Vaccination Risk Through the Lens of Faith, Family, and Community

Rachel E. Stein
Professor of Sociology
West Virginia University
rachel.stein@mail.wvu.edu

Katie E. Corcoran
Professor of Sociology
West Virginia University
kecorcoran@mail.wvu.edu

Corey Colyer
Associate Professor of Sociology
West Virginia University
corey.colyer@mail.wvu.edu

Abstract: Reasons for vaccine hesitancy, refusal, and acceptance within the Amish and Old Order Mennonite populations reflect the views of the larger society, often citing risks or protective factors as motivating behavior. We use the open-ended comments from a survey of Amish and Old Order Mennonite parents in the Holmes County, Ohio, settlement to explore views on vaccination decisions. We find the Amish and Mennonite respondents talk about vaccine risks and benefits through a moral worldview lens of faith, family, and community. We note the values of the Amish and Old Order Mennonites do not motivate behavior uniformly across all respondents. The findings have important implications for how health care workers provide information and care to people in the Amish community.

Submitted February 20, 2025; accepted May 13, 2025; published July 15, 2025
https://doi.org/10.18061/jpac.v5i2.10526

Keywords: vaccine, immunization, Amish, vaccine hesitancy

The introduction of vaccines into society did not create automatic compliance. While widespread vaccine uptake could reduce the incidence of disease and limit outbreaks, many people remained skeptical or did not seek out the preventive procedure. As vaccines advanced and became available for routine childhood illnesses, the distrust of medicine grew. The government developed initiatives to require childhood vaccinations, which, in turn, created resistance to government interference in personal health decisions (Conis, 2015; Reich, 2020). Many state governments responded to the lack of preventive action with compulsory immunization laws for public schools. The laws were effective in vaccinating school-aged children, and many parents generally followed the guidance of their physicians to vaccinate their children (Orenstein & Hinman, 1999).

Most people in the U.S. are not opposed to the compulsory immunization laws. Many parents trust vaccines to protect their children from disease (Bults et al., 2011; Gellin et al., 2000; Keane et al., 2005; Orenstein & Hinman, 1999; Tickner et al., 2007). Moreover, some parents view vaccination as their social responsibility. They articulate a duty to protect all children, their own and others, through vaccination practices (Tickner et al., 2007).

Despite the evidence of the safety and effectiveness of vaccines, however, some people distrust mainstream medicine and avoid vaccinating their children. While this distrust has existed since the introduction of the smallpox vaccine in the early 1800s (Reich, 2020; Wolfe & Sharp, 2002), vaccine hesitancy has become more prominent in recent decades. The widespread use of vaccines has lowered the incidence of vaccine-preventable diseases. This perception of low disease susceptibility, when coupled with concerns about vaccine safety, leads to vaccine hesitancy or refusal (Bedford & Elliman, 2000; Dubé et al., 2013; Gellin et al., 2000; Nicoll et al., 1989; Smith, 2004). Hesitancy indicates people delay vaccinations; while they are not wholly opposed to vaccines, they are not likely to follow the vaccination schedule and may not receive all recommended vaccines.

Vaccine-hesitant parents express several concerns about immunizing their children. Commonly expressed reservations include questions about the ingredients and production of vaccines. Combined vaccines such as the MMR (measles, mumps, and rubella) vaccine raise additional concerns, including worries about overmedicating (Hilton et al., 2006; Hussain et al., 2018; Smailbegovic et al., 2003; Tickner et al., 2007; Walsh et al., 2015; Whyte et al., 2011; Williams, 2014). Parents fear vaccinations may cause harm and serious side effects in their children and indicate too many immunizations might harm children's immune systems (Gellin et al., 2000; Meszaros et al., 1996; Salmon et al., 2005; Whyte et al., 2011; Williams, 2014).

Many people fear that administering vaccines to healthy children will harm them. For instance, in the late 1990s, a claim asserting that MMR vaccines caused autism circulated broadly. Though subsequent research discredited that claim, some parents remain convinced that vaccines cause autism (Hussain et al., 2018; Whyte et al., 2011; Williams, 2014).

Selective vaccination practices demonstrate that parents avoid vaccines for low-risk diseases (Ball et al., 1998; Bults et al., 2011; Salmon et al., 2005). Indeed, in cases where the disease risks are considered low, parents indicate they would rather their child acquire immunity through infection (Salmon et al., 2005; Williams, 2014). For example, research suggests vaccine uptake is lowest for the varicella vaccine (Begg & Nicoll, 1994; Orenstein & Hinman, 1999; Salmon et al., 2005; Taylor & Newman, 2000). The varicella vaccine is a relatively recent addition to the childhood vaccine schedule. Many parents have experienced chicken pox and do not consider the disease serious. Additionally, some parents object to certain immunizations on moral or religious grounds, such as those perceived to contain fetal tissues in their production or those linked to the prevention of sexually transmitted diseases or infections (Katz et al., 2009; Pelcic et al., 2016; Shelton et al., 2013; Wombwell et al., 2015; Wong et al., 2020).

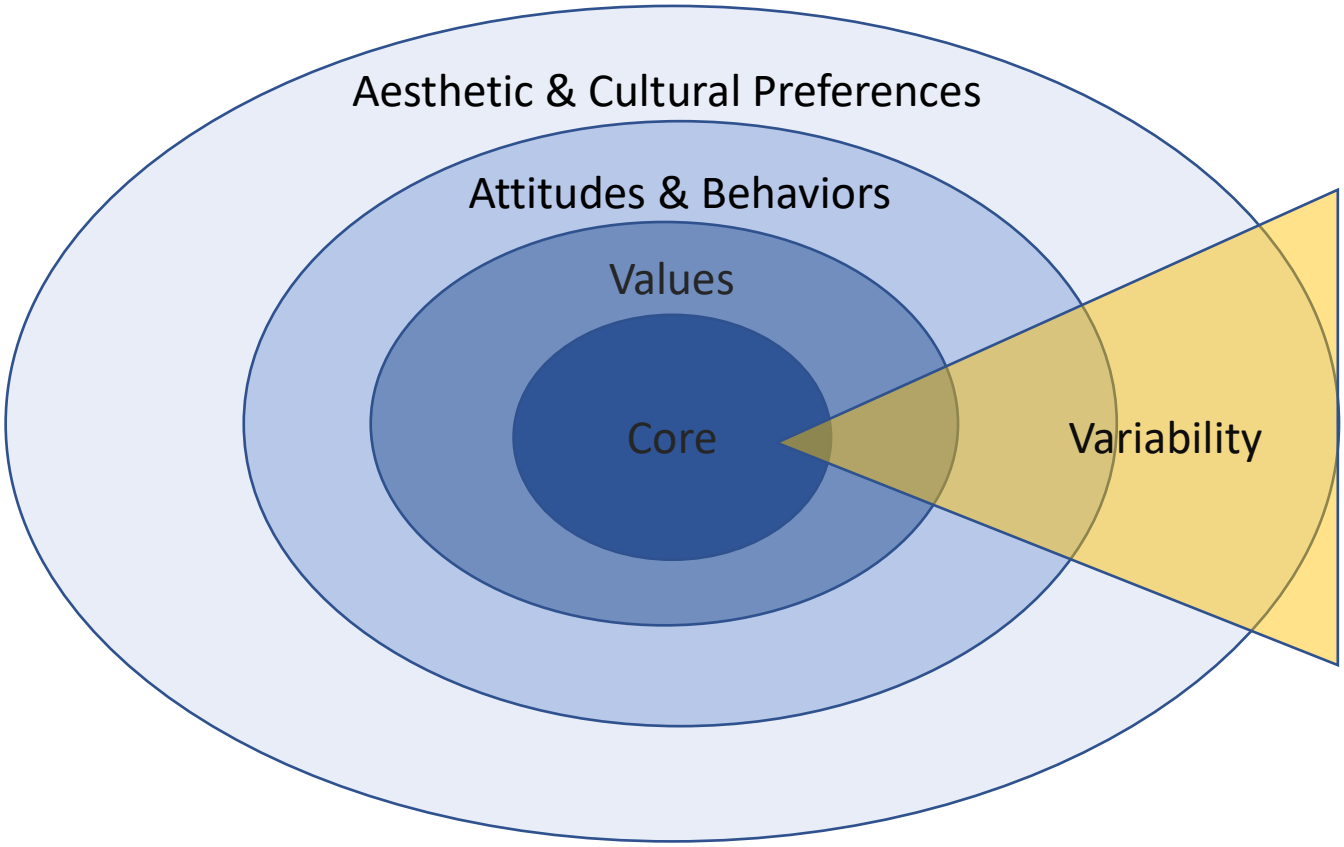
Complicated motives drive human behavior. While religious beliefs or values anchor some objections to vaccination, they mingle with other factors. Most people draw upon moral

worldviews to orient behavior. Worldviews are socially constructed frameworks for understanding one's experience in the world. Moral worldviews define values, interests, and symbolic boundaries (Corcoran, Stein, et al., 2021; Wellman, 2008; Wellman & Keyes, 2007). Religion contributes to different moral worldview constructions.

Wellman's (2008) theory of moral worldviews proposes four interconnected layers centered on a moral core comprised of nonnegotiable beliefs held by those who share the worldview. Those beliefs mold a person's values, representing the second layer of the worldview. This layer is still relatively consistent across those holding the worldview. There is more variation in the next layer, wherein values translate into attitudes and behaviors, including economic, political, and health. Suppose no predefined connections exist between values, attitudes, and behaviors within the moral core. In that case, individuals must make the connections leading to variation across those sharing the worldview. The last layer contains aesthetic and cultural preferences and tastes not defined by the preceding layers, such as taste in food or music. This final layer has the most variation as its form is the least prescribed by the moral core and its resulting values. (See Figure 1.)

Figure 1

The Interconnected Layers of Wellman's Moral Worldviews



While people may not explicitly cite religious reasons for vaccine hesitancy or refusal, moral worldviews grounded in religious beliefs often guide their decision-making. Deeply held values affect people's perception of risks associated with vaccines, which in turn shape decisions (Ganga Kieffer, 2023). Vaccination decisions can reflect religious worldviews. The worldview perspective allows researchers to identify implicit religious values from statements in a way that direct questions about religious ideals can't capture.

In the United States, religious conservatism correlates with higher rates of vaccine hesitancy and lower rates of vaccine uptake (Brewer et al., 2011; Constantine & Jerman, 2007; Corcoran, Scheitle, et al., 2021; DiGregorio et al., 2022; Galbraith et al., 2016; Katz et al., 2009; Whitehead & Perry, 2020). Yet, religious conservatives, even those within the same tradition who share a moral worldview, vary considerably in their orientation to vaccines. Perhaps vaccination fails to intrinsically connect to the moral core of these religiously conservative moral worldviews. If so, religious conservatives must make their connections independently.

The Amish and Old Order Mennonites in the United States are under-immunized compared to the recommended immunization schedule (Boyce, 2007; Grabenstein, 2013; Kettunen et al., 2017; Wenger et al., 2011; Williamson et al., 2017) though immunization rates vary across and within settlements (Kettunen et al., 2017; Scott et al., 2021; Stein et al., 2022; Wenger et al., 2011). No explicit laws or rules within the Amish and Old Order Mennonite traditions unequivocally prohibit vaccination. As such, the Amish and Old Order Mennonites must reflect on and decide how their moral core and values translate into vaccination attitudes and behaviors for themselves and their families. While there have been several prior quantitative studies on Amish and Old Order Mennonite vaccination attitudes and behaviors (Scott et al., 2021; Stein et al., 2022; Wenger et al., 2011), there have been considerably fewer qualitative studies, which are more conducive to examining how moral cores and values shape vaccination attitudes and behaviors. We explore the written comments on a vaccine survey to investigate the concept of worldviews, assessing how respondents talk about the risks and benefits of vaccination in Amish and Old Order Mennonite communities. We find the qualitative responses reveal vaccine hesitancy, refusal, and acceptance through the lens of faith, family, and community (Yoder, 2022, 2023).

Amish and Old Order Mennonite Worldviews

The Amish and Old Order Mennonites are part of the Anabaptist tradition that started in sixteenth-century Europe. The Anabaptists broke away from other branches of the Protestant Reformation, insisting that only adults could consciously choose baptism and join the church. This is highlighted as an important decision, as the person puts aside individualism for the good of the group. Anabaptists believe this should be a conscious decision and that people should willingly acknowledge that they put the group or the community before their own needs (Kraybill & Hurd, 2006). Hostetler (1987) and Zimmerman Umble (1996) indicate that North American Amish and Mennonite settlers abided by the Schleitheim Articles, an early Swiss Anabaptist confession of faith that anchored daily life on biblical Scripture. Anabaptists embraced the ideals of *Gelassenheit*, which translates roughly to the submission to a higher authority. God is the ultimate

higher authority, but Anabaptists also encourage submission to the church, elders, parents, the community, and tradition.

While schisms continued to divide the Anabaptist groups into subgroups of Amish and Mennonites, Hostetler (1987) purports the centrality of the Schleitheim Articles as the values that provide the foundation of Amish and Mennonite life. These values emphasize the centrality of community connections and tradition. Churches encapsulate their values in an *Ordnung*, which Nolt and Meyers (2007) describe as "the accumulated traditional wisdom about the proper ordering of life." (p. 8). Kraybill and Hurd (2006) describe the Ordnung as a *cultural fence* separating the Anabaptist groups from mainstream society. The church regulations provide members with a collective moral order by which they live their daily lives and provide guidelines for behavior to promote group cohesion (Kraybill & Hurd, 2006; Nolt & Meyers, 2007).

Families constitute the core of church groups, providing essential kinship ties that bind the community together. Extended family ties provide meaningful network connections within a church, across churches, and settlements. Moreover, parents take seriously the responsibility of raising their children to remain faithful to the Ordnung, thereby strengthening and building the community (Wenger & Wenger, 1988).

Vaccination Attitudes and Uptake Among the Amish and Old Order Mennonites

The importance of Gelassenheit, humility, and living the Scripture provides the moral core of the Amish and Old Order Mennonites; however, there are generally no specific prescriptions for vaccinations. Grabenstein (2013) reports that many Amish communities reject immunization based on social traditions rather than religious doctrine, and these practices vary across church districts. Gastañaduy et al. (2016) agree, noting that the Amish church does not prohibit vaccinations, but personal and cultural beliefs limit preventive health care. As such, Amish vaccination rates vary, though they are generally lower than the rates in the general U.S. population (Boyce, 2007; Grabenstein, 2013; Kettunen et al., 2017; Wenger et al., 2011; Williamson et al., 2017). In terms of following the full vaccination schedule, one study found that 18% of the study's Amish and Old Order Mennonite respondents fully vaccinated their children according to the recommended schedule (Scott et al., 2021). In contrast, another study found that 58% of Amish parents identified that their children received all immunizations according to the schedule (Kettunen et al., 2017).

As in mainstream society, fears of adverse effects are also evident among the Amish population. Indeed, the Amish do not live in a vacuum separate from larger society but are affected by mainstream views. Research indicates many Amish parents who indicate opposition or hesitancy to vaccines cite reasons like those of non-Amish parents (Kettunen et al., 2017; Scott et al., 2021; Wenger & Wenger, 1988; Yoder & Dworkin, 2006). Scott et al. (2021) found that Amish and Old Order Mennonite parents in the Holmes County, Ohio, settlement cite too many side effects as the primary reason for vaccine refusal. Parents also fear that vaccines could have dangerous chemicals and that there are too many shots on the vaccine schedule. These reasons for refusal or hesitancy are relatively constant over time and across settlements. Wenger et al. (2011)

note the concerns about side effects and ingredients are the top concerns cited by parents in the same settlement a decade prior, and Kettunen et al. (2017) report fear of too many vaccines as a barrier to following the vaccination schedule among Amish parents in Ashtabula County, Ohio. Similarly, Yoder and Dworkin (2006) note that vaccine-hesitant parents cite vaccine safety in an Amish community in Illinois.

Surveys of Amish parents broadly indicate vaccine refusal and hesitancy are not for religious reasons. Yoder and Dworkin (2006) indicate only a tiny percentage of respondents in their sample indicate religious objections as a reason for vaccine refusal. Kettunen et al. (2017) report similar findings, showing that religious attitudes did not significantly affect parents' vaccination decisions. Scott et al. (2021) and Wenger et al. (2011) assess religion through questions about faith in God and whether ministers or bishops in the community influenced respondents' vaccination decisions. A negligible percentage of respondents in those studies suggested such factors shaped their choices. These survey questions, however, may not resonate with respondents in a way that reflects their worldview. We examine Amish and Old Order Mennonite respondents' written comments on a vaccine survey to explore their vaccination attitudes and behaviors through their moral worldviews.

Data and Methods

In early 2020, the New Leaf Center, a clinic serving the needs of families with children with genetic diseases, distributed a survey about vaccination practices and cartilage hair hypoplasia to approximately 1,000 Amish and Old Order Mennonite families in Holmes County, Ohio, and surrounding areas. The survey was sent to a random sample of 410 families in the Holmes County Amish directory, 250 from the New Leaf Center's patient database, 296 Swartzentruber Amish families, and 38 Old Order Mennonite families. The overall survey had a 39% response rate; 71% of the respondents were Old Order Amish, 11% Dan Amish, 10% Swartzentruber Amish, 7% Old Order Mennonite, and 1% New Order Amish (see also Stein et al., 2022).

In their study using the same data, Scott et al. (2021) reported that 27% of the survey respondents had a child with special needs living at home. Parents of such children are more likely to give all or some of the required vaccinations than those without special needs children in the home. Such parents were also more likely to believe in vaccine effectiveness (Scott et al., 2021; Stein et al., 2022). Stein et al. (2022) suggest that regular interactions with doctors at the New Leaf Center may contribute to the belief in vaccine effectiveness, increasing vaccine uptake. However, even with a subset of the respondents more inclined to vaccinate, almost 60% indicated they did not give their children any shots (Scott et al., 2021; Stein et al., 2022). This low vaccination rate contrasts with an earlier study, where over 85% of the families in the same regional area indicated they vaccinated their children (Wenger et al., 2011).

We examine the open-ended responses to six questions that asked respondents directly about vaccinating their children. There were 232 total open-ended responses to these questions. The survey asked respondents to answer questions about vaccines or baby shots based on their special needs child or their youngest child if they did not have a special needs child. The first question

asked respondents about their plans for giving baby shots, ranging from giving all to not giving any. The following three questions sought elaboration, asking the parent to explain their rationale. The survey presented respondents with a list of options for each question and allowed them to write in a response labeled "other." The fifth question asked whether giving baby shots disagrees with respondents' spiritual beliefs (yes/no) and prompted, "if yes, please describe how." Finally, the survey asked respondents if they would give their child the new coronavirus (COVID-19) vaccine if it were to become available (yes/no) and asked them to provide additional context. Scott et al. (2021) and Stein et al. (2022) explored the quantitative results across these questions. The current study focuses on the written responses to the open-ended prompts across the six questions.

The sample for the current study is limited to 175 respondents who provided written comments on the questions of focus. Table 1 presents the affiliations of respondents offering open-ended comments on the six survey questions identified above. Over half of the respondents (53%) identified as Old Order Amish, while 18% indicated Swartzentruber affiliation. About 12% of the respondents identified as Dan Amish and another 12% as Old Order Mennonite. (See Table 1.) About 49% of the respondents in the current study indicated they did not give their children any shots. The sample subset, therefore, includes more respondents who gave their children some (32%) or all (18%) of the recommended vaccinations as compared to all survey respondents. The current sample also includes slightly more respondents who have a special needs child (32%), as compared to all survey respondents with special needs children.

Table 1

Affiliation of Respondents

Affiliation	N	%
Old Order Amish	93	53
Dan Amish	22	12
Swartzentruber Amish	31	18
Old Order Mennonite	21	12
New Order Amish	5	3
Other/Unknown	3	2
Total	175	100

We used thematic analysis to inductively code the qualitative response data, which resulted in the following themes: risks v. benefits, God and Scripture, ingredients, natural (remedies and beliefs), and influence (parents, community, tradition). Initially, one researcher read and open-coded the data to generate preliminary codes. These codes were reviewed and refined through an iterative process to develop a coding scheme that captured broader patterns across the data. Through a collaborative discussion, three researchers identified the overarching themes by grouping related codes in the data. The final codes represent two main categories, including faith in God and natural products and biblical standards. We revisited these emerging themes throughout

the coding process to ensure they accurately represented the data. Our team discussed coding discrepancies until we reached a consensus.

We then went back through each theme to explore how the comments reflected the values of faith, family, and community, identified by Yoder (2022, 2023) as central components that bind members of the Plain community together. We reference Yoder's presentation at a translational medicine conference; however, he consistently presents the three themes of faith, family, and community in his public presentations about the Amish community. His role as director at the Amish and Mennonite Heritage Center in Ohio gives him a unique insight into the Amish community; as such, we use his conceptual framework to guide our thematic analysis. Below, we present how the comments on vaccination decisions reflect the moral worldview of the Amish and Old Order Mennonite communities.

Results

The written responses to questions about baby shots offer a rationale for and against vaccination and reflect the moral worldview of Amish and Old Order Mennonite parents. We identify several themes that emerge in the qualitative comments of the vaccination survey. Amish and Old Order Mennonite parents' rationale for vaccination decisions reflects the respondents' faith in God. Faith in God also figures prominently in comments indicating the use of natural products, as God provides things of nature. In contrast, human-produced things are not God's creation and are often viewed skeptically. Many comments also reflect a biblical grounding to the decisions related to vaccine ingredients and production, from the microchip to fetal cells. We recognize comments that reflect family and community values throughout these responses.

Faith in God and Natural Products

When elaborating on whether baby shots disagreed with their spiritual beliefs, many respondents noted that if they gave their children shots, they would not be putting their faith in God. The rationale for not vaccinating indicates God is in control of their lives. While the Amish are not fatalistic, they do submit to the authority of God. The respondents present a strong sense of faith, which reflects the moral core and values of the Amish and Old Order Mennonite people. One Swartzentruber Amish respondent notes, "We depend on God for our health, not shots. If God intends us to get sick, we want to endure it with patience." This respondent's ultimate trust in God is evident. Their consideration looks past disease risk, trusting that God is in control. Gelassenheit, or the submission to higher authority, animates this comment.

The respondents indicated not only a trust in God but also a trust in nature. If one is to trust in God, one should also trust what God provides; that is, things in nature or natural products. As such, we find some Amish respondents give a rationale behind their decisions not to vaccinate, emphasizing using natural products rather than mainstream medicine. A Swartzentruber Amish respondent notes, "I feel that we should rely on God's herbs instead of man-made chemicals as much as possible." Using natural products, or products from God, aligns with values associated with trust in God. Submission to a higher authority can also be linked to tradition and family

values. An Amish respondent, for example, notes they did not vaccinate their children and indicates, "Our parents and grandparents believe in the body's natural immune systems." This viewpoint reflects not only the reliance on family values but also submission to God and God's creation, including the body's natural resilience.

Respondents' adherence to natural products reflects moral values based on biblical standards. An Amish respondent notes, "Our bodies are our temple. Why inject them with harmful toxins/chemicals? God instructs us to care for our bodies." Another Amish respondent writes, "If we want to be the temple of the living God, we should not defile it with something that can change our genetical mind and body." If natural products are trusted because God provides them, then manufactured things are less trustworthy, as God does not create them. One Amish respondent who reports they do not vaccinate writes, "I like natural stuff and shots are NOT natural." Even more clearly, an Old Order Mennonite respondent notes, "God did not send us with baby shots." Indeed, several respondents noted the consequences of vaccinating children could be extreme, reporting some children they knew who were healthy before receiving shots and became disabled after receiving them. In another example, an Amish respondent writes, "We gave our oldest children baby shots, and one of them got cancer at a young age. Research shows us that shots mess with the immune system."

Distrust of vaccines does not lead to refusal across all respondents, as some respondents highlight selective vaccination practices. Some respondents who selectively vaccinate believe too many vaccines at the same time might be harmful to children. They often support these statements with anecdotes of experience. One Amish parent writes, "We gave our oldest child her shots and she got really sick with fever etc. for 2 days afterward." Another Amish respondent notes, "We gave 2 shots then quit because she got so terrible sick." Some families with special needs children report similar adverse reactions. One Amish parent, for example, writes, "Our special needs daughter reacted to the DPT shots. Seizure and got high fevers." Other families with special needs children, however, report alternative experiences. An Amish respondent who reports following the vaccine schedule notes, "We are worried that our special needs children won't be able to survive the diseases the baby shots prevent."

A minority of respondents, while anchored to faith and trust in God at the core, provide a critique of the Amish and Mennonites who rely heavily on natural products. An Old Order Mennonite respondent writes, "Amish and Mennonites tend to work on farms with animals and nature, so nature makes sense to them. They understand natural products when in fact in some cases these products could possibly do more harm than good." Another Old Order Mennonite respondent notes the problem broadly in the Amish community: "We feel there is a lot of thinking that 'all-natural' is a better way of life and immunizations and antibiotics don't fit that category. Don't know if anything can stem that tide, but it is worth a try." These critiques chasten the views of people who consider natural products safer; however, this viewpoint is uncommon across respondents.

One Amish respondent clearly notes that people in the same church district hold different opinions on vaccination. They state, "In the community we live, baby shots are varied in opinions

(more than beliefs); it has to do with some people are for all natural health (organic, etc.) while others are for medical ways, so the people in the same church with same convictions can strongly disagree when it comes to shots." Of note, this respondent clarifies the different thoughts about baby shots are opinions, not beliefs. The respondent indicates people with the same core religious beliefs have different views on vaccinations. This respondent continues, indicating the importance of family values in decisions: "My parents didn't give shots and my husband's parents did and they were considered the same." This respondent points out that while vaccination behaviors differ across families, others in the community do not necessarily judge these families for their choices. Essentially, the families share a moral core—related to Gelassenheit, unrelated to vaccination decisions.

Biblical Standards

Respondents consistently articulate moral values based on biblical standards. References to biblical texts are evident in comments related to specific vaccine ingredients, including concerns about microchips added to vaccines. These comments echo the mainstream narrative of microchips in vaccines that gained widespread media attention during COVID-19. One Swartzentruber Amish respondent writes, "Most concern is that they are able to inject the computer chip (666) with the flu shot. Read Rev [Revelations] 13." Another Swartzentruber Amish respondent notes, "Also in the near future the microchip being sneaked into humans by vaccine." These comments reflect concerns raised by conservative Christian groups (Trangerud, 2023).

While research indicates Christian nationalists, for example, are relatively steadfast in their distrust of vaccines (Corcoran, Scheitle, et al., 2021; DiGregorio et al., 2022; Whitehead & Perry, 2020), several Amish respondents note uncertainty as to the validity of anti-vax claims regarding microchips. For example, in response to whether they would give their child the COVID-19 vaccine, one respondent asked, "Is it true that they want to put chip into each vaccine?" and another indicated, "If there is a chip involved I would not." These statements reflect the biblical values opposed to injecting a microchip but indicate the respondents are not entirely convinced there is truth to the mainstream narrative of chips being injected as part of vaccination practices.

We find similar results regarding the use of fetal cells in vaccine production. Consistently, respondents note that the use of fetal cells in vaccine production is immoral. The Amish and Old Order Mennonites, like conservative Christians, believe in the sanctity of life and are strongly opposed to any form of abortion. For example, an Old Order Mennonite respondent notes, "It bothers us that they have to use tissues from aborted babies," and an Amish respondent writes, "Some shots are made using parts of aborted babies." However, several comments indicate that respondents are unclear about the link between fetal cells and vaccines. One Amish respondent, for example, writes, "We have read that certain vaccines contain parts of aborted babies which we strongly disapprove of (is this true?)" and another Amish respondent states, "I was told baby shots are taken from an aborted baby fetus. I have always wondered if this was true." The questions raised about vaccine production and the uncertainty of fetal cell use in production make the narrative of Amish and Old Order Mennonite respondents different than those in conservative

Christian groups, who express more certainty in the link between vaccine production and the use of fetal cells.

Discussion

Research consistently shows that Amish parents do not cite religious reasons for vaccine hesitancy (Kettunen et al., 2017; Scott et al., 2021; Wenger et al., 2011; Yoder & Dworkin, 2006). Instead, reasons for vaccine refusal and hesitancy among the Amish reflect mainstream society. More specifically, parents indicate concern over vaccine ingredients and express concern that children receive too many vaccines (Gellin et al., 2000; Kettunen et al., 2017; Meszaros et al., 1996; Salmon et al., 2005; Scott et al., 2021; Wenger et al., 2011; Whyte et al., 2011; Williams, 2014; Yoder & Dworkin, 2006). In an exploration of written comments on a vaccine survey, however, we find that Amish parents assess vaccines through their worldview, focusing on faith, family, and community (Yoder, 2022, 2023).

The Amish are not unique in expressing concerns about vaccines through their worldview. Researchers consistently note the importance of religious beliefs as driving vaccine hesitancy or refusal (Capurro et al., 2022; Ganga Kieffer, 2023; Levin & Bradshaw, 2022). In a survey of Orthodox Protestants in the Netherlands, Ruijs et al. (2012) found that vaccine-hesitant respondents often use religious justifications for their decisions. Religious views also drive vaccine hesitancy in a sample of Canadian residents in the Southern Health Region (Capurro et al., 2022). These authors point out that the Southern Health Region is often referred to as Manitoba's Bible Belt, comprised of conservative Christian residents. Ganga Kieffer (2023) observed that while vaccine skepticism is an individualistic decision, this choice reflects core religious values. In recent studies on the COVID-19 pandemic and vaccination campaigns, researchers found potent links between Christian nationalism and vaccine hesitancy, emphasizing how religious ideals guide behaviors (Corcoran, Scheitle, et al., 2021; Whitehead & Perry, 2020).

While analysts generally categorize Amish and Old Order Mennonites as vaccine hesitant, we capture a range of responses to vaccines in the survey comments. Quantitative research suggests that while many Amish people and Older Order Mennonites resist the full vaccination schedule, respondents are not likely to identify religious beliefs as the primary reason for their hesitancy (Scott et al., 2021; Stein et al., 2022; Wenger et al., 2011). However, the qualitative results of a vaccination decision survey imply that religious beliefs, the importance of tradition, and the solidarity of family and community are underlying factors that influence the rationales respondents provide for not vaccinating children.

Tradition, family, and community also provide Amish and Old Order Mennonite respondents with rationale for vaccination decisions. Because Amish and Old Order Mennonite traditions do not prohibit vaccinations, Amish and Old Order Mennonite parents decide for their families whether to vaccinate their children, which may explain the variation in vaccination decisions. Some respondents noted this variation even among those with the same moral worldviews. Religious values elevating natural things perceived as God's creation translated to opposition to vaccines for some parents who viewed them as unnatural, but not for others. Thus, decisions

regarding vaccines may trigger specific moral values for some parents and other moral values for others. More research is needed on this front.

While the Amish and Old Order Mennonites are often considered tight-knit communities due to the frequency of within-group interaction, that doesn't mean they are impervious to outside, non-Plain people's influence. Indeed, many Amish and Old Order Mennonite people interact with non-Plain people regularly at work, while traveling, doing errands, shopping, and various other daily activities. Several researchers note the role of non-Amish "taxi" drivers, who transport Amish to these various activities (Harasta, 2021; Stoltzfus, 2021; Thomas et al., 2021). Drivers may pass along information they have heard in mainstream or social media. Stoltzfus (2021), for example, notes that during the COVID-19 pandemic, the drivers were likely to share stories about the COVID-19 vaccine, including how the government was using computer chips in the shots to track people's movement. Additionally, Thomas et al. (2021) report van drivers often tune in to conservative talk radio, allowing the passengers to pick up the broadcasted messaging.

Perhaps because of this exposure, we see much overlap between the Amish responses and mainstream, conservative Christian narratives. These suspicions convey conspiracy tropes of microchips, aborted fetal material, and other evil vaccine ingredients. Notably, some survey respondents questioned the factual status of these narratives and expressed interest in learning more about vaccines. Such curiosity allows doctors and other trusted health care providers to answer questions and correct the narratives (Duran et al., 2020; Scott et al., 2021; Stein et al., 2022).

To this end, local health departments created and mailed informational pamphlets about COVID-19, vaccines, and social distancing guidelines tailored to Amish cultural sensibilities (Harasta, 2021). However, many Amish people take cues from non-Amish, rural neighbors, who were generally less compliant with government-directed pandemic mitigation tactics, such as masking, social distancing, and staying home (Harasta, 2021). Local newspapers conveyed inconsistent messages about the pandemic's seriousness, and Amish leaders differed in their understanding of COVID-19's threat to communities, preventing unified messaging from Amish bishops (Stoltzfus, 2021). The informal conversations among families and friends reflected a wide range of viewpoints on disease and the pandemic, and stances on vaccination (Harasta, 2021; Stoltzfus, 2021).

Public health systems seek to limit disease spread within communities. Vaccines play a central role in this mission. Public health officials who wish to increase vaccination rates in the Amish and Old Order Mennonite communities must first understand how people derive behavior (related to vaccines and other health decisions) from moral worldviews. Rather than viewing these communities as homogenous, public health officers must recognize variations in worldview and practice. Prior vaccination campaigns targeting vaccine-preventable disease outbreaks in Amish populations (including smallpox and measles) succeeded. In those cases, Amish people may have interpreted vaccination as their neighborly duty (Huntington, 2003; Stein, 2023; Stein et al., 2022). However, other campaigns to intervene in vaccine-preventable disease outbreaks in Amish communities (e.g., rubella) were unsuccessful (Briss et al., 1992; Jackson et al., 1993). These

successful and unsuccessful campaigns hinged on the moral meanings at play. Amish people were more likely to engage with the campaign when doing so was framed as a service to others, as opposed to a self-interested strategy to avoid illness. Public health officers and other health care providers can more effectively convey vaccines as a value proposition by recognizing these moral foundations.

The current study's findings point out that many Amish and Mennonite people continue to place their faith in God and want to rely on natural products whenever possible. These core values shape vaccination behavior. Many Amish people seek alternative care before turning to mainstream medicine (Garrett-Wright et al., 2020; Schafft, 2020; Talpos, 2016). Reflexive dismissal of these strategies by doctors and other health providers feeds counterproductive tensions. While conventional medical practitioners may not agree with all alternative care methods, they should acknowledge the efforts in a way that does not blame the patients (Garrett-Wright et al., 2020; McCrea, 2022; Thomas et al., 2021).

Most importantly, medical professionals should take time to listen to their Amish patients (Garrett-Wright et al., 2020; Louden, 2020; McCrea, 2022; Schafft, 2020). Doctors can build a trusting relationship with Amish patients by explaining diagnoses and treatment options in plain language and leaving space for questions (Garrett-Wright et al., 2020; Louden, 2020; McCrea, 2022). If there is a trusting relationship between the Amish and local doctors, the patients are more likely to listen to the advice of the doctors or local health officials (Duran et al., 2020). Such dynamics become especially important during outbreaks (Armer & Radina, 2006; Medina-Marino et al., 2013; Stein et al., 2022).

This study has some limitations. The sample comes from one Ohio settlement and is not large enough to distinguish the vaccination attitudes of different Amish affiliations or between the Amish and Old Order Mennonite respondents. However, a benefit of the sample is that it included respondents from the Swartzentruber Amish group who do not submit information to Amish church directories, which makes it challenging to study them (Scott et al., 2021). Additionally, our sample of qualitative comments were those provided optionally in "other" categories. They may, therefore, represent those with the strongest views who were thus willing to write in their responses. Still, the qualitative comments provide rich descriptive information for understanding vaccination decisions beyond what prior primarily quantitative studies have provided. Survey respondents were asked to answer vaccination questions regarding their child with a genetic disorder or, if they do not have one, their youngest child. We do not know if the responses would have been different if they were regarding another child. Lastly, the response rate for the survey was 39%. We do not have information on those who chose not to respond and, thus, cannot calculate differences in responses between responders and nonresponders. The results may be affected by response bias and should be interpreted accordingly.

This study highlights the importance of moral worldviews for understanding the vaccination attitudes and decisions of Amish and Old Order Mennonite communities. Within these communities, there is variation in vaccination decisions and the reasonings beyond them. Further research is needed to elucidate the contexts and factors that lead some Plain people to link vaccines

to religious values interpreted as opposing, supporting, or being neutral to vaccination. The results of this study suggest that family and community connections and interactions may be fruitful avenues for doing so.

References

Armer, J. M., & Radina, M. E. (2006). Definition of health and health promotion behaviors among midwestern Old Order Amish families. *Journal of Multicultural Nursing and Health*, *12*(3), 44–53.

Ball, L. K., Evans, G., & Bostrom, A. (1998). Risky business: Challenges in vaccine risk communication. *Pediatrics*, *101*(3), 453–458. https://doi.org/10.1542/peds.101.3.453

Bedford, H., & Elliman, D. (2000). Concerns about immunisation. *British Medical Journal*, *320*(7229), 240–243. https://doi.org/10.1136/bmj.320.7229.240

Begg, N., & Nicoll, A. (1994). Myths in medicine: Immunisation. *British Medical Journal*, *309*(6961), 1073–1075. https://doi.org/10.1136/bmj.309.6961.1073

Boyce, T. G. (2007). Vaccination usage among the Amish. *The Pediatric Infectious Disease Journal*, *26*(4), 370. https://doi.org/10.1097/01.inf.0000257451.77938.9b

Brewer, N. T., Gottlieb, S. L., Reiter, P. L., McRee, A.-L., Liddon, N., Markowitz, L., & Smith, J. S. (2011). Longitudinal predictors of human papillomavirus vaccine initiation among adolescent girls in a high-risk geographic area. *Sexually Transmitted Diseases*, *38*(3), 197–204. https://doi.org/10.1097/OLQ.0b013e3181f12dbf

Briss, P. A., Fehrs, L. J., Hutcheson, R. H., & Schaffner, W. (1992). Rubella among the Amish: Resurgent disease in a highly susceptible community. *The Pediatric Infectious Disease Journal*, *11*(11), 955–959. https://doi.org/10.1097/00006454-199211110-00010

Bults, M., Beaujean, D. J. M. A., Richardus, J. H., van Steenbergen, J. E., & Voeten, H. A. C. M. (2011). Pandemic influenza A (H1N1) vaccination in the Netherlands: Parental reasoning underlying child vaccination choices. *Vaccine*, *29*(37), 6226–6235. https://doi.org/10.1016/j.vaccine.2011.06.075

Capurro, G., Maier, R., Tustin, J., Jardine, C. G., & Driedger, S. M. (2022). "They're trying to bribe you and taking away your freedoms": COVID-19 vaccine hesitancy in communities with traditionally low vaccination rates. *Vaccine*, *40*(50), 7280–7287. https://doi.org/10.1016/j.vaccine.2022.10.058

Conis, E. (2015). *Vaccine nation: America's changing relationship with immunization*. University of Chicago Press. https://doi.org/10.7208/chicago/9780226923772.001.0001

Constantine, N. A., & Jerman, P. (2007). Acceptance of human papillomavirus vaccination among Californian parents of daughters: A representative statewide analysis. *Journal of Adolescent Health*, *40*(2), 108–115. https://doi.org/10.1016/j.jadohealth.2006.10.007

Corcoran, K. E., Scheitle, C. P., & DiGregorio, B. D. (2021). Christian nationalism and COVID-19 vaccine hesitancy and uptake. *Vaccine*, *39*(45), 6614–6621. https://doi.org/10.1016/j.vaccine.2021.09.074

Corcoran, K. E., Stein, R. E., Colyer, C. J., Mackay, A. M., & Guthrie, S. K. (2021). Global contexts: How countries shape the COVID-19 experience of Amish and Mennonite missionaries abroad. *Religions*, *12*(10), 790. https://doi.org/10.3390/rel12100790

DiGregorio, B. D., Corcoran, K. E., & Scheitle, C. P. (2022). 'God will protect us': Belief in God/Higher Power's ability to intervene and COVID-19 vaccine uptake. *Review of Religious Research*, *64*(3), 475–495. https://doi.org/10.1007/s13644-022-00495-0

Dubé, E., Laberge, C., Guay, M., Bramadat, P., Roy, R., & Bettinger, J. A. (2013). Vaccine hesitancy: An overview. *Human Vaccines & Immunotherapeutics*, *9*(8), 1763–1773. https://doi.org/10.4161/hv.24657

Duran, D., Jack, S., Medina-Martinez, G., Pearson, M., Oliveira, S., & Campbell, E. (2020). *Community assessment of COVID-19 Elkhart County, IN*. https://health.elkhartcounty.com/documents/752/COVID-19_Elkhart_IN_Final_Report_STLT_ADS_Cleared_JIC_Lead_Cleared_CLEAN_OCT_09_2020.pdf

Galbraith, K. V., Lechuga, J., Jenerette, C. M., Moore, A. D., Palmer, M. H., & Hamilton, J. B. (2016). Parental acceptance and uptake of the HPV vaccine among African-Americans and Latinos in the United States: A literature review. *Social Science & Medicine*, *159*, 116–126. https://doi.org/10.1016/j.socscimed.2016.04.028

Ganga Kieffer, K. (2023). *Pure bodies, sacred authority: A religious history of vaccine hesitancy in the United States* [Doctoral dissertation, Boston University]. Boston University Theses & Dissertations. https://hdl.handle.net/2144/49059

Garrett-Wright, D., Main, M. E., & Jones, M. S. (2020). Health care providers' understanding of health care beliefs and preferences in Anabaptist communities. *Journal of Plain Anabaptist Communities*, *1*(1), 13–25. https://doi.org/10.18061/jpac.v1i1.7537

Gastañaduy, P. A., Budd, J., Fisher, N., Redd, S. B., Fletcher, J., Miller, J., McFadden, D. J., Rota, J., Rota, P. A., Hickman, C., Fowler, B., Tatham, L., Wallace, G. S., de Fijter, S., Parker Fiebelkorn, A., & DiOrio, M. (2016). A measles outbreak in an underimmunized Amish community in Ohio. *New England Journal of Medicine*, *375*(14), 1343–1354. https://doi.org/10.1056/NEJMoa1602295

Gellin, B. G., Maibach, E. W., Marcuse, E. K. (2000). Do parents understand immunizations? A national telephone survey. *Pediatrics*, *106*(5), 1097–1102. https://doi.org/10.1542/peds.106.5.1097

Grabenstein, J. D. (2013). What the world's religions teach, applied to vaccines and immune globulins. *Vaccine*, *31*(16), 2011–2023. https://doi.org/10.1016/j.vaccine.2013.02.026

Harasta, J. (2021). Pandemic among the Amish: A look at the effects of COVID-19 on Amish communities in Lancaster, Pennsylvania, in the first four months. *Journal of Plain Anabaptist Communities*, *2*(1), 42–61. https://doi.org/10.18061/jpac.v2i1.7982

Hilton, S., Petticrew, M., & Hunt, K. (2006). "Combined vaccines are like a sudden onslaught to the body's immune system": Parental concerns about vaccine "overload" and "immune-vulnerability." *Vaccine*, *24*(20), 4321–4327. https://doi.org/10.1016/j.vaccine.2006.03.003

Hostetler, B. S. (1987). *American Mennonites and Protestant movements: A community paradigm*. Herald Press.

Huntington, G. E. (2003). Health care. In D. B. Kraybill (Ed.), *The Amish and the state* (pp. 163–190). Johns Hopkins University Press. https://doi.org/10.56021/9780801874307

Hussain, A., Ali, S., Ahmed, M., & Hussain, S. (2018). The anti-vaccination movement: A regression in modern medicine. *Cureus*, *10*(7), e2919. https://doi.org/10.7759/cureus.2919

Jackson, B. M., Payton, T., Horst, G., Halpin, T. J., & Mortensen, B. K. (1993). An epidemiologic investigation of a rubella outbreak among the Amish of northeastern Ohio. *Public Health Reports*, *108*(4), 436–439.

Katz, M. L., Reiter, P. L., Heaner, S., Ruffin, M. T., Post, D. M., & Paskett, E. D. (2009). Acceptance of the HPV vaccine among women, parents, community leaders, and healthcare providers in Ohio Appalachia. *Vaccine*, *27*(30), 3945–3952. https://doi.org/10.1016/j.vaccine.2009.04.040

Keane, M. T., Walter, M. V., Patel, B. I., Moorthy, S., Stevens, R. B., Bradley, K. M., Buford, J. F., Anderson, E. L., Anderson, L. P., Tibbals, K., & Vernon, T. M. (2005). Confidence in vaccination: A parent model. *Vaccine*, *23*(19), 2486–2493. https://doi.org/10.1016/j.vaccine.2004.10.026

Kettunen, C., Nemecek, J., & Wenger, O. (2017). Evaluation of low immunization coverage among the Amish population in rural Ohio. *American Journal of Infection Control*, *45*(6), 630–634. https://doi.org/10.1016/j.ajic.2017.01.032

Kraybill, D. B., & Hurd, J. P. (2006). *Horse-and-buggy Mennonites: Hoofbeats of humility in a postmodern world*. Pennsylvania State University Press.

Levin, J., & Bradshaw, M. (2022). Determinants of COVID-19 skepticism and SARS-CoV-2 vaccine hesitancy: Findings from a national population survey of U.S. adults. *BMC Public Health*, *22*(1), Article 1047. https://doi.org/10.1186/s12889-022-13477-2

Louden, M. L. (2020). Plain talk About health: Linguistic aspects of mediation between Amish and Mennonites and health care professionals. *Journal of Plain Anabaptist Communities*, *1*(1), 1–12. https://doi.org/10.18061/jpac.v1i1.7803

McCrea, K. (2022). Perceived health care needs of Amish populations in two newly established districts. *Journal of Plain Anabaptist Communities*, *2*(2), 44–58. https://doi.org/10.18061/jpac.v2i2.8262

Medina-Marino, A., Reynolds, D., Finley, C., Hays, S., Jones, J., & Soyemi, K. (2013). Communication and mass vaccination strategies after pertussis outbreak in rural Amish communities—Illinois, 2009–2010. *Journal of Rural Health*, *29*(4), 413–419. https://doi.org/10.1111/jrh.12019

Meszaros, J. R., Asch, D. A., Baron, J., Hershey, J. C., Kunreuther, H., & Schwartz-Buzaglo, J. (1996). Cognitive processes and the decisions of some parents to forego pertussis vaccination for their children. *Journal of Clinical Epidemiology*, *49*(6), 697–703. https://doi.org/10.1016/0895-4356(96)00007-8

Nicoll, A., Elliman, D., & Begg, N. T. (1989). Immunisation: Causes of failure and strategies and tactics for success: Strong professional commitment is the key. *British Medical Journal*, *299*(6703), 808–812. https://doi.org/10.1136/bmj.299.6703.808

Nolt, S. M., & Meyers, T. J. (2007). *Plain diversity: Amish cultures and identities*. Johns Hopkins University Press. https://doi.org/10.1353/book.3499

Orenstein, W. A., & Hinman, A. R. (1999). The immunization system in the United States—The role of school immunization laws. *Vaccine*, *17*, S19–S24. https://doi.org/10.1016/S0264-410X(99)00290-X

Pelčić, G., Karačić, S., Mikirtichan, G. L., Kubar, O. I., Leavitt, F. J., Tai, M. C., Morishita, N., Vuletić, S., & Tomašević, L. (2016). Religious exception for vaccination or religious excuses for avoiding vaccination. *Croatian Medical Journal*, *57*(5), 516–521.

Reich, J. A. (2020). Vaccine refusal and pharmaceutical acquiescence: Parental control and ambivalence in managing children's health. *American Sociological Review*, *85*(1), 106–127. https://doi.org/10.1177/0003122419899604

Ruijs, W. L. M., Hautvast, J. L. A., van IJzendoorn, G., van Ansem, W. J. C., van der Velden, K., & Hulscher, M. E. (2012). How orthodox Protestant parents decide on the vaccination of their children: A qualitative study. *BMC Public Health*, *12*, Article 408. https://doi.org/10.1186/1471-2458-12-408

Salmon, D. A., Moulton, L. H., Omer, S. B., deHart, M. P., Stokley, S., & Halsey, N. A. (2005). Factors associated with refusal of childhood vaccines among parents of school-aged children: A case-control study. *Archives of Pediatrics & Adolescent Medicine*, *159*(5), 470–476. https://doi.org/10.1001/archpedi.159.5.470

Schafft, G. (2020). The choice of health care providers among Old Order Amish in a Pennsylvania valley. *Journal of Plain Anabaptist Communities*, *1*(1), 52–63. https://doi.org/10.18061/jpac.v1i1.7804

Scott, E. M., Stein, R. E., Brown, M. F., Hershberger, J., Scott, E. M., & Wenger, O. K. (2021). Vaccination patterns of the northeast Ohio Amish revisited. *Vaccine*, *39*(7), 1058–1063. https://doi.org/10.1016/j.vaccine.2021.01.022

Shelton, R. C., Snavely, A. C., De Jesus, M., Othus, M. D., & Allen, J. D. (2013). HPV vaccine decision-making and acceptance: Does religion play a role? *Journal of Religion and Health*, *52*(4), 1120–1130. https://doi.org/10.1007/s10943-011-9553-x

Smailbegovic, M. S., Laing, G. J., & Bedford, H. (2003). Why do parents decide against immunization? The effect of health beliefs and health professionals. *Child: Care, Health, & Development*, *29*(4), 303–311. https://doi.org/10.1046/j.1365-2214.2003.00347.x

Smith, P. J., Chu, S. Y., Barker, L. E. (2004). Children who have received no vaccines: Who are they and where do they live? *Pediatrics*, *114*(1), 187–195. https://doi.org/10.1542/peds.114.1.187

Stein, R. E. (2023). Epidemics and echo chambers: What the pandemic teaches us about beliefs, behaviors, and community. *Journal of Plain Anabaptist Communities*, *3*(2), 89–104. https://doi.org/10.18061/jpac.v3i2.9366

Stein, R. E., Corcoran, K. E., Colyer, C. J., & DiGregorio, B. D. (2022). Echo chambers in a closed community: Vaccine uptake and perceived effectiveness among the Amish and Old Order Mennonites. *Sociological Quarterly*, *64*(1), 165–186. https://doi.org/10.1080/00380253.2022.2053315

Stoltzfus, V. E. (2021). Responses to the COVID-19 pandemic among the Amish of northern Indiana. *Journal of Plain Anabaptist Communities*, *1*(2), 126–131. https://doi.org/10.18061/jpac.v1i2.8099

Talpos, S. (2016, May 18). *Six ways to make a hospital better for Amish patients*. Mosaic. https://web.archive.org/web/20220701105551/https:/mosaicscience.com/story/six-ways-make-hospital-better-amish-patients/

Taylor, J. A., & Newman, R. D. (2000). Parental attitudes toward varicella vaccination. *Archives of Pediatrics & Adolescent Medicine*, *154*(3), 302–306. https://doi.org/10.1001/archpedi.154.3.302

Thomas, M., Byler, I., Marrero, K., Miller, J., & Donnermeyer, J. F. (2021). Attitudes and beliefs of COVID-19 and vaccine uptake among Amish women. *Journal of Plain Anabaptist Communities*, *2*(1), 28–41. https://doi.org/10.18061/jpac.v2i1.8310

Tickner, S., Leman, P. J., & Woodcock, A. (2007). 'It's just the normal thing to do': Exploring parental decision-making about the 'five-in-one' vaccine. *Vaccine*, *25*(42), 7399–7409. https://doi.org/10.1016/j.vaccine.2007.08.008

Trangerud, H. A. (2023). "What is the problem with vaccines?" A typology of religious vaccine skepticism. *Vaccine: X*, *14*, 100349. https://doi.org/10.1016/j.jvacx.2023.100349

Walsh, S., Thomas, D. Rh., Mason, B. W., & Evans, M. R. (2015). The impact of the media on the decision of parents in South Wales to accept measles-mumps-rubella (MMR) immunization. *Epidemiology and Infection*, *143*(3), 550–560. https://doi.org/10.1017/S0950268814000752

Wellman, J. K., Jr. (2008). *Evangelical vs. liberal: The clash of Christian cultures in the Pacific Northwest*. Oxford University Press.

Wellman, J. K., Jr. & Keyes, M. (2007). Portable politics and durable religion: The moral worldviews of American evangelical missionaries. *Sociology of Religion*, *68*(4), 383–406. https://doi.org/10.1093/acprof:oso/9780195300116.001.0001

Wenger, A. F. Z., & Wenger, M. (1988). Community and family care patterns of the Old Order Amish. In M. M. Leininger (Ed.), *CARE: Discovery and Uses in Clinical and Community Nursing*. Wayne State University Press.

Wenger, O. K., McManus, M. D., Bower, J. R., & Langkamp, D. L. (2011). Underimmunization in Ohio's Amish: Parental fears are a greater obstacle than access to care. *Pediatrics*, *128*(1), 79–85. https://doi.org/10.1542/peds.2009-2599

Whitehead, A. L., & Perry, S. L. (2020). How culture wars delay herd immunity: Christian nationalism and anti-vaccine attitudes. *Socius: Sociological Research for a Dynamic World*, *6*, Article 237802312097772. https://doi.org/10.1177/2378023120977727

Whyte, M. D., Whyte, J., IV, Cormier, E., & Eccles, D. W. (2011). Factors influencing parental decision making when parents choose to deviate from the standard pediatric immunization schedule. *Journal of Community Health Nursing*, *28*(4), 204–214. https://doi.org/10.1080/07370016.2011.615178

Williams, S. E. (2014). What are the factors that contribute to parental vaccine-hesitancy and what can we do about it? *Human Vaccines & Immunotherapeutics*, *10*(9), 2584–2596. https://doi.org/10.4161/hv.28596

Williamson, G., Ahmed, B., Kumar, P. S., Ostrov, B. E., & Ericson, J. E. (2017). Vaccine-preventable diseases requiring hospitalization. *Pediatrics*, *140*(3), Article e20170298. https://doi.org/10.1542/peds.2017-0298

Wolfe, R. M., & Sharp, L. K. (2002). Anti-vaccinationists past and present. *British Medical Journal*, *325*(7361), 430–432. https://doi.org/10.1136/bmj.325.7361.430

Wombwell, E., Fangman, M. T., Yoder, A. K., & Spero, D. L. (2015). Religious barriers to measles vaccination. *Journal of Community Health*, *40*(3), 597–604. https://doi.org/10.1007/s10900-014-9956-1

Wong, L. P., Wong, P. F., & AbuBakar, S. (2020). Vaccine hesitancy and the resurgence of vaccine preventable diseases: The way forward for Malaysia, a Southeast Asian country. *Human Vaccines & Immunotherapeutics*, *16*(7), 1511–1520. https://doi.org/10.1080/21645515.2019.1706935

Yoder, J. S., & Dworkin, M. S. (2006). Vaccination usage among an Old-Order Amish community in Illinois. *The Pediatric Infectious Disease Journal*, *25*(12), 1182–1193. https://doi.org/10.1097/01.inf.0000246851.19000.3e

Yoder, M. (2022). A sturdy sapling in the trans-Appalachian west: The origins and development of the Holmes County Amish community, 1809–1846. *Journal of Plain Anabaptist Communities*, *2*(2), 1–25. https://doi.org/10.18061/jpac.v2i2.8728

Yoder, M. (2023, August 10). *The ties that bind the Plain community*. Translational Medicine in Plain Populations Conference, Wooster, OH.

Zimmerman Umble, D. (1996). *Holding the line: The telephone in Old Order Mennonite and Amish life*. Johns Hopkins University Press. https://doi.org/10.56021/9780801853128