

How much is a child's well-being worth?

More than 37 million children in North America live in an environment with unhealthy air and more than 15% have been found to suffer from reduced lung capacity due to air pollution. 90% of people living in urban areas are exposed to air quality levels that exceed WHO limits. It has been linked to chronic lung disease, heart disease, cancer and diabetes, the major killers in most countries. Young children (0 – 4 years old) are especially vulnerable because their lungs and immune system are still developing. They also breathe a greater volume of polluted air relative to their body mass and their exposure is often higher outdoors due to a high concentration of vehicle exhaust at their low elevation from the ground. Majority of low income families in large cities like Toronto live in areas with higher levels of air pollution and often cannot afford effective pollution reduction devices to protect the health of their families. When completing my PhD degree, I developed a new, portable device that can accurately measure air pollutants at a fraction of the cost of existing devices. While using the device to study air pollution in Toronto neighborhoods, many parents approached me for advice on ways they can use to protect the health of their kids. Some parents were concerned about the dust and idling pollution from construction in many local neighborhoods. Other parents had babies and toddlers who at such a young age already had respiratory conditions like asthma and could not spend time outdoors because the severity of their condition increased when they spent time outside. Many of the children had to use respirators and several different types of medications on a regular basis but the families did not have the means to move away from highly polluted city core.

I purchased commercial purifiers to test their effectiveness and found that they do not provide sufficient protection. I also found that many purifiers are not regulated and are too expensive for many parents. Many parents use methods that are not only ineffective but can even increase the risk for the child. Some parents were trying to protect the kids by keeping them indoors not realizing that air pollution indoors is often worse. Air pollution is also very variable across time and space but data on local pollution sources is still lacking. As a result, despite alarming evidence in the scientific literature, parents often don't realize the extent of risk their children face. I became very passionate and determined about this issue because I feel that given my findings, I have a duty to raise the awareness of this issue and offer a better solution to protect the health of children locally and around the world. These insights led me to develop Cleanopy Air4Kids technology.

I recruited a team and Cleanopy was started, dedicated to reducing the health risk factors of air pollution for children by providing affordable devices for monitoring and purifying the air. We developed several iterations of prototypes and secured the support of key partners. I lead technology validation through in-lab characterization and comparisons with commercial equipment. I built an excellent network of advisors and domain experts. During initial stages of Cleanopy technology development, we spent a lot of time researching and designing product features. We came up with a lot of features and thought that they would all be necessary to ensure viability. We were learning a lot but this process was taking up a lot of time and resources. About 6 months since we started technology development we came across Lean Startup Method, which inspired us to look beyond technology and start talking to parents to validate assumptions. When we started interviewing the parents, we realized that many of the features we spent a lot of time developing were not actually of interest. While it was hard to acknowledge the mistakes we made, the interviews with parents helped us re-focus the design and value proposition of the product. They helped us develop a solution that is not only more cost-effective but one that better addresses the needs of parents.