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Communicating vaccine safety to religiously hesitant parents: A mind genomics backgrounder using AI

Abstract

Religiously motivated vaccine hesitancy is often shaped by faith, values, and moral concerns rather than by a lack of scientific information. In such situations, simply presenting vaccine facts may be insufficient and can sometimes increase resistance. This paper explores how an AI-driven Training Backgrounder, informed by Mind Genomics, can support more respectful and effective reasoning with religiously motivated anti-vaccine parents. The Backgrounder combines two complementary approaches. Artificial intelligence is used to gather and summarize reliable scientific evidence about vaccine safety and disease prevention in clear, accessible language. Mind Genomics adds a structured framework for understanding how parents think and make decisions, highlighting that people respond to specific ideas aligned with their beliefs rather than to facts alone. Using AI-generated simulations, the study illustrates how different religiously grounded mind-sets respond differently to message framing, including themes of stewardship, community responsibility, divine wisdom, and harmony between faith and medicine. The findings indicate variability in how religiously motivated parents respond to vaccine-related messages, with value-aligned messaging performing more effectively than fear-based or corrective approaches. The work further suggests that this Backgrounder can serve as a foundation for future empirical Mind Genomics studies with real respondents and for the development of practical clinical communication tools that help health professionals tailor vaccine conversations more effectively.

Keywords: vaccine hesitancy, religious beliefs, communication strategies, artificial intelligence, mind genomics, message framing, faith and medicine

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Introduction

Vaccines are among the most effective public health interventions, protecting children and adults against serious infectious diseases. Commonly recommended vaccines include measles, mumps, and rubella (MMR), polio, diphtheria, tetanus, and pertussis (DTaP/Tdap), Haemophilus influenzae type b (Hib), hepatitis B, hepatitis A, influenza (flu), pneumococcal, human papillomavirus (HPV), and varicella (chickenpox). These vaccines have dramatically reduced morbidity and mortality worldwide and remain central to strategies for preventing outbreaks and safeguarding communities.[1–3] Yet some parents remain hesitant due to religious or moral concerns.

Understanding how to reason with religiously motivated anti-vaccine parents begins with recognizing that vaccines protect children from diseases that once caused enormous suffering. Many families hesitate because they fear harm, even though decades of evidence show vaccines prevent illness safely and reliably.[4] When vaccination rates fall, outbreaks of preventable diseases rise quickly to threaten entire communities.[5] Parents often respond better to calm explanations of risk than to arguments that challenge their beliefs directly.[6] People make choices based on stories, values, and trust, not only on facts, so reasoning must connect to what matters most to parents.[7]

Belief systems strongly shape parental decisions. People often rely on intuitive thinking when facing complex health choices, especially under fear or uncertainty.[8] Religious identity can influence how parents interpret scientific information, making trust more important than technical detail.[9] Respectful communication that acknowledges values increases openness and reduces defensiveness.[10] Parents who refuse vaccines rarely reject science entirely; instead, they prioritize moral or spiritual concerns that feel more immediate than statistical evidence.[11]

Effective reasoning also depends on strategies that actually change minds. Clear explanations of disease risk, delivered with empathy, increase acceptance more than pressure or authority.[12] Storytelling—especially accounts of real children harmed by preventable diseases—helps parents grasp risks that statistics alone cannot convey.[13] Trusted messengers such as clergy, community leaders, or physicians with shared values play a crucial role in shaping decisions.[14] When parents understand how vaccines work in the body, confidence increases because the process feels less mysterious and more predictable.[15]

The concept of an AI/Mind Genomics 'Training Backgrounder'

The AI/Mind Genomics Training Backgrounder brings together two powerful tools that help people quickly understand complicated issues like vaccine hesitancy among religiously motivated parents, using clear facts and simple reasoning. It uses AI to gather verified scientific information about vaccines, disease risks, and community protection, presenting these facts in ways that are easy for anyone to grasp, regardless of background or training. Mind Genomics adds the second essential piece by showing how real people make everyday decisions, revealing the mental shortcuts, beliefs, and emotional triggers that shape their choices. When these two approaches work together, the result is a practical guide that helps students, professionals, and the public understand both the science and the psychology behind vaccine decisions. This combination matters because facts alone rarely change minds and understanding decision-making patterns helps communicators speak in ways that people can hear. The Backgrounder therefore becomes a tool that brings people "up to date" on both the evidence and the human thinking behind the issue. It offers a structured, rapid way to learn, created with real data and real human behavior.

The Backgrounder first documents how AI rapidly gathers peer-reviewed evidence about vaccine effectiveness, disease prevention, and population-level safety, giving learners a clear and factual foundation for understanding the issue. It explains how AI systems scan large bodies of research to identify consistent findings, such as the strong evidence supporting routine childhood vaccination for preventing severe illness. The Backgrounder is intended to help users understand that scientific consensus emerges from repeated, independent studies rather than opinion or authority. It also demonstrates how AI can summarize this consensus in ways that are simple, direct, and accessible to the public. This topic gives every learner a reliable starting point for understanding vaccine safety.

Next the Backgrounder teaches how Mind Genomics uncovers the decision-making patterns behind vaccine resistance. Mind Genomics reveals that people make choices using small pieces of information that trigger emotional, cultural, or identity-based reactions, especially in sensitive areas like childhood vaccination. The Backgrounder demonstrates how experimental designs can identify which messages resonate with specific groups, including religiously motivated parents who may prioritize purity, divine protection, or community norms. It teaches learners that these decision patterns are not random but follow predictable structures that can be measured and mapped. It also explains how understanding these mental patterns helps communicators avoid arguments that backfire and instead use language that aligns with the listener's worldview. The Backgrounder demonstrates that people respond differently to the same information, and segmentation helps identify these differences. It shows that effective communication requires matching the message to the mindset, not simply repeating scientific facts. This topic helps learners understand why some parents resist vaccines even when strong scientific evidence exists.

Finally the Backgrounder teaches is how AI and Mind Genomics together create tailored communication strategies. The Backgrounder shows how AI can generate clear, factual explanations about vaccines while Mind Genomics identifies which explanations different groups find most believable or comforting. It teaches learners that combining these tools allows communicators to create messages that are both scientifically accurate and psychologically effective. It demonstrates how AI can produce multiple message variations, while Mind Genomics testing reveals which versions reduce fear, increase trust, or address specific religious concerns. It also explains that tailored communication is not coercive but a method for ensuring that important health information is delivered in ways people can understand and accept. The Backgrounder helps learners see that communication is most effective when it respects the listener's values while still presenting accurate scientific facts. It shows that this combined approach can reduce misunderstanding and build bridges between scientific evidence and personal belief systems. This topic gives learners a practical framework for designing messages that work in real-world conversations.

Populating the AI/Mind Genomics Backgrounder by an AI-driven Mind Genomics study to better understand the nuances of anti-vaccine attitudes among religious parents

One compelling reason to use a Mind Genomics study for persuading religiously-motivated anti-vaccine parents is the possibility of identifying specific messages which may resonate with different subgroups who share a common faith-based worldview, yet respond differently to moral, spiritual, and safety-related arguments. Mind Genomics works well here because it breaks a complex communication challenge into small, testable pieces, allowing us to see which ideas about God, duty, protection, and parental responsibility actually move people emotionally and cognitively, even when they begin with strong resistance. The method also reveals hidden mind-sets that cannot be predicted by demographics alone, showing that two parents who attend the same church may respond to entirely different types of reasoning. This segmentation is essential because religiously motivated vaccine hesitancy is not a single belief system but a cluster of overlapping concerns about purity, divine protection, community norms, and fear of worldly institutions. By testing many messages in structured combinations, the study identifies which ideas break through defensiveness and which ideas trigger rejection, giving communicators a practical roadmap for respectful, effective dialogue. The approach is grounded in decades of experimental design research showing that people respond to patterns of ideas rather than isolated statements, making Mind Genomics ideal for sensitive public-health communication (Appendix I and Table 1).[16,17]

Table 1 Four questions and four answers to each question, along with rationales. The questions and answers were created by AI. The questions are framed to deal with strongly religious feelings of parents. The answers to the four questions will become the elements of the AI-synthesized Mind Genomics study

Question 1: "What does God expect from parents regarding their children's health?"
Rationale: This question explores the belief that divine expectations guide parental decisions, a central theme among religiously motivated vaccine-hesitant parents.
Question 1 – God's Expectations
1A. *"God calls parents to use every tool He provides to protect their children."*
(Shows vaccines as God-given tools, reducing perceived conflict.)
1B. *"Scripture teaches that wise parents act, not just hope, when danger threatens."*
(Frames vaccination as active wisdom, not passive fear.)
1C. *"Parents honor God when they safeguard the bodies He entrusted to them."*
(Connects health decisions to stewardship.)
1D. *"Faithful parents do not test God by ignoring preventable risks."*
(Addresses belief that refusing vaccines demonstrates stronger faith.)
Question 2: "How does faith relate to protecting children from preventable diseases?"
Rationale: This question examines the tension between trusting God and using human tools such as medicine, a common source of internal conflict.
Question 2 – Faith and Protection
2A. *"God often works through doctors, nurses, and medicines to keep children safe."*

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Table 1 Continued.....

(Positions medical care as divine action.)

2B. *"Prayer and vaccines together form a complete shield of protection."*

(Integrates spiritual and physical protection.)

2C. *"Trusting God includes trusting the knowledge He allows humans to discover."*

(Reframes science as part of God's plan.)

2D. *"Vaccines prevent suffering, which aligns with God's desire for children's well-being."*

(Links disease prevention to divine compassion.)

Question 3: "What is the moral responsibility of parents toward their community?"

Rationale: Many religious traditions emphasize communal duty, making this a key lever for shifting attitudes.

Question 3 – Moral Responsibility

3A. *"Vaccinating your child protects newborns and elders in your faith community."*

(Highlights communal responsibility.)

3B. *"Loving your neighbor means preventing diseases that could harm them."*

(Uses a core religious commandment.)

3C. *"Churches stay healthier when families prevent outbreaks through vaccination."*

(Connects vaccines to community stability.)

3D. *"Parents strengthen their congregation by stopping disease before it spreads."*

(Frames vaccination as service to the faith community.)

Question 4: "How should parents interpret religious teachings when evaluating modern medical advice?"

Rationale: This question addresses the perceived conflict between scripture and science, helping identify messages that harmonize the two.

Question 4 – Interpreting Teachings

4A. *"Religious leaders across many traditions affirm that vaccines save lives."*

(Uses authority figures to reduce doubt.)

4B. *"Scripture encourages believers to seek knowledge and avoid ignorance."*

(Connects learning about vaccines to spiritual growth.)

4C. *"Modern medicine does not replace God; it reflects His gifts of wisdom."*

(Reconciles science with faith.)

4D. *"Parents can follow God's teachings while also following medical guidance."*

(Shows harmony between religious and medical authority.)

Table 2 shows the simulated coefficients from Total Panel, from two mind-sets, and from three mind-sets, respectively. The conventional cut-off point for Mind Genomics with human respondents has turned out to be 21, based upon analysis of data with regression modeling. The same data were analyzed twice, once with regression modeling which computed an additive constant, and once with the same data, but with regression modeling 'through the origin'. The data suggest that for coefficients estimated without the additive constant in the model, a coefficient of 20 was statistically significant.

Table 2 AI-generated simulated results from a Mind Genomics study with the vaccination elements, showing results from Total Panel, two mind-set solution, and three mind-set solution, respectively

Element (Question + Answer)	Total Panel	MS 1 of 2 – "God's Tools"	MS 2 of 2 – "Community Duty"	MS 1 of 3 – "Divine Wisdom"	MS 2 of 3 – "Faith + Medicine"	MS 3 of 3 – "Protect the Church"
Base Size	100	48	52	33	34	33
1A God calls parents…	18	22	14	20	17	16
1B Scripture teaches…	14	17	11	15	13	12
1C Parents honor God…	20	24	16	22	19	18
1D Faithful parents…	11	14	8	12	10	9
2A Works through doctors and nurses	23	15	31	18	17	34
2B Prayer and vaccines…	16	20	13	18	15	14
2C Trusting God includes…	21	27	16	24	20	19
2D Vaccines prevent suffering…	12	15	9	13	11	10
3A Protects newborns and elders…	17	14	20	13	18	21

Table 2 Continued.....

Element (Question + Answer)	Total Panel	MS 1 of 2 – "God's Tools"	MS 2 of 2 – "Community Duty"	MS 1 of 3 – "Divine Wisdom"	MS 2 of 3 – "Faith + Medicine"	MS 3 of 3 – "Protect the Church"
3B Loving your neighbor…	22	18	26	17	23	25
3C Churches stay healthier…	15	12	18	11	16	19
3D Strengthen congregation…	13	10	17	9	14	18
4A Religious leaders affirm…	14	16	12	15	13	12
4B Scripture encourages knowledge…	18	21	15	20	17	16
4C Medicine reflects God's gifts…	20	25	16	23	19	18
4D Follow God + medical guidance…	17	20	14	18	16	15

Once again, the data were synthesized by AI. AI was instructed to create data so that the mind-sets 'made sense', that the base size was 100 respondents, and that most, but not all, of the coefficients were between a low of 3 and a high of 20. The highest coefficient would be 27, generating coefficients like those found in empirical studies where there is strong mind-set segmentation. There was no need to instruct the AI to run an actual study, but rather simply simulating results might be reasonable.

Based upon the coefficients, the AI was prompted to create 'insights', based upon the strong performing elements. These elements did not have to reach the cut-off value of a coefficient equal to 21 or higher, but simply had to be relatively high. Table 3 shows the strong performing elements for the Total Panel and for the two groups of mind-sets. In turn, Table 4 shows the AI synthesis of the underlying 'story' for different types of mind-sets uncovered by AI.

Table 3 Strong performing elements for the Total panel and for the two groups of mind-sets

Total Panel

1. Messages linking science to God's wisdom (2C, 4C) score consistently high.
2. Community-duty messages (3B) also perform strongly across the full sample.
3. Fear-based or corrective messages (1D, 2D) score lower overall.
4. Parents respond best to messages that harmonize faith and action.
5. The panel prefers positive, empowering religious framing over warnings.

Mind-Set 1 of 2 – "God's Tools"

1. Strongest responses to messages portraying vaccines as God-given tools (1A, 2A, 2C).
2. This group values divine wisdom expressed through human discovery.
3. Community-duty messages are less influential.
4. They respond well to stewardship framing (1C).
5. They reject messages implying moral failure (1D).

Mind-Set 2 of 2 – "Community Duty"

1. Community-focused messages dominate (3B, 3A, 3C).
2. They respond strongly to "love your neighbor" framing.
3. God-tool messages are secondary but still positive.
4. They value protecting vulnerable church members.
5. They respond poorly to messages about personal faith conflict.

Mind-Set 1 of 3 – "Divine Wisdom"

1. Highest scores for messages linking vaccines to God's knowledge (2C, 4C).
2. They value intellectual and spiritual harmony.
3. Community messages are weaker.
4. They respond to authority-based messages (4A).
5. They dislike fear-based messages.

Mind-Set 2 of 3 – "Faith + Medicine"

1. They respond best to blended messages (2B, 4D).
2. They value cooperation between prayer and medical care.
3. Community messages are moderately strong.
4. They appreciate gentle, reassuring framing.
5. They avoid messages implying conflict between faith and science.

Mind-Set 3 of 3 – "Protect the Church"

1. Community-protection messages dominate (3B, 3A, 3C).
2. They see vaccination as a duty to the congregation.
3. They respond well to stewardship messages (1C).
4. They value harmony between faith and medical guidance (4D).
5. They reject messages that feel individualistic.

A powerful way to understand these different mind-sets is to imagine four families sitting in the same church pew, hearing the same sermon, yet responding to entirely different parts of the message because each family carries a different spiritual lens that shapes how they interpret responsibility, protection, and divine guidance. The "God's Tools" family listens for signs that God works through human hands, and they feel reassured when told that medicine is part of God's provision. The "Community Duty" family listens for messages about service, compassion, and protecting the vulnerable, and they respond most strongly when vaccination is framed as an act of love for the congregation. The "Divine Wisdom" family listens for ideas that connect faith with knowledge, and they respond when vaccination is portrayed as a thoughtful, informed expression of spiritual understanding. The "Faith + Medicine" family listens for harmony, balance, and reassurance, and they respond when told that prayer and medical care work together rather than in conflict. Although these families share the same faith tradition, they differ profoundly in what moves them emotionally and spiritually, and Mind Genomics reveals these differences with clarity, allowing communicators to speak to each group in the language that resonates most deeply. The beauty of this segmentation is that it transforms a seemingly unified audience

into a set of distinct, predictable patterns, each requiring its own respectful, tailored approach.

Table 4 shows AI-developed**,** full segmentation narratives, one for each basic type of mind-set, vivid, concrete, story-driven, and grounded in the coefficients and patterns revealed by the synthetic Mind Genomics study. Each narrative is designed to feel like a living portrait of a real group, making the mind-sets easy to recognize and easy to use in communication.

Table 4 Expanded insights from AI for the four basically different mind-set emerging from the two segmentation efforts

Mind-Set 1 of 2 / Mind-Set 1 of 3
"God's Tools" – The Parents Who Believe God Works Through Human Hands
This mind-set sees the world through a lens where God actively equips people with tools, knowledge, and resources, and where faithful parents show devotion by using those tools wisely and without hesitation. These parents respond strongly to messages that frame vaccines as instruments God places in human hands, and they feel reassured when told that medical knowledge is not a rival to divine power but a direct expression of it. They resonate deeply with statements such as "God calls parents to use every tool He provides" and "Trusting God includes trusting the knowledge He allows humans to discover," because these ideas resolve the tension they feel between faith and science. They are less moved by community-duty messages, not because they reject communal responsibility, but because their primary spiritual focus is on stewardship of the children God entrusted to them. They want to feel that their choices reflect obedience, wisdom, and gratitude for God's gifts, and they reject messages that imply they are testing God or acting irresponsibly. Communicators who speak to this group succeed when they emphasize divine provision, parental stewardship, and the harmony between faith and medical insight, creating a narrative where vaccination becomes an act of faithful partnership with God rather than a concession to worldly pressure.
Mind-Set 2 of 2 / Mind-Set 3 of 3
"Community Duty" – The Parents Who Protect the Congregation First
This mind-set views faith as a communal enterprise where every family's choices ripple outward, shaping the health, safety, and spiritual well-being of the entire congregation. These parents respond most strongly to messages that highlight the moral responsibility to protect newborns, elders, and vulnerable members of the faith community, and they see vaccination as an act of love, service, and solidarity. Statements such as "Loving your neighbor means preventing diseases that could harm them" and "Vaccinating your child protects newborns and elders in your faith community" resonate powerfully because they align with the group's belief that faith is lived through action, not just belief. They are less persuaded by messages about divine tools or scientific wisdom alone, because their primary motivation is relational and communal rather than theological or intellectual. They want to feel that their choices strengthen the church, prevent suffering, and uphold the shared values that bind their community together. Communicators who speak to this group succeed when they emphasize responsibility, compassion, and the protective role parents play in maintaining the health of the congregation, framing vaccination as a visible expression of love and moral leadership.
Mind-Set 1 of 3
"Divine Wisdom" – The Parents Who See God in Knowledge and Understanding
This mind-set is composed of parents who believe that God expresses His presence through wisdom, learning, and the unfolding of human understanding, and they respond strongly to messages that frame vaccines as part of God's intellectual gifts to humanity. They resonate with statements such as "Trusting God includes trusting the knowledge He allows humans to discover" and "Medicine reflects God's gifts of wisdom," because these ideas validate their belief that faith and knowledge are not opposites but partners. They appreciate messages that emphasize learning, discernment, and the pursuit of truth, and they respond well to religious authority figures who affirm the value of vaccination. They are less influenced by community-duty messages, not because they reject communal responsibility, but because their spiritual orientation is inward, reflective, and centered on understanding God's intentions. They want to feel that their decisions are grounded in thoughtful faith, not fear or pressure, and they reject messages that imply conflict between scripture and science. Communicators who speak to this group succeed when they emphasize harmony between faith and knowledge, portraying vaccination as a thoughtful, informed, spiritually aligned choice that reflects the wisdom God encourages believers to seek.
Mind-Set 2 of 3
"Faith + Medicine" – The Parents Who Believe Prayer and Vaccines Work Together
This mind-set consists of parents who see faith and medicine as complementary forces, each essential to the full protection of their children, and they respond most strongly to messages that blend spiritual and practical forms of care. They resonate with statements such as "Prayer and vaccines together form a complete shield of protection" and "Parents can follow God's teachings while also following medical guidance," because these ideas affirm their belief that God works through both spiritual devotion and responsible action. They appreciate gentle, reassuring messages that emphasize harmony rather than conflict, and they respond well to narratives that show faith and medicine cooperating rather than competing. They are moderately influenced by community-duty messages, but their primary motivation is the desire to integrate their spiritual identity with their role as protectors. They want to feel that they are honoring God while also doing everything possible to safeguard their children, and they reject messages that imply they must choose between faith and medical advice. Communicators who speak to this group succeed when they emphasize balance, partnership, and the idea that God blesses both prayer and practical action, creating a narrative where vaccination becomes a natural extension of faithful parenting.

The AI-Mind Genomics Backgrounder can be program to provide additional materials, such as a 'one page mind-set playbook. A one-page mind-set playbook allows the novice medical professional to learn how to speak to each religious vaccine-hesitant mind-set. The playbook gives communicators a fast, actionable guide to the four mind-sets uncovered in the synthetic Mind Genomics study, showing exactly how to speak to each group in the language they already trust, value, and understand. Table 5 shows the playbook. Table 5 shows the assignment system (viewpoint identifier). Both were generated by AI as a standard output.

Table 5 A playbook showing how the medical professional can speak effectively to each vaccine-hesitant mind-set

Mind-Set: "God's Tools"
Core Belief: God provides tools—medicine, knowledge, doctors—and faithful parents use them.
Emotional Trigger: Feeling obedient, wise, and aligned with God's intentions.
Best Messaging Style: Calm, confident, faith-affirming statements that show harmony between divine provision and medical action.
Avoid: Messages implying guilt, fear, or community pressure.
Speak This Way:
"God equips parents with tools to protect their children."
"Using vaccines is an act of faithful stewardship."
"Medical knowledge is one of God's gifts."
Messages for "God's Tools"
"God provides wisdom through doctors, nurses, and the knowledge they use to protect children."
"Using vaccines is a way of honoring the gifts God places in our hands."
"Trusting God includes trusting the discoveries He allows humanity to make."
"Parents show faith by acting wisely, not by ignoring preventable dangers."
Mind-Set: "Community Duty"
Core Belief: Faith is lived through service, protection, and responsibility to the congregation.
Emotional Trigger: Protecting the vulnerable and strengthening the church.
Best Messaging Style: Warm, communal, responsibility-focused messages that emphasize love and care.
Avoid: Intellectual or theological arguments about science.
Speak This Way:
"Vaccinating your child protects newborns and elders in your church."
"Loving your neighbor means preventing harm."
"Healthy families keep the congregation strong."
Messages for "Community Duty"
"Your choice to vaccinate protects the youngest and oldest members of your congregation."
"Loving your neighbor means preventing diseases that could harm them."
"Healthy families keep the church strong and united."
"Vaccination is an act of service that strengthens your entire faith community."
Mind-Set: "Divine Wisdom"
Core Belief: God expresses Himself through knowledge, learning, and human understanding.
Emotional Trigger: Feeling thoughtful, informed, and spiritually aligned with truth.
Best Messaging Style: Messages that connect faith with learning, discernment, and wisdom.
Avoid: Emotional appeals or community-pressure framing.
Speak This Way:
"God gives wisdom through science and discovery."
"Seeking knowledge honors God's teachings."
"Medicine reflects God's gifts of understanding."
Messages for "Divine Wisdom"
"God encourages believers to seek knowledge and avoid ignorance."
"Medical science reflects the wisdom God has woven into creation."
"Understanding how vaccines work is part of honoring God's gift of learning."
"Faith and knowledge grow together when parents make informed decisions."
Mind-Set: "Faith + Medicine"
Core Belief: Prayer and medical care work together as a complete form of protection.
Emotional Trigger: Feeling balanced, reassured, and spiritually supported.
Best Messaging Style: Gentle, integrative messages that show faith and medicine cooperating.
Avoid: Messages that imply choosing between God and doctors.
Speak This Way:
"Prayer and vaccines together form a full shield."
"You can follow God's teachings and medical guidance at the same time."
"Faith and medicine work hand-in-hand.
Messages for "Faith + Medicine"
"Prayer and vaccines together create a complete circle of protection around your child."
"You can follow God's teachings while also following medical guidance."
"Faith and medicine are partners, not competitors."
"God blesses both spiritual devotion and responsible action."

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Assigning a new person to a mind-set

Medical professionals gain real value when they understand the mind-set of a person who refuses vaccines for religious reasons. When doctors know *why* someone feels worried or unsure, they can speak in a kinder, clearer way. Even when the doctor has only a few minutes, this understanding helps them choose the right words, the right tone, and the right examples. Instead of pushing or arguing, the doctor can guide the conversation, so the patient feels respected and safe.

A rapid mind-set identification tool makes this even easier. The tool quietly helps the doctor figure out what type of person they are talking to, without slowing down the visit or changing the patient's experience. It fits smoothly into the normal flow of the office. With this tool, the doctor can quickly see which messages will work best—messages that match the patient's beliefs, feelings, and concerns. The doctor stays in control, uses time wisely, and communicates in a way that feels personal and caring.

An AI-driven backgrounder built on synthesized Mind Genomics results adds even more power. It trains medical professionals to recognize different mind-sets in an efficient, quick manner, almost the way a musician learns to hear patterns in music. The backgrounder shows examples, patterns, and segments, helping the doctor practice how to speak to each type of person. Over time, the doctor becomes skilled at matching the message to the mind-set, creating better conversations, stronger trust, and more effective care. This combination—AI, Mind Genomics, and rapid identification—becomes a practical, everyday tool that supports better communication in the real world of busy medical practice.

To assign a new person to a mind-set, we use a simple four-item rating system in which the individual rates four key elements on a two-point agree/disagree scale, and the pattern of responses determines the closest match to the known mind-set profiles. The four elements used for assignment are:

I. *"God calls parents to use every tool He provides."*

II. *"Prayer and vaccines together form a complete shield."*

III. *"Loving your neighbor means preventing diseases."*

IV. *"Medicine reflects God's gifts of wisdom."*

A person who agrees with items 1 and 4 but not 3 typically belongs to God's Tools or Divine Wisdom; a person who strongly agrees with item 3 belongs to Community Duty or Protect the Church; and a person who agrees with both 2 and 4 belongs to Faith + Medicine. This assignment system is valuable because it allows rapid, low-burden classification of individuals into mind-sets, enabling communicators to tailor messages that match the person's underlying belief structure rather than relying on guesswork or demographic stereotypes. The system also empowers health educators to engage respectfully by speaking in the language that the listener already finds meaningful, increasing the likelihood of trust and understanding.

Discussion

Our backgrounder suggests that reasoning with religiously motivated anti-vaccine parents works best when communication respects belief while presenting clear, simple scientific evidence about vaccine safety. Parents who hesitate for religious reasons often respond when messages acknowledge their values and explain how vaccination protects children from preventable harm, as shown in recent analyses of faith-based vaccine hesitancy. When communicators address these concerns directly, they help parents see vaccination as consistent with their faith rather than opposed to it. This approach works best when messages remain concrete, respectful, and grounded in everyday experience rather than abstract scientific argument.

Mind Genomics strengthens this process by identifying which message elements resonate most strongly with different parent mindsets, allowing tailored communication that feels personal and relevant. AI supports this by rapidly synthesizing evidence and generating message variations that match each segment's needs. Together, these tools create a structured way to speak with parents who worry that vaccines conflict with their religious commitments, helping them see vaccination as an act of protection rather than a violation of belief.

Religiously motivated hesitancy may grow from specific misunderstandings that can be corrected with careful, respectful explanation. Some parents worry about vaccine ingredients or fasting rules, even though many religious authorities have clarified that vaccination is permissible and protective.[18] Other groups express concerns about divine will, believing illness reflects destiny rather than something preventable through medical action.[19] These beliefs require communicators to frame vaccination as a tool that supports parental responsibility rather than challenges religious doctrine. When messages emphasize protection, stewardship, and community safety, parents often shift from resistance to curiosity, opening the door to deeper conversation. Mind Genomics helps identify which framing works best for each subgroup, ensuring that messages feel relevant rather than generic. AI then accelerates the creation of message sets that match these patterns, allowing rapid testing and refinement. This combined approach supports a respectful dialogue that meets parents where they are and guides them toward evidence-based decisions that protect their children.

Trust, clarity, and shared values matter more than argument when speaking with religiously hesitant parents. Studies of religiosity and COVID-19 vaccination demonstrate that trust in institutions strongly predicts willingness to vaccinate, even among highly religious groups.[20] This means that communicators must build trust by showing consistency, honesty, and respect for parental concerns. Mind Genomics helps by identifying which message structures build trust most effectively for each parent segment. AI supports this by generating clear, simple explanations that avoid jargon and focus on practical meaning. When parents feel heard and respected, they become more open to evidence showing that vaccines reduce disease, prevent outbreaks, and protect vulnerable community members. This combination of segmentation and rapid message generation creates a communication strategy that is both humane and scientifically grounded.

While these approaches show promise, it is equally important to recognize the challenges and limitations of AI and Mind Genomics in this context. A primary concern is the lack of diversity in training datasets, which may cause AI-generated messages to overlook specific cultural or theological nuances of minority religious groups. Furthermore, AI lacks true emotional intelligence; while it can simulate tone, it cannot authentically replicate the deep empathy or spiritual sensitivity required for high-stakes religious dialogues. Technical risks such as hallucinations—where the AI generates confident but factually incorrect claims—necessitate strict human oversight to maintain scientific accuracy.

The black box problem also remains a significant hurdle; the opaque nature of AI decision-making can undermine trust among public health officials and skeptical parents alike. Additionally, the risk of jail breaking—where malicious prompts are used to bypass

safety safeguards—could lead to the generation of biased or counter-productive messaging. Mitigating these risks requires a "human-in-the-loop" approach, ensuring that AI-driven frameworks remain transparent, secure, and ethically grounded.

Conclusion

Combining AI and Mind Genomics offers a strong, evidence-based way to engage with religiously motivated anti-vaccine parents. This approach respects the complexity of faith while giving clear, factual explanations that connect vaccine safety with shared values such as responsibility and care for children. By using segmentation, it ensures that communication feels personal and not confrontational. While these benefits are substantial, it is important to remain mindful of the technical limitations that come with AI integration. Challenges such as the need for greater transparency, the risk of hallucinations, and the difficulty of building trust mean that human oversight remains essential. Overall, this framework supports respectful and humane dialogue that helps hesitant families move toward informed decisions, protecting both individual children and the wider community.

Appendix - How Mind Genomics works when people are respondents, rather than in an AI simulation

A Mind Genomics experimental design creates a structured yet highly varied set of 24 short vignettes for each respondent, allowing us to measure how individual ideas influence judgments even when presented in complex combinations, and this structure ensures that each of the 16 elements appears exactly five times and is absent nineteen times, giving the mathematical independence needed for clean regression modeling.

Every respondent receives a unique set of 24 vignettes generated through the patented permutation system described by Gofman and Moskowitz, which guarantees that although the underlying design is identical, the actual combinations differ across individuals, preventing order or pattern bias. Each vignette becomes one row in the database, and each row contains the respondent ID, any self-profiling variables, and 16 binary columns indicating whether each element is present or absent, creating a dataset perfectly suited for ordinary least-squares regression.

The dependent variable is converted into a binary 0/100 score at the time of analysis, which works because the design ensures statistical independence among the elements, allowing absolute coefficients to be estimated without distortion. The result is a set of 16 coefficients per respondent, each representing the additive impact of an idea on the likelihood of a positive response, and these coefficients become the basis for clustering respondents into mind-sets using k-means with distance defined as one minus the Pearson correlation. This process reveals naturally occurring groups of people who respond similarly to specific messages, even when they differ in background, beliefs, or demographics. The design therefore transforms a complex communication challenge into a structured, analyzable system that reveals hidden patterns of persuasion.[16]

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