufacturing, distribution, use and end-life – is carefully vetted in regards to raw materials, energy use, water use, hazard profile, disposal and other social and environmental considerations.
- **Transparency** – The positives and negatives of the innovation are publicly disclosed and openly discussed with key stakeholders. Multiple aspects of the innovation are candidly and transparently evaluated.

VII. How the World Benefits from POLYOX™ Polymers

Truthfully, the world needs more solutions that help people live better lives. Taking the time to truly understand what Unilever, its customer, wanted to accomplish, Dow opened its science and technology portfolio wide open to develop a solution to meet that need and collaborated with Unilever to deliver a cost effective, right-sized solution in the form of a Lifebuoy™ soap. By leveraging the power of science and collaboration, Dow and Unilever delivered a bar of soap that allows more children – perhaps millions more – to live to see their fifth birthday.

Dow and Unilever are not alone in their efforts to improve hand-washing practices around the world. UNICEF, WHO, The Global Public-Private Partnership for Handwashing, and The Cleaning Institute – where Dow holds a Board position and which promotes “Global Handwashing Day” – all support this worthy cause.

For many years, Dow has offered POLYOX™ Water-Soluble Polymers for use in a variety of health- and hygiene-related applications, where they provide binding, thickening, lubricity, water retention and film formation benefits.



VIII. The Breakthrough Collaboration

Unilever and Dow have a long history of collaboration in developing innovations in personal care products in hair care and skin care applications that stretches back several decades.

Dow is proud of this breakthrough collaboration that was enabled by POLYOX™ technology and magnified by Unilever and its Lifebuoy™ goal of changing the hand washing behavior of one billion people in the developing world.



Lifebuoy started with William Lever's goal to stop cholera in 1880s in Victorian England. Over the past century, Unilever has evolved Lifebuoy into the beacon of hygiene by advocating the prevention of infections through the simple process of hand washing.¹⁶

In 2011, Unilever approached Dow to help find a cost-effective way to differentiate the performance of its Lifebuoy™ soap, particularly for the mini-bars (approx. 30–35 grams), which are sold in emerging markets like India at a cost of \$0.10 USD per bar.



Lifebuoy was originally marketed as a means to fight cholera in 1880s England.

At this price point, Lifebuoy™ soap essentially brings affordable hygiene to the lowest, most economically challenged strata of society, where

hygiene interventions also have the potential to show the most significant impact. The challenge was to engineer the soap in a way to enable it to deliver all the required hygiene benefits and delight the consumer with the product experience, while still making the bar economically viable to manufacture and distribute at this price point. The technology also had to be easy to process using Unilever's existing manufacturing processes and equipment, without additional hardware or capital investment, while simultaneously offering an affordable solution for the target group of low-income families. Dow came back with a solution centered on POLYOX™ Polymers, delivering all required consumer benefits: a longer lasting soap bar that also makes creamy, longer lasting foam and provides a differentiated feel on the skin.

¹⁶ Unilever information, provided through e-mail correspondence, July 2014.

¹⁷ Unilever information from Peter Gallagher, July 2014.

Several years before, the companies had collaborated to develop multiple soap bar prototypes at Unilever's Global Design Center for Soap Bars in Brazil. The goal at that time was to improve the luxurious feel of Unilever's Lux® beauty soap. They arrived at a precise soap bar composition that used POLYOX™ WSR N-60K Polymer as the critical ingredient. The bar delivered consumers a perceivable softness and sensorial smoothness, both during and after use. Unilever's assessment, which included consumer testing, indicated that it was a superior product versus the competition. The innovation led to a patent on the design and formulation of the bar.¹⁷



Lux® soap is an example of POLYOX™ Polymers used in a premium brand to impart a smooth, silky feel.

Unilever included the new formulation as part of a major global re-launch of the Lux® beauty bar in Brazil, Thailand and Indonesia. Consumers almost immediately reported clear benefits – “produces right amount of rich, creamy lather,” “does not leave a residue on the skin,” “leaves skin fresh and silky,” “thoroughly cleanses,” “improves skin condition,” and “makes skin look younger.”

Unilever's targeted market for Lifebuoy™ soap also wanted the smooth sensorial skin feel but valued other characteristics as well. The soap needed to have resistance to wear and “mush,” or bar softening after exposure to water. Precious bars of soap need to last long and stand up to repeated use if they were to achieve their full potential in improving hygiene.

“This enhanced value perception, especially with regard to wear, was critical for this target group of low-income families who are extremely value conscious. Dow's POLYOX™ was instrumental in helping Unilever break the value paradigm in the world of soaps by continuing to offer a soap bar at 10 US cents. The breakthrough value advantage and product performance, combined with Lifebuoy's proprietary germ protection technology, which promises '100% better germ protection as compared to ordinary soaps' became an unbeatable product proposition for consumers in this target group.”

– Peter Gallagher

Vice President Research & Development for Global Skin Cleansing, Unilever

Unilever soon introduced the new Lifebuoy™ soap formulation to the Indian market, in concert with a strong, successful push for its hand-washing campaign in Thesgora, India, and the launch of the award-winning film “Gondappa” in support of its “Help a Child Reach 5” campaign.

IX. Breakthrough Criteria of POLYOX™ Water-Soluble Polymers in Bar-Soap Applications

Alignment

The Dow-Unilever collaboration brings affordable, durable and safe soap to underserved markets – helping address the global challenge around health. Without this innovation and collaboration, the soap may not have had the desired appeal to and adoption among its target market, as it would have been more expensive and less desirable for multiple hand washings during a day, drying out skin.

Significance

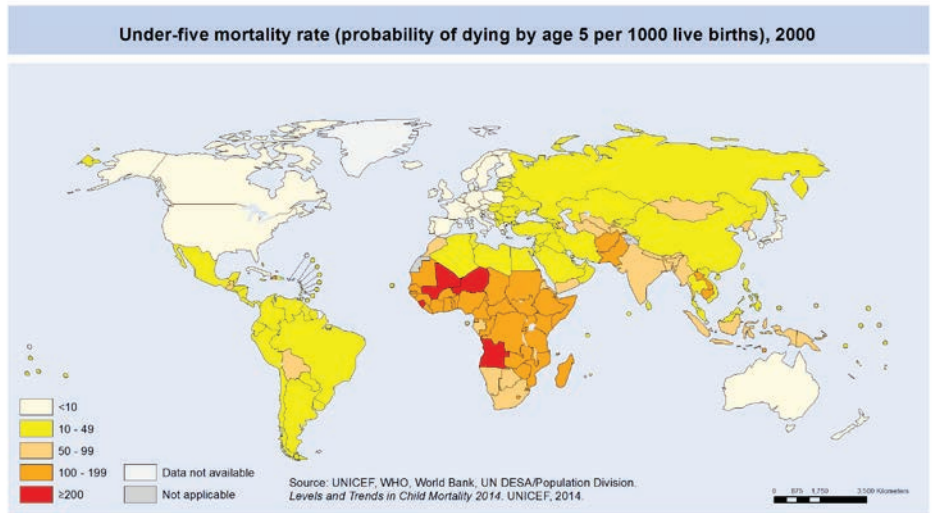
New product development is never easy but can be more difficult when trying to address markets that have a limited ability to pay for improved technologies. The triumph of improved Lifebuoy™ soap is that it is a product developed to be inexpensive while not feeling cheap. It is a cost-effective, right-sized solution that, along with Unilever’s hand-washing campaign – and, increasingly, efforts of other non-governmental (NGO) and for-profit organizations – is making a real difference around the world. The simple act of hand washing with an affordable, effective soap can reduce the incidence of preventable diseases by as much as 45–50%. This alone could halve the number of children under 5 who die of these diseases – from 2 million a year to 1 million.¹⁸

In hand washing, water alone is not enough – a fact again demonstrated most recently by a study in England. Washing with soap reduced the incidence of the presence of any type of fecal bacteria on people’s hands from 44% to 8%, whereas hand washing with only water reduced the incidence to only 23%.¹⁹

Efforts to improve hand washing since 2000 have already reduced the incidence of pneumonia and diarrhea in children under the age of 5, but there is more yet to be done.

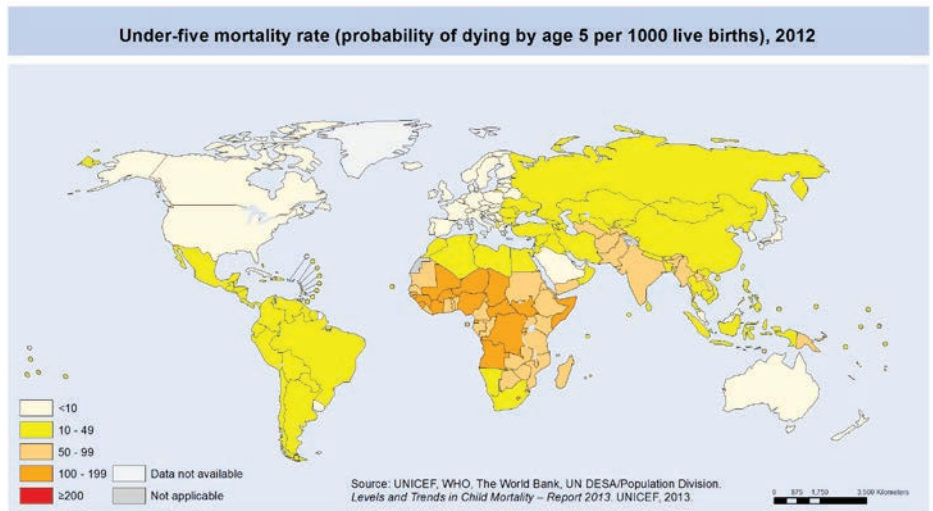
Benefits

As noted by the WHO charts, hand washing is an inexpensive and reliable way to save lives.



The boundaries and names shown and the designations used on this map do not imply the expression of any opinion whatsoever on the part of the World Health Organization concerning the legal status of any country, territory, city or area or of its authorities, or concerning the delimitation of its frontiers or boundaries. Dotted and dashed lines on maps represent approximate border lines for which there may not yet be full agreement.

Data Source: World Health Organization
Map Production: Health Statistics and Information Systems (HSI)
World Health Organization



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Data Source: World Health Organization
Map Production: Public Health Information and Geographic Information Systems (GIS)
World Health Organization



¹⁸ CHERG 2010. Sandy Cairncross, Caroline Hunt, Sophie Boisson, Kristof Bostoen, Val Curtis, Isaac CH Fung, and Wolf-Peter Schmidt. Water, sanitation and hygiene for the prevention of diarrhoea. Int. J. Epidemiol. 2010 39: i193-i205

¹⁹ Burton, Maxine, Emma Cobb, Peter Donachie, Gaby Judah, Val Curtis, and Wolf-Peter Schmidt. "The Effect of Handwashing with Water or Soap on Bacterial Contamination of Hands." International Journal of Environmental Research and Public Health 8 (January 6, 2011): 97-104.

A Special Note

APPROVED BY



ROYAL SOCIETY
FOR PUBLIC HEALTH

Lifebuoy™ soap was also recently accredited by Royal Society of Public Health (RSPH), for its hygiene credentials and Unilever's hygiene education efforts with respect to hand-washing with soap.

The RSPH is an independent charity with a long heritage of promoting public health by increasing knowledge and changing behavior and Lifebuoy™ is the first soap globally to be ever accredited by RSPH.

Among the various aspects that RSPH took into account while providing this accreditation were the efforts made by Lifebuoy™ to deliver hygiene to the people at the lowest income levels where it is needed most – for example, through the \$0.10 USD mini-bars that incorporate POLYOX™ technology.

Unilever and Dow hope to continue to leverage this collaboration to develop many more such consumer-focused innovations in the future.²⁰

Addendum

A Brief History of Soap

Soap was first discovered in 4,800 B.C. by Babylonians who reportedly used a mixture of fats and ashes primarily as a hair gel. However, by 3,500 B.C., the Ancient Egyptians were using soaps and aromatic oils not only for washing, but also as an important medication for many skin and muscle diseases.²¹ Roman folklore holds that women who lived near Mount Sapo discovered soap when rain washed a combination of wood ashes and animal fat into the clay soil by the Tiber River where they were doing laundry. The Roman historian Pliny disputed this claim and instead credited soap's invention to the Gallic and Germanic tribes the Romans encountered during their conquests. In any event, what is more definitively known is that Romans were using soap in their baths by 200 A.D.²²

The tradition of using soap was quite evident in Roman civilization. Several medicinal instruction books of the day noted that the use of soap was beneficial for health and long life. It was used for bathing, for laundry and to clean cookware and utensils. Sadly, after the fall of Roman civilization, personal hygiene habits the cleaning of living quarters, and washing before eating were essentially abandoned – with Asia a notable exception, where hygiene remained respected and enforced by tradition. The spread of many deadly diseases began across Europe and shortened the average human lifespan to only about 35 years.²³

Some populations did continue to bathe with soap even during the Middle Ages. For example, the Crusaders brought a Middle Eastern recipe for making Aleppo soap with olive oil back to Spain. As a result, Castile soap making flourished there during the 11th and 12th centuries. Soap made from

wood ash was produced in some of Marseille by mixing seawater, ash and olive oil.

Benefits of soap finally managed to appeal to wide European population in 17th century, and since then, the tradition of maintaining high personal hygiene has experienced constant growth. Advancements in technology and science enabled soaps to become more useful in cleaning and received many more medicinal uses as time went by.

With its beneficial medical use, ability to clean clothes and disinfect surroundings from harmful bacteria and dirt, soap remains one of the most useful and fundamental hygiene tools ever created by mankind.



²⁰ Unilever information from Peter Gallagher, July 2014.

²¹ www.soaphistory.net

²² "History of Soap," Vacca Foeda Media, www.todayifoundout.com

²³ www.soaphistory.net

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