



Request for Impact Research Proposals

D-Rev, a California-based nonprofit design company that develops products for low-income countries, seeks an academic partner to develop a research project focused on evaluating the impact of a market-based solution to an important global health issue.

D-Rev will work with the academic partner to develop an Expression of Interest that will be sent to the Weiss Family Program Fund by **November 23, 2014**.

Expression of Interest will need to include:

- Description of proposed project that would allow reviewers to determine its feasibility and potential impact on development policy
- Outline of a research hypothesis
- Identification strategy (for empirical proposals intended to estimate a causal effect)
- Project timeline, budget narrative, and detailed estimated budget
- Explanation of availability of data to be used in empirical proposals

Research project

Undertake a research study to determine the effectiveness of directly and indirectly reducing death and disability due to untreated or undertreated neonatal jaundice through market-based delivery of high-quality, low-cost phototherapy devices to hospitals in India.

Context

Despite the fact that death and disability due to Rh disease and extreme hyperbilirubinemia (EHB) (commonly known as neonatal jaundice) are preventable, the prevalence of death and disability due to these conditions is as much as 20 times higher in the developing world as it is in high-income countries.¹ Part of this is due to the lack of screening for Rh disease in many parts of the developing world. But a significant part, D-Rev believes, is due to a lack of availability of affordable phototherapy devices optimized for use in the developing world. D-Rev has developed a phototherapy device that is not only priced more cheaply than any other on the market, but one that utilizes the latest LED technology to provide treatment to AAP standards and frees users from ever having to change a bulb (the LEDs last beyond the life of the device). By introducing its Brilliance product to the market in India, D-Rev believes that hospitals that need devices to provide effective phototherapy will now be able to afford them, and will, in fact,

¹ Bhutani, Vinod K., et al. "Neonatal hyperbilirubinemia and Rhesus disease of the newborn: incidence and impairment estimates for 2010 at regional and global levels." *Pediatric research* 74.S1 (2013): 86-100.

buy them, and that this will result in babies being treated for jaundice at higher rates than otherwise would have been the case. As a result, we expect to see the rates of death and disabilities due to untreated or undertreated neonatal jaundice decrease across the population served.

Research questions

Both questions could be studied retrospectively or prospectively, since Brilliance has been on the market since 2012, but hasn't yet achieved full market penetration throughout India.

1. Does the introduction of D-Rev's Brilliance phototherapy device into a market result in higher rates of effective treatment for neonatal jaundice than would otherwise be the case?
2. Does the introduction of D-Rev's high-quality, low-cost Brilliance phototherapy device to the market result in changes in the medical device industry that have the indirect effect of lowering death and disability by increasing availability of affordable phototherapy devices across the board?



Current data available

D-Rev's partner, Phoenix Medical Systems Ltd., based in Chennai, India, manufactures Brilliance, and also manages all Brilliance sales and installations within India. Relevant study data available from Phoenix includes: hospital names and addresses, installation dates, type of hospital funding (private or public), and hospital location (urban or rural).

Each Brilliance unit is equipped with an LCD screen that provides basic usage data (hours that machine has been in use, etc.).

D-Rev has extensively researched use patterns around phototherapy devices, and an explanation of our current assumptions regarding use and impact can be found here: <http://d-rev.org/wordpress/wp-content/uploads/2014/10/Calculating-Brilliance-Impact-v2.pdf>.

Other resources available

D-Rev has close relationships with experts in the field of neonatal jaundice, and a genial and productive relationship with key personnel at Phoenix.

D-Rev has conducted extensive fieldwork in India, and would be able to send one staff person to assist in data collection for a period of no more than two weeks.

Possible approach to data collection and research

- Gather data about availability of effective phototherapy devices (sufficient # of devices, minimum levels of irradiance) across representative sampling of hospitals in India, including poverty levels of patients served. Then gather data (prior to and after the installation of Brilliance devices) about availability of effective phototherapy devices (sufficient # of devices, minimum levels of irradiance) across representative sampling of D-Rev partner Phoenix's Indian customer base, so we can understand better how representative Phoenix's customer base is of Indian hospitals generally.

About D-Rev

D-Rev is a 501(c)(3) nonprofit design company established in 2007, whose mission is to improve the health and incomes of people living on less than \$4 a day. We believe that everyone, no matter their origin or income, deserves the very best in design, and should be able to choose the products they use. We develop radically affordable, user- and context-appropriate products that meet international standards and/or exceed the quality of the best products on the market, and use a market-driven model for distribution, sales and scaling. Based in San Francisco, California, D-Rev is led by designer, engineer, and social entrepreneur Krista Donaldson, PhD.

About Brilliance

One of the key areas D-Rev is focused on is neonatal jaundice, which every year affects 3 out of 5 infants globally. D-Rev, along with experts at Stanford University, have estimated that of the 24 million babies who require treatment each year for neonatal jaundice, a full quarter of them (6 million) are not receiving adequate treatment.² To address this need, D-Rev developed Brilliance, an overhead phototherapy device targeted at district-level hospitals that retails at around \$400, less than a third of the cost of comparable devices. D-Rev has partnered with Phoenix Medical Systems Ltd. of Chennai, India, to commercialize Brilliance. Since the product's market launch in 2012, over 650 Brilliance units has been installed in hospitals in India and eight other low-income countries in Southeast Asia, sub-Saharan Africa and South America, treating more than 30,000 newborns with jaundice. More information about Brilliance and its impact can be found here: <http://d-rev.org/impact/brilliance/>.

Over the past year, Brilliance and D-Rev have been featured in the following publications:

² B. K. Cline, R. Vilms, K. McGraw, K. M. Donaldson, V. K. Bhutani. Global Burden and Unmet Need for Hyperbilirubinemia Treatment. Poster session presented at Pediatric Academic Societies Annual Meeting; 2010 May 1-4; Vancouver, British Columbia.

“7 Brilliant Designs That Save Lives” (WIRED, November 12, 2013)
<http://www.wired.com/2013/11/design-for-the-developing-world/#slideid-295671>

“Light Bulb Moments for a Nonprofit” (New York Times, January 11, 2014)
http://www.nytimes.com/2014/01/12/business/international/light-bulb-moments-for-a-nonprofit.html?_r=3

“Krista Donaldson: £250 device could save 1m babies from jaundice” (WIRED UK, May 2, 2014)
<http://www.wired.co.uk/news/archive/2014-04/29/wired-health-krista-donaldson>

Staff Bios

Sara Tollefson, Director of Impact

Sara Tollefson manages the collection, analysis and sharing of D-Rev’s impact data. As Director of Impact, she integrates D-Rev’s impact assessment requirements into product development strategy, and oversaw the design and launch of D-Rev’s Impact Dashboards. Sara holds a BA in Political Science from Stanford University and a JD from New York University School of Law. Prior to D-Rev, she practiced law in New York.

Krista Donaldson, CEO

Krista Donaldson, PhD, has driven innovation in product design, engineering, and international development for more than 15 years. As the CEO of D-Rev, Krista has led the design and scaling in emerging markets of Brilliance, radically affordable treatment for babies with jaundice, and the ReMotion prosthetic knee. Her leadership has won Krista acclaim as one of Fast Company’s 50 Designers Shaping the Future, a TED speaker, and a World Economic Forum Technology Pioneer. Prior to D-Rev, Krista was an economic officer at the US Department of State where she worked on economic policy and the reconstruction of Iraq’s electricity sector, and as a design engineer at KickStart in Nairobi, Kenya. She has also worked at the product design firm IDEO. Krista holds a BE in Mechanical Engineering from Vanderbilt University as well as a MSE (Product Design), MSME and a PhD from Stanford University in Mechanical Engineering design.

AJ Viola, Project Manager

AJ’s career path has taken him through both the private and nonprofit sectors. Before D-Rev he worked for McMaster-Carr, where he was most recently responsible for running warehouse operations and driving projects aimed at improving productivity and speed. Prior to this he worked for United Way Silicon Valley, helping assess business development strategies and performing quantitative analyses to maximize the effectiveness of fundraising resources. He has

also worked with entrepreneurs in India, bringing to market a high-quality wheelchair at an affordable price. AJ holds a B.A. in Psychology from Stanford University and an MBA from Harvard Business School.

Contact

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