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ACADEMIC OUTCOMES OF HOMESCHOOLED VERSUS CONVENTIONALLY SCHOOLED CHILDREN PURSUING THE ACCELERATED CHRISTIAN EDUCATION CURRICULUM IN KENYA

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Abstract

In recent times, the Kenyan education sector has experienced increased cases of students' indiscipline in schools. However, the potential of homeschooling as a possible solution to such indiscipline has not been explored. Whereas critics of homeschooling posit that homeschooled children are inferior academically, proponents of this form of learning don't think so. Therefore, this research compared the academic learning outcomes of homeschooled children and children in conventional school settings. The subjects in which scores were compared were math, English, and social studies. This research was anchored in the systems theory's input-output model developed by Ludwig Von Bertalanffy and adopted the causal-comparative research design. The target population was children pursuing the Accelerated Christian Education (ACE) curriculum. A sample of 316 children was drawn, out of whom 272 participated in the research. Data were analyzed using independent samples t-tests. Results revealed that homeschooled children achieved significantly higher math, English, and social studies scores than children in conventional schools. The research concluded that homeschooling as an alternative form of education enhances children's academic learning outcomes equally well and probably better than conventional schools. Therefore, the education sector in Kenya should consider legalizing homeschooling as an alternative form of education for some parents who want to detach their children from indiscipline cases that are majorly witnessed in conventional schools. Despite this research stating the case for legalizing Homeschooling in Kenya, a significant limitation was the reliance on the ACE curriculum and academic scores derived from one term's performance. Therefore, future studies should consider panel data that caters for comparisons across diverse curricula over time.

Keywords: *academic outcomes, homeschooling, conventional schooling, comparative research, ace curriculum*

Introduction

For educational success, Astin's theory of involvement identifies academic achievement as one of the critical indicators (Astin, 1984). While conventional schools have primarily been associated with improvement in academic performance, the home environment features significantly in studies probing antecedents of academic achievement (Anthonia, 2019; Jain & Mohta, 2019). Several covariates of academic performance, some of which strengthen the importance of the home environment, have been highlighted. Notable among these covariates are learning strategies (Veas et al., 2017), family participation in learning (Wilder, 2014), access

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to and utilization of technologies (Garcia-Martin & Canton-Mayo, 2019), and the learning environment (Santos et al., 2013).

Recent research into alternative forms of education, mostly undertaken in the western countries like the United States of America (USA) and Canada, has acknowledged the importance of the home environment and the role that parents play in children's learning through the homeschooling movement (Thomas, 2016; Ray, 2017). Homeschooling is perceived as a progressive movement through which parents take responsibility for their children's education at home instead of taking them to public or private schools (Carpenter & Gann, 2016). Several reasons have been advanced as to why families opt for homeschooling, including the fear that the conventional school structure does not guarantee children's progression, divergent educational experiences or religious philosophies, and dissatisfaction with educational options available (Ray, 2017).

While acknowledging homeschooling as an option for education in Kenya, the constitution does not explicitly address homeschooling in the law. This lack of recognition of homeschooling has been exacerbated by implementing of the Basic Education Act (No. 14 of 2013), which some school and government officials have used to criminalize Homeschooling (Tendu, 2020). And even then, institutions offering the homeschool curriculum in Kenya use British or American curricula, such as Kidato, which offers the British National Curriculum, Caplora based on the Cambridge British curriculum, and the Accelerated Christian Education (ACE), which uses the US curriculum.

Critics of Homeschooling have often blamed academic achievement by claiming that research on homeschooling is inconclusive regarding test scores or academic achievement (Johnson, 2005; Smith, 2010). However, more recent research indicates a positive effect of homeschooling on academic achievement (Lubienski et al., 2013; Ray, 2015; Ray, 2017). Besides, research has shown that most families who choose to homeschool do so because problems such as drugs and bullying, youth fights, and juvenile delinquency emerge in schools and are not adequately handled by teachers, some of whom are less professional (Cetin, 2015; Damayanti et al., 2020; Purwaningsih & Fauziah, 2019; Ray, 2016).

Recent events in the Kenyan education sector that have seen escalated arson cases in secondary schools have created a blame game among stakeholders. Some have apportioned blame to teachers for not being able to address indiscipline cases. Others have blamed the school calendar, drug abuse, curriculum overload, stress, and poor relations between students and teachers (Yusuf, 2021). The moral state of the country (Ngugi, 2021) and how protests and politics are handled (Cooper, 2014) have also come into the spotlight regarding arson cases in schools. Yet, the potential of homeschooling as a viable option for some parents who may not wish to expose their children to such arson cases remains unexplored.

Therefore, this research explored homeschooling as a viable alternative to conventional education in Kenya and the panacea to emerging challenges in the education sector by comparing academic outcomes of homeschooled and conventionally schooled children pursuing the Accelerated Christian Education (ACE) curriculum. Specifically, the research compared homeschooled and conventionally schooled children's Math, English, and Social Studies outcomes.

Literature Review and Hypotheses Development

This research was anchored on the input-output model embedded in the systems theory and developed by Ludwig Von Bertalanffy (Von Bertalanffy, 1967). According to this model, organizations transform inputs from the environment into outputs. Consequently, the choice of the input-output model for this study was based on the assumption that homeschooled children were inputs drawn from the home environment with parents creating the "Life as Education"

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(LaE) environment ideal for diverse learning experiences (Kunzman, 2013). Therefore, the presumption was that diverse learning experiences could transform children through academic outcomes.

Homeschooling

Homeschooling, also known as Elective Home Education (EHE) or home education, is a concept advanced by liberalists. These liberalists argued that the state needs to consider the differences in families' moral beliefs and values; and desist from offering a single mode of education (Oliviera & Barbosa, 2017). Consequently, homeschooling was perceived as a progressive movement that allowed some parents to educate children at home (Carpenter & Gann, 2016). The homeschooling movement was made famous by authors agitating for reforms in education to allow for alternative forms (Gaither, 2017). Liberalist theorists regarded homeschooling as a parental avenue to express liberty through the right to choose the ideal way to educate their children (Merry & Karsten, 2010).

In recent literature, many factors have been associated with the homeschooling evolution. They include safety standards in schools (Kunzman & Ganther, 2020; Neuman, 2019), declining academic standards due to unsuitable pedagogy (McCabe et al., 2021; Ray, 2015), integration of religious beliefs and values (Bartholet, 2020), family ethos (Belanova et al., 2016; Thomas, 2016), and social values (Mincu & Sarbu, 2018). Besides, comparative studies have demonstrated that homeschooling develops academic skills equally well (Ray, 2017) and that homeschooling hones moral values better than conventional schooling (Vaughn, 2015).

Homeschooling has gained acceptance in several nations such as the USA (Hirsh, 2019), the United Kingdom (Holloway et al., 2010), Australia (Conejeros-Solar & Smith, 2021), Canada (Brabant & Diamond, 2017), Norway (Washell, 2016), and New Zealand (Jackson, 2017). However, the concept has been slow in permeating African Countries. For instance, countries such as Uganda, Botswana, and Kenya are witnessing small numbers of parents pursuing homeschooling for their children (Olatunji, 2014). The argument posited by governments across these African nations is that progression in education is facilitated by the traditional schooling system (Moreau, 2012). Critics point to the lack of capacity for parents to master pedagogical skills required for the homeschooling curriculum (Nayir & Savi, 2021), social inequality propagated by the system (Merry & Karsten, 2010), and denial of children of opportunities to progress in adult life (Fineman & Shepherd, 2016). Therefore, to understand the significance of Homeschooling in Kenya, it was necessary to explore its impacts on academic excellence by comparing the academic outcomes of homeschooled and conventionally schooled children pursuing the ACE curriculum.

Homeschooling and Math Learning Outcomes

Mathematics education, especially in elementary school, is perceived as a foundation for later academic achievement and a flourishing adult job market (Kim et al., 2018). It is argued that despite mathematics being challenging, it is also fun and rewarding and offers a variety of opportunities, including logic, creativity, and employment (Masitoh & Fitriyan, 2018). Several skills are associated with mathematics excellence, including critical thinking, problem-solving, communication, quantitative reasoning, time management, analytical thinking, manipulation of precise and intricate ideas, logical arguments, independence, and teamwork (Azikovitsh & Cheng, 2015).

Parental involvement in their children's schooling has positively impacted their academic success (Wilder, 2013). It has been reported that the most positive benefits are associated with

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parents' development and maintained communication with children and their high expectations of children's achievement (Castro et al., 2015). Yet, research demonstrates mixed results when parents involve themselves in their mainstream schooled children's mathematics. For instance, Cai (2003) determined that supportive parents helped schoolchildren score higher in mathematics problem-solving tasks than non-supportive parents. On the contrary, parents who exhibited mathematics anxiety had little Impact on their children's scores (Maloney et al., 2015).

Moreover, mixed results have also been reported in mathematics outcomes among homeschooled children. Whereas Wilkens et al. (2015) found that students learning from home outscored their conventional school counterparts in college Calculus, Cooper (2005) and Qaqish (2007) demonstrated that homeschoolers scored below average in mathematics. Based on this background, the question was whether math outcomes compared equally among homeschooled and conventionally schooled children leading to the postulation that:

$H_0$1: There was no significant difference in math outcomes between homeschooled children pursuing the ACE curriculum and children in conventional ACE schools.

Homeschooling and English Learning Outcomes

Reading, writing, listening, and speaking are basic English language learning skills that require scaffolding (Wilson, 2016). Through these skills, children can develop communicative competence and think critically (Doulik et al., 2016; Pisova & Kostkova, 2011). According to Klimova (2014), language skills were either productive (writing and speaking) or receptive (reading and listening). Consequently, teachers need to employ exercises that promote these skills among pupils (Sebestova et al., 2011). Yet, Klimova (2014) recognized that identifying activities that integrate diverse language skills was difficult due to the differences in the communicative process required.

Research on homeschooling and the development of children's literacy skills remain inconclusive. For instance, some studies have reported a positive effect of homeschooling on letter-word, word attack, and comprehension (Martin-Chang et al., 2015), reading (Ray, 2010), and language and reading (Ray, 2015). Yet, other scholars reported a negative impact of homeschooling on literacy skills (Aram et al., 2016) and reading comprehension (Guterman & Neuman, 2019). With such contradictory results, the question was whether Homeschooling in Kenya would be comparable to conventional schools in developing English language skills. Therefore, the researcher postulated that:

$H_0$2: There is no significant difference in English language outcomes between homeschooled and traditional schooled children.

Homeschooling and Social Studies Learning Outcomes

The Social studies discipline is perceived as an educational programme that scientifically and psychologically organizes educational materials drawn from humanities and social science for educational purposes (Soemantri, 2001). According to Nurcahyo and Hartono (2011), social studies is one of the subjects in primary education that prepares pupils to cope with the changing global society. Social Studies as a subject subsumes knowledge, skills, attitudes, and values (Permatasari, 2019). Under the knowledge domain, Permatasari (2019) has identified disciplines such as history, geography, anthropology, politics, economy, and socio-psychology as disciplines that enable pupils to understand themselves and their environment. Meanwhile, attitudes focus on social and intellectual behavior.

Although social studies are recognized as a critical subject in elementary education, it features minimally in homeschooling research at the expense of social studies outcomes. For

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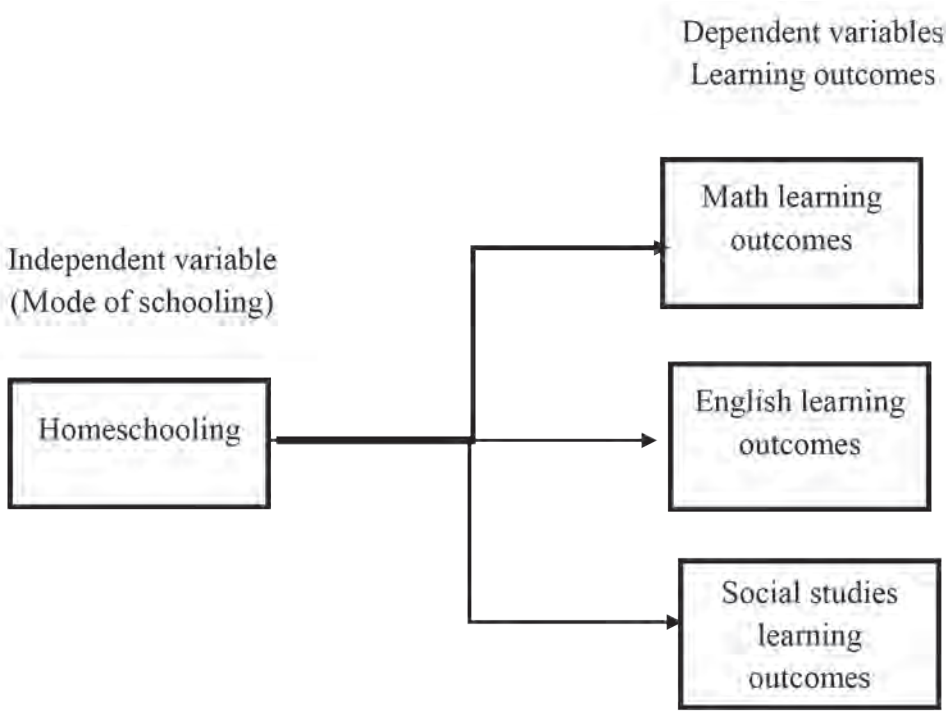
instance, Ray (2010) focused on science instead of social studies when examining the effect of homeschooling on academic learning outcomes. This scarcity of studies on social studies learning outcomes led to questions about whether Homeschooling in Kenya elicited learning outcomes in social studies compared to conventional schooling. Therefore, the researcher presupposed that:

$H_0$3: There is no significant difference in social studies learning outcomes between homeschooled and traditionally schooled children.

Based on the postulations made, the research adopted the conceptual framework in Fig.1 that conceptualized the direct effects of homeschooling on the various academic learning outcomes.

Figure 1
Conceptual Framework



Research Methodology

Study Design

This research adopted the causal-comparative research design to compare and contrast groups (Bloemraad, 2013; Esser & Vliegenthart, 2017). Consequently, this design compared academic learning outcomes between children pursuing the ACE curriculum from home with children in conventional ACE schools. Through this comparison, the research expected results that would increase an understanding of the impact of homeschooling on children learning and create a foundation for investing in homeschooling to address emerging issues in the education sector in Kenya.

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Study Sample

The study targeted children pursuing homeschooling under the ACE program in Kenya who, as of March 15, 2016, were 1788. The study utilized a sample of 316 children as determined from the Krejcie and Morgan sample size table. The pooled sample comprised 158 homeschooled and 158 children from conventional schools computed using a formula suggested by Dattalo (2018) to cater to comparative research designs when the sample standard deviation is unknown. That is . Where n was the required sample size for each group, z was the confidence interval, which was a 95% confidence level in this study. E was the desired margin of error, set at 5% for this study, represented the pooled estimate of the variance of the dependent variable in each comparison group. Sampling was done through stratification by grade and a simple random sample for respective numbers per grade.

Data Collection

A document analysis checklist was developed and used to collect children's performance scores in math, English, and social studies. Performance data for conventionally schooled and homeschooled children were collected from records kept at the ACE center. Therefore, two sets of academic scores in the three disciplines representing conventional and homeschoolers were prepared, consistent with the required sample sizes.

Data Analysis

The independent sample t-tests compared the mean scores in Math, English, and Social studies between children in conventional schools and homeschooled children to determine if the scores differed significantly. Under this approach, the assumption was that there were no significant differences in the mean scores of Math, English, and Social studies between the two groups.

Research Results

Descriptive Results

After data screening and cleaning, 272 scores were analyzed. Table 1 gives the summary statistics of the children's learning outcomes in the three subjects. On average children pursuing the ACE curriculum scored highly in math (M = 93.55%, SD = 5.29%), English (M = 93.01%, SD = 5.45%), and Social studies (M = 93.32%, SD = 5.40%). The minimum score posted in the three subjects was 80%, while the maximum score was 100%. The small standard deviation scores depicted consistency in the high achievement across children pursuing the ACE curriculum

Table 1
Learning Outcomes for Children Pursuing ACE Curriculum

Subject	Minimum	Maximum	*M*	*SD*
Math	80	100	93.55	5.29
English	80	100	93.01	5.45
Social studies	80	100	93.32	5.40

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Comparing Math Learning Outcomes

Table 2 reports the mean math scores across the two groups, the mean differences in scores, and the significance levels. Ignoring children's background characteristics, children in home schools reported higher math outcomes (M = 96.34, SD = 3.585) than children in conventional schools (M = 92.63, SD = 5.443). Equal variances assumed, homeschooled children demonstrated significantly better math scores, t (270) = 5.26, p < .001.

Table 2
Math Learning Outcomes

Category of school	*M*	*SD*	*SEM*	
Home	96.34	3.59	.44	
Conventional	92.63	5.44	.38	
t-test for Equality of Means				
t	*df*	Sig.(2-tailed)	*MD*	*SE*
5.26	270	*p* <.001	3.71	.71

These results imply that homeschooling was an equally effective form of education that imparted high math skills to children. Through this form of learning, homeschoolers elicited higher math learning outcomes that reflected efforts by parents to be supportive or bring onboard supportive caregivers.

Comparing English Learning Outcomes

Table 3 reports the differences in mean English scores between homeschooled and children in ACE conventional schools. Ignoring background characteristics, children in home schools reported marginally higher scores in English (M = 95.29, SD = 4.40) than children in conventional schools *(*M = 92.25, SD = 5.563). Equal variances assumed, homeschooled children again demonstrated significantly better English scores, t (270) = 4.107, p < .001.

Table 3
English Learning Outcomes

Category of school	*M*	*SD*	*SEM*	
Home	95.29	4.40	.53	
Conventional	92.25	5.56	.39	
t-test for Equality of Means				
t	*df*	Sig.(2-tailed)	*MD*	*SE*
4.107	270	*p*<.001	3.05	.74

These results imply that children pursuing the ACE curriculum schooling from home scored higher in English than those from conventional schools. These results add to the existing discourse on homeschooling by confirming that it possesses the capacity to be a viable alternative form of education. The higher scores reported by homeschoolers in English may

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be due to access to technology which enabled them to gain exposure to an array of English language opportunities.

Comparing Social Studies Learning Outcomes

Table 4 reports the estimated differences in social studies learning outcomes between homeschooled and conventionally schooled children pursuing the ACE curriculum in Kenya. Ignoring children's background characteristics, homeschooled children reported higher mean scores in Social studies (M = 95.82, SD = 4.17) than conventionally schooled children (M = 92.48, SD = 5.51). The mean difference in social studies scores was statistically significantly different, t (270) = 4.58, $p < .001$.

Table 4
Social Studies Outcomes

Category of school	*M*	*SD*	*SEM*	
Home	95.82	4.171	.506	
Conventional	92.48	5.513	.386	
t-test for Equality of Means				
.t	*df*	Sig. (2-tailed)	*MD*	*SE*
4.58	270	*p*<.001	3.342	.730

The reported results confirm that homeschooled children's social studies achievements were not significantly different from children in conventional schools and were probably better. The study finds that social studies skills for homeschooled children were consistently better than those for conventional schools. These findings demystify the claim that homeschooling as a concept is bad for the collective good. The results demonstrate that homeschooled children can achieve high outcomes in social studies, perhaps due to leveraging virtual and interactive technology accessible to them.

Discussion

Through the descriptive and inferential results, this research confirmed the capability of homeschooling to foster academic learning outcomes. The analysis revealed that children pursuing the ACE curriculum by schooling from home achieved marginally higher Math, English, and Social studies outcomes than children in conventional ACE schools. The research corroborated previous findings showing similar findings (Purwaningsih & Fauziah, 2019; Brewer, 2021; Ray, 2021). The result that homeschoolers achieved higher in math than children in conventional schools underscored parents' vital role in helping children make sense of the world while taking cognizance of moral and religious values. Research demonstrates that parents' control for demographics and homeschooling considerably vary in the way they implement math activities (Elliott et al., 2020). This ability to control demographics is perhaps the main benefit that accrues from homeschooling, given that providing for individual differences has remained a concern in today's inclusive conventional classrooms (Dubois & Adolphs, 2016). Therefore, parents are in a vantage position to promote a good beginning in math in early childhood by leveraging interactive digital technology that exposes children to many mathematical games. These arguments explain how homeschooled children could report higher learning outcomes than children in conventional ACE schools.

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In finding that homeschoolers reported higher learning outcomes in English than children in conventional schools, this research signified the importance of the home learning environment in the systems theory's input-output model. Such an environment allows the inputs, which are children, to play and interact with books, objects, and role models for enhanced English learning outcomes seen as outputs. This finding echoed a previous conclusion that the home literacy environment was differentially associated with letter knowledge, English vocabulary, reading skills, and phonological awareness (Lau & Richards, 2021). Consequently, exposing children to homeschooling allows them to experience such differentiation in English language learning. Besides, research has shown that the home environment, especially in low-income families, supports language development and paves the way for future academic achievement (Tamis-LeMonda & Rodriguez, 2008).

Meanwhile, the finding that homeschoolers also reported higher learning outcomes in social studies than children in conventional schools justifies emerging digital technologies that have interconnected today's world, making it easier to access information. Such interconnection allows homeschoolers to interact with people of diverse cultures and communities. Besides, given that social studies focus on social relationships and societal functioning, it is inevitable that homeschoolers who interact more with parents and other members of society have a better understanding of their society and the world. Such closer interaction explains why homeschoolers would achieve higher in social studies than children in conventional schools.

This research is significant in several ways. Besides contributing to the emerging interest in homeschooling and its impacts and motivations at the individual and society levels, it highlights the contributions of digital technology to the successful implementation of homeschooling. By leaning towards the ACE curriculum, this research demonstrates that in addition to developing academic and social outcomes, homeschooling is also the hope of parents to develop moral and religious values while at the same time offering a comfortable atmosphere for children to maximize learning experiences. The study further suggests that homeschooling holds the promise to stop the increasing cost of education that accounts for more children from low-income families dropping out of school. Therefore, the focus should be on popularizing homeschooling in developing countries to attain the global goal of "Education for All" (EFA).

Although this research builds the case for legalizing Homeschooling in Kenya, it relies only on the ACE curriculum in comparing the two sets of children. Besides, the study used academic scores recorded for only one term. This research, therefore, failed to control variability in time frames, age, and grade adequately. Future studies should consider cross-sectional data that caters to time and across grade variability. Further future studies should consider running robust tests to control other potential covariates. Structures should also be put in place to reduce the cost of technology to enhance access to homeschooling among low-income families.

Conclusions and Implications

The following conclusions were drawn from this research's descriptive and inferential findings and the discussions afterward. This research confirmed that homeschooling is a viable alternative form of education that enhances children's academic learning outcomes. Homeschooled children pursuing the ACE curriculum achieved at the same level or even better than children in conventional ACE schools, making a solid case for homeschooling in Kenya. Homeschooling exposes children to varied learning experiences through interactive games for Math and virtual tours globally. These games and tours boost homeschoolers' achievement in Math and Social studies. However, the need for digital media makes this form of education more expensive. Homeschooling provides an ideal environment for children to improve their English learning outcomes by enhancing interaction with parents, siblings, and other members of society.

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The finding that homeschooling produces children with academic outcomes comparable to children in conventional schools has many implications for the education sector in Kenya. Challenges such as learner indiscipline that the sector experiences can be addressed by making provisions for homeschooling. Such provisions would see parents take a prominent role in controlling their children's upbringing and education. The research showed that homeschoolers rely mainly on technology to source information and make virtual tours. It is incumbent upon educational stakeholders to maximize the potential inherent in technology to provide enriched learning environments in conventional schools. In advocating for homeschooling as a viable solution to the challenges experienced in Kenya's education sector today, this research argues that the government of Kenya should target policies that support homeschooling among families with the children's learning and upbringing solely under parents' control.

Declaration of Interest

Authors declare no competing interest.

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