

# WHEELS OF CHANGE

## The Impact of Bicycles on Girls' Education and Empowerment in Rural Zambia

Randomized Controlled Trial by Innovations for Poverty Action (IPA) - Zambia | 2017 - 2018

Research Update | 2019 - 2020



**28%**

GIRLS' ABSENTEEISM WAS  
REDUCED BY 28%\*

RCT FINDINGS, 2017-2018



**66%**

PUNCTUALITY  
INCREASED BY 66%\*

RCT FINDINGS, 2017-2018



**19%**

GIRLS WITH BICYCLES WERE 19% LESS  
LIKELY TO DROP OUT OF SCHOOL\*

FOLLOW-UP STUDY, 2019-2020

*\*compared to girls in the control group*



After 10 years of successfully implementing its Bicycles for Educational Empowerment Program (BEEP), in partnership with the Ministry of General Education in Zambia, World Bicycle Relief (WBR) assessed the long-term impact of the program through a rigorous evaluation by independent researchers. In 2017, Innovations for Poverty Action (IPA), a research and policy nonprofit, conducted a randomized controlled trial (RCT) to assess the impact of WBR's bicycle programs on school-going adolescent girls' education and empowerment in rural Zambia. In 2019 and 2020, a follow-up study was conducted to evaluate the ongoing impact of the bicycles.



# THE NEED

Although great progress has been made toward improving equal opportunities and access to basic education in Zambia, girls' attendance rates are lower and dropout rates higher than that of boys<sup>[1]</sup>.

In poor households in Zambia and beyond, families sometimes cannot afford to support the education of all of their children. A long walk to school can make matters worse. A walk of a few miles each way can mean children are unavailable for household or farm chores. Such long commutes are also a safety risk, particularly for girls who may be forced to make part of their journey at dusk or dawn – putting them at risk for sexual predation and harassment. In the face of these challenges, some parents, fearful for their daughter's safety or their ability to make ends meet, may pull their daughters out of school. According to UNESCO, 85 percent of girls in low-income countries do not complete secondary school.

# THE OPPORTUNITY

The Zambian government has prioritized finding cost-effective and scalable strategies to close the gender gap in school attendance and learning outcomes. One strategy to improve school access and reduce travel distances is increasing school construction<sup>[2]</sup>. Although effective, this response is expensive and takes time. Alternatively, providing bicycles to girls helps them get to school quickly and easily, reserving their energy for school. Bicycles allow students to attend school more regularly and improve punctuality, both of which improve education outcomes.

Outside of school hours, bicycles can be used by the recipients and other family members for fetching water, bringing goods to market, accessing healthcare or other transport necessities.

*[1] From Grade 6 onwards, significantly more girls leave school than boys. In 2013 and 2014 more than double the number of girls in Grade 7 and three times as many girls in Grade 11 left school compared with their male peers (McConnell and Mupwalywa, 2015).  
[2] Duflo (2001), Burde and Linde (2013) and Kazianga et al. (2013).*



# THE SOLUTION

WBR's Bicycles for Educational Empowerment Program (BEEP) provides Buffalo Bicycles to students who walk more than 3km each way between home and school. BEEP aims to contribute to improving educational outcomes by making regular school attendance possible. To ensure the sustainability of the program, a community-led Bicycle Supervisory Committee (BSC) is established and trained to manage and monitor the progress of the program at each school. To help achieve gender equality, 70 percent of bicycles are allocated to girl students, and bicycle recipients are selected based on distance traveled and vulnerability criteria established by the BSC and the school. Each school chooses a bicycle mechanic who is trained to fix the bicycles, fit spare parts, and complete regular preventative maintenance.

Upon receiving their bicycles, students (together with their parents or guardians) sign a contract with the BSC, agreeing to attend classes regularly. The contract stipulates that if they adhere to the terms set out by the BSC, the bicycle becomes their personal property after achieving a specific learning milestone, such as graduation.



# THE STUDY

Phase one of the study took place from 2017 to 2018 in the Monze, Mazabuka, and Kalomo districts in the Southern Province of Zambia and was co-funded by UBS Optimus Foundation and WBR. IPA evaluated the impact of the Bicycles for Educational Empowerment Program in 55 new schools.

Researchers measured the effect the bicycles had on the time it took to reach school, absenteeism, punctuality, mobility, dropout rates, and grade transitions, as well as empowerment measures such as learners' locus of control, fertility choices, and aspirations.



Today, there are more than 130 million girls out of school. Research shows, there are few more powerful levers for reducing poverty than keeping girls in school. For each additional year of school girls complete, GDP increases 18 percent, according to UNICEF.

## THE IMPACT

Compared to the girls without bicycles, the girls with bicycles reported the following:

### TRAVEL TIME

- Bicycles reduced the girls' commute time by **one-third**, saving them more than **an hour each day**.

### PUNCTUALITY

- The bicycles increased punctuality by **66%**. The bicycles reduced the days that girls arrived late by **one and a half days per week**.

### ATTENDANCE

- The bicycles reduced absenteeism by **28%**. The girls with bicycles attended school approximately **five more days per year** than girls without bicycles.

### PERFORMANCE

- Girls with bicycles **scored higher** on a mathematics assessment test.

### EMPOWERMENT

- **Increased Locus of Control:** Girls with bicycles reported **feeling more in control** of the decisions affecting their lives than the girls in the comparison group.
- **Improved Self Image:** Girls with bicycles **ranked themselves higher** academically and had a greater belief in their potential to succeed in life.
- **Increased Pro-sociality:** Pro-sociality amongst the girls increased with the bicycle. This included their **willingness** to help a friend, their **participation** in local clubs and their **knowledge** of local leadership.
- **Bargaining:** Girls with bicycles **had access to** and **control over resources**, and had more open communication with their parents.
- **Income Generation:** Girls with bicycles were **less likely** to engage in income-generating activities.

### SAFETY

- Girls were **one-third** less likely to miss school or leave home early from schools due to concern for their safety.
- The bicycles reduced the probability of being harassed on the way to school by **22%**.

The 2017-2018 study (when the students were younger) did not find a statistically significant impact on dropout rates, grade transition, future aspirations, and mobility. The follow-up research in 2019 and 2020 did find such an impact, consistent with trends that show dropout rates increase as girls transition to secondary school. See the last page of this document for these additional data and findings.

The results demonstrate that bicycles can serve as a powerful conditional asset transfer that helps girls get to school, improves their attendance and test scores, and keeps them attending school – reducing their dropout rate compared to the girls who did not receive the bicycle.

The impact of WBR's low-cost programming extends beyond girls' improved educational outcomes. In the hands of a girl, our bicycle is a transformative asset that can change her standing in her home, her community, and her mind's eye.



# RESEARCH METHODOLOGY

A randomized control trial (RCT) study is regarded as the highest standard for research design. In a RCT participants are randomly assigned to a “treatment” group (which receives the intervention) or a “control” group (which does not receive the intervention). The effectiveness of the intervention is assessed by comparing data from the two groups after the program’s implementation.

For this RCT, the cohort consisted of 2,471 female students across 100 government primary schools (45 treatment schools and 55 control schools) in Southern Zambia. Randomization was at the school level.

- 1,112 girl students received Buffalo Bicycles (treatment group) and 1,359 girls did not receive bicycles (control group)
- Girls in the study were in grades 5, 6 and 7 when they received the bicycle
- The average age of participants was 13 years old
- Participants lived between 3km and 10km from school



## PRIMARY DATA COLLECTED BY RESEARCHERS

- Face-to-face survey through in-depth interviews with the girls
- Semi-self-administered survey on marriage and fertility desires
- Self-administered learning assessments in English and mathematics
- Non-survey measures of empowerment (limited schools)

## SECONDARY DATA COLLECTED BY RESEARCHERS

Administration data from the Ministry of Education included:

- Grade 7 exam results for 2017 and 2018
- Girls’ and boys’ attendance data from school registers
- Establishment data, such as enrollment, staffing, facilities and location

This data was then analyzed by the principal investigators commissioned by IPA: Nathan Fiala, PhD, (University of Connecticut, Makerere University and RWI-Leibniz Institute for Economic Research), Ana Garcia-Hernandez, PhD (Universidad del Rosario and IPA), Kritika Narula, PhD (Analysis Group) and Nishith Prakash, PhD, (University of Connecticut, IZA, CReAM, and HiCN).

**"From the time we received the bicycles, at school our performance has improved and actually it is improving every day...Since we now reach school early and start lessons with everyone, it has helped us improve in our English."**

— (GIRL STUDENT, MAZABUKA)

## ABOUT INNOVATIONS FOR POVERTY ACTION

IPA is a non-profit organization dedicated to discovering and promoting effective solutions to global poverty problems. In partnership with decision-makers, IPA designs and evaluates potential solutions to poverty problems using the rigorous method of randomized evaluations. IPA also mobilizes and supports these decision-makers – policymakers, practitioners, investors, and donors – to use the solutions to build better programs and policies at scale. For more information, visit <https://www.poverty-action.org/>.



## ABOUT WORLD BICYCLE RELIEF

World Bicycle Relief mobilizes people through The Power of Bicycles. It combines impactful nonprofit programs with social enterprise sales to meet the pressing need for reliable transportation in developing countries. Its philanthropic programs provide specially designed, locally assembled Buffalo Bicycles for students, health workers and entrepreneurs. Its social enterprise sales enable greater efficiencies of scale and distribution of bicycles per donor dollar and create a deeper impact in program regions. World Bicycle Relief is committed to helping people conquer the challenge of distance, achieve independence, and thrive. For more information, visit [worldbicyclerelief.org](http://worldbicyclerelief.org)

# WHEELS OF CHANGE: THE STORY CONTINUED

In 2019 and 2020, researchers followed up with our Wheels of Change students and evaluated attendance and dropout rates at the treatment and control schools.

Data from school administrative records shows that the bicycles continued to improve girls' attendance and reduce dropout rates, even when the Covid-19 pandemic created significant disruptions, requiring school administrators to close schools from April-September 2020.



## 2019 FINDINGS

### ABSENTEEISM

The bicycles reduced absenteeism by **41% on average**. The girls with bicycles attended **more than three extra days** of school per term than girls without bicycles.

### RETENTION

Girls with bicycles are **one-third** less likely to drop out of school than girls without bicycles.

## 2020 FINDINGS

### ABSENTEEISM

The bicycles reduced absenteeism by **29%**. The girls with bicycles attended **an extra two days** of school per term than girls without bicycles.

### RETENTION

Girls with bicycles were **19%** less likely to drop out of school than girls without bicycles.



### THE EFFECTS OF COVID-19

Between 2019 and 2020, data show a significant increase in the number of girls dropping out of school. Still, the dropout rate among girls with bicycles was significantly lower than that of girls without bicycles. It is unclear how much of this increase is due to Covid-19.



## FUTURE ANALYSIS

While current data continues to be analyzed, future research will provide deeper insights on the impact of bicycle programming on girl students. WBR is committed to understanding and expanding the impact of bicycle programming on the education and empowerment of rural girls around the world.

For more information you can email us at: [contact@worldbicyclerelief.org](mailto:contact@worldbicyclerelief.org)