

Beyond Deficit Narratives: Religious Practice, Meaning, and Resilience in a National Sample of New Zealand Muslims

Joseph A. Bulbulia^{*1}, M. Usman Afzali^{*2}, Aarif Rasheed³, Geoffrey Troughton⁴, Kumar Yogeeswaran⁵, Chris G. Sibley^{*6}

¹ Victoria University of Wellington, New Zealand ORCID  0000-0002-5861-2056

² University of Otago, New Zealand ORCID  0000-0001-5119-9388

³ University of Otago, New Zealand ORCID 

⁴ School of Social and Cultural Studies, Victoria University of Wellington ORCID  0000-0001-7423-0640

⁵ University of Canterbury, New Zealand ORCID  0000-0002-1978-5077

⁶ School of Psychology, University of Auckland, New Zealand ORCID  0000-0002-4064-8800

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Abstract

Religious minorities often endure hostility, yet longitudinal data tracking the consequences of such threats are scarce. We report findings from the Muslim Diversity Study, which samples 667 Muslims embedded within the nationally representative New Zealand Attitudes and Values Study ($n = 31,526$ non-Muslims). Our population-weighted analyses show that New Zealand Muslims exhibit a distinct and devout religious profile. Although no more likely than other New Zealanders to endorse general spirituality (61% vs 63%), New Zealand Muslims report far higher rates of belief in God (91% vs 40%) and dramatically more frequent engagement in costly religious practices, such as worship and prayer. Despite experiencing markedly higher levels of targeted religious and ethnic discrimination, Muslims show few negative disparities in health and social outcomes. Instead, Muslims report significantly greater meaning in life, neighbourhood cohesion, and self-esteem. These findings suggest that the shared rituals and beliefs of this religious minority may foster prosocial capital that buffers against prejudice, providing the foundation for the study's core longitudinal aim: to quantify the pathways by which religious culture fosters resilience.

*These authors contributed equally to this work.

Costly religious practices and beliefs are theorised to build group resilience by stabilising cooperation (Botero *et al.* 2014; Bulbulia 2004; Irons 2001; Schloss and Murray 2011; Shaver *et al.* 2020; Sosis and Bressler 2003). Yet, cohesion theories of religion are seldom tested within minority groups who face the kind of persistent out-group hostility that makes such resilience necessary. Rigorous tests, particularly those with longitudinal data from representative samples, remain scarce.

The 15 March 2019 terrorist attacks on two Christchurch mosques starkly underscored this empirical gap in New Zealand. Existing research documents pervasive prejudice against Muslims (Bulbulia *et al.* 2023; Greaves *et al.* 2020; Shanaah *et al.* 2023; Shaver *et al.* 2016, 2017; Sibley *et al.* 2020); however, limited sampling of this minority has left their sources of resilience largely unobserved.

To address this gap, we launched the Muslim Diversity Study (MDS), a booster cohort embedded within the nationally representative New Zealand Attitudes and Values Study (NZAVS). The design increases Muslim participation nearly ten-fold, enabling the first outcome-wide, population-weighted contrasts of a Muslim minority in a Western democracy (Afzali *et al.* In press, 2025). This article presents the panel's baseline findings, offering a comprehensive snapshot of Muslim life in New Zealand. These data establish the foundation required

to track how communities endure adversity and to quantitatively assess theories of religious solidarity and resilience.

Method

Study design and data sources

The New Zealand Attitudes and Values Study (NZAVS) is an ongoing, address-based probability panel that has tracked the attitudes, values, and health of adult New Zealanders (18+ years old) since 2009. The panel is refreshed with replacement draws from the electoral roll. Annual surveys are administered via mixed modes (postal and secure web). To maintain engagement, the NZAVS employs monetary incentives (NZ \$500 × 10 prizes) and personalised reminders, achieving approximately 70% wave-to-wave retention. The NZAVS is university-based and operates independently of political or corporate funding. It tends to under-sample males and Asian individuals slightly while over-sampling females and Māori (the indigenous people of New Zealand). To improve representativeness, we apply census-based post-stratification weights adjusting for age, gender, and ethnicity (New Zealand European, Asian, Māori, Pacific) ([Sibley 2021](#)). For more information about the NZAVS, visit: [OSF.IO/75SNB](#). Supplement S1 presents descriptive sample statistics.

Participants and eligibility

Participants were eligible if they (i) completed the Wave 15 NZAVS questionnaire and (ii) provided a binary response (0 = no; 1 = yes) to the item “*Do you identify with a religion and/or spiritual group?*”. In total, 32,202 adults met these criteria (non-Muslims = 31,535; Muslims = 667).

Muslim Diversity Study Booster Cohort

Muslims constitute <2% of the New Zealand population and were historically under-represented in the NZAVS by roughly an order of magnitude ([Sibley 2021](#)). To rectify this, we initiated the **Muslim Diversity Study (MDS)** in June–December 2023 as a dedicated booster cohort using the standard NZAVS Wave 15 instrument.

For Wave 15 of the study, we expanded the Muslim sample more than tenfold, from 62 to 667 participants ([Afzali et al. In press, 2025](#)). We achieved this using community-based, respondent-driven sampling, augmented with targeted outreach through mosques, university student associations, and cultural organisations. Recruitment focused on six major urban centres: Auckland, Hamilton, Palmerston North, Wellington, Christchurch, and Dunedin. Eligible participants were New Zealand residents aged 18 or over who self-identified as Muslim.

Outcomes and instruments

We employed an **outcome-wide** framework ([VanderWeele et al. 2020](#)), categorising 39 variables into six domains (religion, discrimination, health, psychological, present-reflective, life-reflective, social). Full item wordings and psychometrics are in Supplement S2: Table 10, Table 11, and Table 12 summarise constructs. Exercise hours were right-skewed and log-transformed before analysis, with predicted means back-transformed for presentation. Details on measures are in S2 refer also to: Sibley ([2021](#)).

Statistical Analysis

We quantified Muslim–non-Muslim differences with survey-weighted generalised linear models (GLMs) fitted to multiply imputed data. Item-level missingness was addressed with group-aware multiple imputation using mice (20 imputations, predictive mean matching). The imputation model included Muslim identity as a fully observed auxiliary variable that predicted all other variables but was never imputed itself, preserving group-specific missing data patterns ([Zhang et al. 2023](#)).

For each completed data set, we built a survey design object containing: (i) calibrated post-stratification weights raked to the 2018 New Zealand census totals and (ii) the analytic variables. We employed a simple survey design

that accounts for post-stratification weighting but does not incorporate clustering or stratification adjustments. Survey design objects were created using `survey::svydesign(ids = ~1, weights = ~adjusted_weights)` for each imputed dataset. Although non-probability recruitment and potential selection bias limit causal inference, post-stratification to 2018 census benchmarks enhances the representativeness of population-level between-group (Muslim vs. non-Muslim) contrasts by adjusting for demographic differences between the sample and target population.

Within each imputed design, we fitted the model:

$$Y = \beta_0 + \beta_1 \text{Muslim} + \beta_2 \text{Age} + \beta_3 \text{Ethnicity} + \beta_4 \text{Gender} + \beta_5 \text{Born in NZ} + \varepsilon$$

using `survey::svyglm()`. Continuous outcomes used the Gaussian family with identity link; binary outcomes used the quasibinomial family with logit link to handle potential overdispersion ([Lumley 2004](#)). Standard errors were derived from model-based linearisation, accounting for weighting.

Population-standardised contrasts

Population-averaged predictions were obtained via:

```
ggeffects::predict_response(
  model    = svyglm_fit,
  terms    = "Muslim",
  margin   = "empirical",
  weights  = weights(svy_design)      # explicit post-stratification weights
)
```

The `margin = "empirical"` invokes `marginalEffects::avg_predictions()`, predicting under both conditions and averaging with survey weights. This yields standardised marginal means for Muslims ($\hat{\mu}_{1m}$) and non-Muslims ($\hat{\mu}_{0m}$) in imputation m . The contrast $\hat{\Delta}_m = \hat{\mu}_{1m} - \hat{\mu}_{0m}$ was pooled across imputations using Rubin's rules (`mitools::MIcombine()`), yielding $\bar{\Delta}$ incorporating sampling and imputation uncertainty ([Rubin 1987](#)).

Control for Multiple Testing

To account for multiple testing across our 39 outcomes, we applied a Bonferroni correction controlling the family-wise error rate at 5%. This yielded a corrected significance threshold of $\alpha_{FWER} = 0.05/39 \approx 0.001$. All confidence intervals were adjusted accordingly using modified critical values, resulting in 99.9% confidence intervals that account for multiple comparisons.

Software and Reproducibility

Analyses used R 4.4.1 ([R Core Team 2025](#)) with `tidyverse` ([Wickham et al. 2019](#)). Key packages: `mice` 3.16 ([Van Buuren 2018](#)), `survey` 4.4-2, `ggeffects` 1.3 ([Ludecke 2018](#)), `marginalEffects` 0.20 ([Arel-Bundock et al. 2024](#)), and `boilerplate` 1.1.3 ([Bulbulia 2025](#)). Reproducible scripts are archived at OSF: <https://osf.io/75snb/files/osfstorage> (folder: 025-muslim-diversity-study-baseline-analysis-study).

Results

Table 1

Muslim vs Non-Muslim Comparative Analysis: Non-Muslim as Reference Group				
Domain	Measure	Non-Muslim	Muslim	Δ from Non-Muslim
Religion	<i>Belief in God (%)</i>	40% [39, 41]	91% [87, 96]***	+51%***
	<i>Belief in Spirit (%)</i>	63% [62, 64]	61% [54, 67]	-3%
	<i>Religious Service/month</i>	0.77 [0.71, 0.83]	5.31 [4.23, 6.39]***	+4.54***
	<i>Religious ID</i>	1.69 [1.64, 1.75]	5.59 [5.34, 5.84]***	+3.89***
	<i>Prayer/week</i>	2.23 [2.05, 2.40]	19.68 [17.65, 21.71]***	+17.45***
	<i>Scripture/week</i>	0.88 [0.80, 0.96]	4.65 [3.36, 5.94]***	+3.77***
	<i>Spiritual ID</i>	3.80 [3.76, 3.85]	5.02 [4.78, 5.25]***	+1.21***
Discrim	<i>Age Ethnic Discrimination</i>	3.21 [3.18, 3.24]	3.29 [3.11, 3.48]	+0.08
	<i>Ethnic Discrimination</i>	2.25 [2.23, 2.28]	2.66 [2.46, 2.85]***	+0.40***
	<i>Gender Discrimination</i>	2.51 [2.48, 2.53]	2.47 [2.30, 2.63]	-0.04
	<i>Religious Discrimination</i>	2.13 [2.10, 2.15]	3.59 [3.41, 3.77]***	+1.46***
Health	<i>Sleep Hours</i>	6.90 [6.88, 6.92]	6.71 [6.57, 6.84]***	-0.19***
	<i>Log Hours Exercise</i>	1.59 [1.57, 1.60]	1.43 [1.33, 1.53]***	-0.16***
	<i>Subjective Health</i>	4.76 [4.74, 4.78]	4.90 [4.79, 5.02]***	+0.15***
Psych	<i>Hlth Fatigue</i>	1.82 [1.80, 1.84]	1.74 [1.63, 1.84]	-0.09
	<i>Anxiety</i>	1.38 [1.36, 1.39]	1.29 [1.21, 1.38]	-0.08
	<i>Depression</i>	0.71 [0.69, 0.72]	0.75 [0.66, 0.84]	+0.05
	<i>Rumination</i>	1.00 [0.98, 1.02]	0.91 [0.80, 1.02]	-0.09
Present	<i>Forgiveness</i>	4.92 [4.89, 4.94]	4.78 [4.64, 4.92]	-0.14
	<i>Perfectionism</i>	3.31 [3.29, 3.34]	3.36 [3.22, 3.49]	+0.04
	<i>Pwb Standard Living</i>	7.16 [7.12, 7.19]	7.02 [6.79, 7.25]	-0.14
	<i>Pwb Your Future Security</i>	5.70 [5.66, 5.74]	5.91 [5.65, 6.16]	+0.21
	<i>Pwb Your Health</i>	6.41 [6.37, 6.45]	6.59 [6.35, 6.83]	+0.18
	<i>Pwb Your Relationships</i>	7.42 [7.39, 7.46]	7.80 [7.57, 8.03]***	+0.37***
	<i>Self Esteem</i>	5.05 [5.03, 5.07]	5.48 [5.36, 5.60]***	+0.43***
Life	<i>Gratitude</i>	5.85 [5.83, 5.87]	5.98 [5.89, 6.08]***	+0.13***
	<i>Life Satisfaction</i>	4.98 [4.96, 5.00]	5.24 [5.12, 5.36]***	+0.26***
	<i>Meaning & Purpose</i>	4.94 [4.91, 4.96]	5.80 [5.65, 5.94]***	+0.86***
	<i>Meaning Sense</i>	5.57 [5.55, 5.59]	6.01 [5.89, 6.14]***	+0.44***

Muslim vs Non-Muslim Comparative Analysis: Non-Muslim as Reference Group

Domain	Measure	Non-Muslim	Muslim	Δ from Non-Muslim
Social	<i>Belong Accept</i>	5.53 [5.51, 5.56]	5.58 [5.44, 5.71]	+0.04
	<i>Belong Beliefs</i>	4.72 [4.70, 4.74]	4.68 [4.53, 4.84]	-0.03
	<i>Belong Routside Reversed</i>	4.84 [4.81, 4.87]	4.92 [4.73, 5.10]	+0.08
	<i>Neighbourhood Community</i>	4.28 [4.25, 4.30]	4.79 [4.61, 4.97]***	+0.51***
	<i>Support</i>	5.86 [5.84, 5.88]	5.71 [5.58, 5.84]***	-0.15***

Values show estimates with 95% confidence intervals [lower, upper]. Δ = difference from Non-Muslim.

Estimates from 20 multiply imputed datasets using Rubin's rule with design-based survey weights.

Statistical significance: *** = confidence intervals do not overlap ($p < 0.01$), * = confidence intervals do not overlap with reference point estimate ($p < 0.05$).

Colour coding: Red (***) = highly reliable difference, Orange (*) = reliable difference, Black = no reliable difference detected.

Adjusted population comparisons of Muslims and Non-Muslims in New Zealand

Adjusted population comparisons between Muslims and non-Muslims are summarised in Table 1; see also data visualisations in S3. Three main findings emerge from these comparisons.

1. Profound Religious Differences

Muslims exhibit vastly higher religious belief and practice. Belief in God is more than double that of non-Muslims (91% vs. 40%). Behavioural measures reveal even starker gaps: Muslims attend services nearly seven times more often (5.31 vs. 0.77/month) and pray almost nine times more frequently (19.68 vs. 2.23/week). Religious self-identification is higher by 3.89 points on a 7-point scale.

2. Elevated Religious and Ethnic Discrimination

Muslims report considerably higher discrimination. The largest difference across all outcomes was for religious discrimination (+1.46 points). Ethnic discrimination was also elevated (+0.40). No reliable differences emerged for age or gender-based discrimination, revealing the targeted nature of prejudice against Muslims.

3. Psychological and Social Resources

Despite discrimination, Muslims show a positive well-being profile. No evidence of heightened distress; anxiety, depression, rumination, and fatigue levels are indistinguishable from non-Muslims. Moreover, Muslims report higher subjective health (+0.15), self-esteem (+0.43), and life satisfaction (+0.26).

Resilience extends to existential and social domains. The largest positive differences were in perceived sense of purpose and meaning (+0.86 for Meaning: Purpose, +0.44 for Meaning: Sense). Muslims also show higher gratitude (+0.13) and perceived neighbourhood community (+0.51). The only vulnerability was slightly lower generalised social support (-0.15), contrasting with strong local connections.

Discussion

The baseline Muslim Diversity Study data reveal a striking paradox: New Zealand's Muslim minority is highly devout and disproportionately targeted by prejudice, yet reports equivalent or superior well-being across diverse outcomes. This finding squarely challenges common deficit-based narratives of minority experience (Paradies 2006; Pascoe and Smart Richman 2009). Although this pattern is consistent with "rejection-identification" models, which propose that experiences of discrimination can enhance minority group identification and thereby buffer well-being (reviewed in Schmitt *et al.* (2014)), these frameworks are merely descriptive; they do not explain why group identification should be protective. We propose that evolutionary theories of religion provide this missing explanatory logic by specifying how religious commitment and practice cultivate resilience under adversity. Two non-exclusive pathways merit longitudinal investigation.

The Social-Buffer Pathway

Costly commitment theories suggest religion enhances in-group cooperation and trust (Sosis and Alcorta 2003). These theories posit that religion acts as a credible signal of commitment by requiring observable investments in rituals and practices, deterring free-riders and fostering reciprocal support within the group. Our data align with this proposition, showing that strong religiosity corresponds with dense neighbourhood ties (+0.51), which may mitigate the stress of discrimination (Helliwell and Putnam 2004). The concurrent finding of lower generalised social support (-0.15) further hints that these support networks may be faith-specific, a classic hallmark of religious cooperation that future panel waves are poised to investigate (Putnam 2000).

The Meaning-Buffer Pathway

Faith also provides cognitive resources to reframe adversity, foster purpose, and safeguard self-worth (Park 2010; VanderWeele 2017). Through meaning-making processes, individuals can reinterpret discriminatory experiences in light of a broader sacred narrative, and as opportunities for spiritual growth, thereby preserving a coherent sense of purpose even when secular validation is lacking. The large positive effects for purpose-in-life (+0.86) and self-esteem (+0.43) strongly endorse this pathway. For many Muslims, faith may supply a resilient worldview less contingent on secular norms, another hypothesis that future panel waves may investigate.

Strengths and Limitations

The study's strengths include its large booster sample integrated within a national probability panel, the use of census-weighted estimates, and robust imputation for missing data. These features enhance the scale and statistical reliability of our findings.

The study also has several limitations. Our reliance on English-language self-reports may introduce coverage bias, and the non-probabilistic sampling of the booster cohort affects generalisability. The most significant constraint is the cross-sectional design, which precludes causal inferences. Although future panel waves will help identify causal relationships, we cannot fully account for unmeasured confounding, a fundamental constraint of observational research that sensitivity analyses can only partially mitigate (Bulbulia 2024b).

Implications

Methodologically, our study demonstrates how targeted oversampling within an established panel can effectively illuminate the lives of small minority groups, a model detailed in Afzali *et al.* (*In press*, 2025). For policy, the findings challenge a focus on community deficits. Because our data show that prejudice is highly specific, targeting religion and ethnicity but not other identities like age or gender, interventions must also be specific, targeting Islamophobia and racism directly rather than prejudice in general. Furthermore, given that the community reports robust well-being despite this targeted hostility, an effective policy approach would amplify existing community assets. Our data suggest these assets include the religious practices and networks that correlate with

high neighbourhood cohesion. Supporting community-led programmes that leverage these strengths may be a powerful lever for bolstering well-being from within.

Overall, the inaugural wave of the Muslim Diversity Study paints a portrait of a community that, although confronting targeted prejudice, is not defined by deficit. Instead, Muslims in New Zealand exhibit a constellation of strengths, including deep doctrinal faith, a strong sense of meaning, robust self-esteem, and tightly-knit local ties, that appear to offset external stressors. Disentangling how these cooperation-building assets translate experiences of discrimination into flourishing is now the central agenda for the study's longitudinal phase.

Crucially, the mechanisms we aim to unpack are not uniquely Muslim. Religious rituals and beliefs that demand costly commitment, and the meaning systems that sustain them, are human universals shaped by cultural evolution to promote cooperation ([Alcorta 2011](#); [Alcorta and Sosis 2005](#); [Norenzayan et al. 2016](#); [Park et al. 2005](#)). In this sense, former New Zealand Prime Minister Jacinda Ardern's declaration, "They are us" ([Ardern 2019](#)), can be read as more than a gesture of solidarity. It is an analytical proposition: by understanding the pathways that sustain Muslim resilience, we may uncover resources capable of enhancing well-being across the entire social fabric. These preliminary results turn the tables on conventional minority-stress narratives, inviting scholars and policy-makers to learn from, rather than only about, one of the nation's most stigmatised groups.

Ethics

The University of Auckland Human Participants Ethics Committee reviews the NZAVS every three years. Our most recent ethics approval statement is as follows: The New Zealand Attitudes and Values Study was approved by the University of Auckland Human Participants Ethics Committee on 26/05/2021 for six years until 26/05/2027, Reference Number UAHPEC22576.

Data Availability

The data described in the paper are part of the New Zealand Attitudes and Values Study. Members of the NZAVS management team and research group hold full copies of the NZAVS data. A de-identified dataset containing only the variables analysed in this manuscript is available upon request from the corresponding author or any member of the NZAVS advisory board for replication or checking of any published study using NZAVS data. The code for the analysis using simulated data can be found at: https://osf.io/75snb/files/osfstorage#: folder: Supplementary Materials for Review/2025-muslim-diversity-study-baseline-analysis-study.

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Author Statement

TBD: JB prepared the models, tables and graphs and wrote the first draft. UA led the MDS and community outreach. CGS led the New Zealand Attitudes and Values Study data collection. All authors contributed to the writing of this manuscript.

Supplement 1: Sample Descriptive Statistics

Table 2: Sample demographic statistics for New Zealand Attitudes and Values Study/ Muslim Diversity Study (MDS) Cohort in the MDS baseline wave (NZAVS time 15, spanning years 2022-2023).

	Not Muslim	Muslim
	(N=31526)	(N=667)
Age		
Mean (SD)	53.2 (16.6)	34.2 (13.0)
Median [Min, Max]	57.0 [18.0, 99.0]	31.5 [18.0, 84.0]
Missing	1 (0.0%)	21 (3.1%)
Agreeableness (Personality Trait)		
Mean (SD)	5.34 (1.02)	5.30 (1.05)
Median [Min, Max]	5.50 [1.00, 7.00]	5.50 [1.00, 7.00]
Missing	80 (0.3%)	3 (0.4%)
Weekly Alcohol Consumption		
Mean (SD)	1.54 (1.60)	0.0465 (0.270)
Median [Min, Max]	1.00 [0, 4.50]	0 [0, 2.50]
Missing	824 (2.6%)	27 (4.0%)
Intensity of Alcohol Consumption		
Mean (SD)	1.98 (2.17)	0.176 (1.03)
Median [Min, Max]	2.00 [0, 48.0]	0 [0, 15.0]
Missing	1732 (5.5%)	26 (3.9%)
Sense of Belonging		
Mean (SD)	5.14 (1.14)	4.82 (1.21)
Median [Min, Max]	5.33 [1.00, 7.00]	5.00 [1.00, 7.00]
Missing	163 (0.5%)	3 (0.4%)
Born in New Zealand (Yes/No)		
Mean (SD)	0.789 (0.408)	0.237 (0.425)
Median [Min, Max]	1.00 [0, 1.00]	0 [0, 1.00]
Missing	42 (0.1%)	37 (5.5%)
Charitable Donations		
Mean (SD)	1170 (8380)	862 (2370)
Median [Min, Max]	150 [0, 1000000]	100 [0, 35000]
Missing	536 (1.7%)	13 (1.9%)

	Not Muslim	Muslim
Number of Children		
Mean (SD)	1.69 (1.55)	1.21 (1.58)
Median [Min, Max]	2.00 [0, 43.0]	0 [0, 8.00]
Missing	25 (0.1%)	29 (4.3%)
Conscientiousness (Personality Trait)		
Mean (SD)	5.05 (1.09)	5.02 (1.07)
Median [Min, Max]	5.25 [1.00, 7.00]	5.00 [1.75, 7.00]
Missing	103 (0.3%)	3 (0.4%)
Education Level		
no_qualification	466 (1.5%)	26 (3.9%)
cert_1_to_4	8730 (27.7%)	103 (15.4%)
cert_5_to_6	4117 (13.1%)	33 (4.9%)
university	8685 (27.5%)	228 (34.2%)
post_grad	4488 (14.2%)	40 (6.0%)
masters	3599 (11.4%)	117 (17.5%)
doctorate	1189 (3.8%)	57 (8.5%)
Missing	252 (0.8%)	63 (9.4%)
Employment Status (Employed/Unemployed)		
Mean (SD)	0.703 (0.457)	0.707 (0.456)
Median [Min, Max]	1.00 [0, 1.00]	1.00 [0, 1.00]
Missing	310 (1.0%)	5 (0.7%)
Ethnicity Category		
euro	25733 (81.6%)	62 (9.3%)
maori	3469 (11.0%)	13 (1.9%)
pacific	669 (2.1%)	25 (3.7%)
asian	1340 (4.3%)	400 (60.0%)
Missing	315 (1.0%)	167 (25.0%)
Extraversion (Personality Trait)		
Mean (SD)	3.76 (1.25)	3.90 (1.25)
Median [Min, Max]	3.75 [1.00, 7.00]	4.00 [1.00, 7.00]
Missing	90 (0.3%)	3 (0.4%)
Health Disability Status (Yes/No)		
Mean (SD)	0.337 (0.473)	0.155 (0.362)

	Not Muslim	Muslim
Median [Min, Max]	0 [0, 1.00]	0 [0, 1.00]
Missing	292 (0.9%)	1 (0.2%)
Honesty-Humility (Personality Trait)		
Mean (SD)	5.65 (1.15)	4.88 (1.36)
Median [Min, Max]	6.00 [1.00, 7.00]	5.00 [1.00, 7.00]
Missing	62 (0.2%)	2 (0.3%)
Hours Spent with Children per Week		
Mean (SD)	9.25 (26.3)	14.5 (33.5)
Median [Min, Max]	0 [0, 168]	0 [0, 168]
Missing	801 (2.5%)	81 (12.1%)
Hours Spent on Charity per Week		
Mean (SD)	1.60 (4.61)	1.63 (3.44)
Median [Min, Max]	0 [0, 100]	0 [0, 25.0]
Missing	790 (2.5%)	80 (12.0%)
Commute Hours per Week		
Mean (SD)	4.64 (6.42)	5.60 (8.18)
Median [Min, Max]	3.00 [0, 160]	3.00 [0, 100]
Missing	794 (2.5%)	80 (12.0%)
Hours Exercising per Week		
Mean (SD)	6.32 (7.32)	4.23 (5.39)
Median [Min, Max]	5.00 [0, 80.0]	3.00 [0, 50.0]
Missing	797 (2.5%)	80 (12.0%)
Hours of Housework per Week		
Mean (SD)	10.6 (8.97)	10.5 (13.5)
Median [Min, Max]	10.0 [0, 168]	7.00 [0, 168]
Missing	795 (2.5%)	80 (12.0%)
Hours Working per Week		
Mean (SD)	22.8 (20.1)	21.6 (20.3)
Median [Min, Max]	25.0 [0, 100]	20.0 [0, 100]
Missing	770 (2.4%)	80 (12.0%)
Household Income		
Mean (SD)	131000 (121000)	109000 (120000)
Median [Min, Max]	100000 [0, 5000000]	90000 [0, 2000000]

	Not Muslim	Muslim
Missing	1827 (5.8%)	225 (33.7%)
Left-Wing Authoritarianism		
Mean (SD)	2.40 (1.13)	2.95 (1.11)
Median [Min, Max]	2.20 [1.00, 7.00]	2.80 [1.00, 7.00]
Missing	95 (0.3%)	4 (0.6%)
Male (Yes/No)		
Mean (SD)	0.366 (0.482)	0.389 (0.488)
Median [Min, Max]	0 [0, 1.00]	0 [0, 1.00]
Missing	333 (1.1%)	1 (0.2%)
Muslim (Yes/No)		
Not Muslim	31526 (100%)	0 (0%)
Muslim	0 (0%)	667 (100%)
Neuroticism (Personality Trait)		
Mean (SD)	3.44 (1.21)	3.79 (1.07)
Median [Min, Max]	3.50 [1.00, 7.00]	3.75 [1.00, 7.00]
Missing	82 (0.3%)	3 (0.4%)
Non-Heterosexual Orientation (Yes/No)		
Mean (SD)	0.116 (0.320)	0.0368 (0.189)
Median [Min, Max]	0 [0, 1.00]	0 [0, 1.00]
Missing	366 (1.2%)	124 (18.6%)
New Zealand Depression Index 2018		
Mean (SD)	4.73 (2.74)	5.63 (2.85)
Median [Min, Max]	4.00 [1.00, 10.0]	6.00 [1.00, 10.0]
Missing	565 (1.8%)	51 (7.6%)
New Zealand Socio-Economic Index 2018 (Level)		
Mean (SD)	55.3 (15.7)	55.0 (16.7)
Median [Min, Max]	59.0 [10.0, 90.0]	60.0 [11.0, 90.0]
Missing	355 (1.1%)	44 (6.6%)
Openness (Personality Trait)		
Mean (SD)	5.04 (1.16)	4.97 (1.10)
Median [Min, Max]	5.00 [1.00, 7.00]	5.00 [1.25, 7.00]
Missing	97 (0.3%)	2 (0.3%)
Parental Status (Yes/No)		

	Not Muslim	Muslim
Mean (SD)	0.688 (0.463)	0.462 (0.499)
Median [Min, Max]	1.00 [0, 1.00]	0 [0, 1.00]
Missing	25 (0.1%)	29 (4.3%)
Partnership Status (Yes/No)		
Mean (SD)	0.704 (0.456)	0.557 (0.497)
Median [Min, Max]	1.00 [0, 1.00]	1.00 [0, 1.00]
Missing	439 (1.4%)	12 (1.8%)
Political Conservatism Level		
Mean (SD)	3.47 (1.43)	4.02 (1.34)
Median [Min, Max]	4.00 [1.00, 7.00]	4.00 [1.00, 7.00]
Missing	1158 (3.7%)	85 (12.7%)
Rurality Classification (GCH 2018 Level)		
Mean (SD)	1.67 (0.984)	1.16 (0.421)
Median [Min, Max]	1.00 [1.00, 5.00]	1.00 [1.00, 4.00]
Missing	563 (1.8%)	51 (7.6%)
Right-Wing Authoritarianism		
Mean (SD)	3.21 (1.10)	4.51 (1.07)
Median [Min, Max]	3.17 [1.00, 7.00]	4.50 [1.00, 7.00]
Missing	50 (0.2%)	4 (0.6%)
Social Dominance Orientation		
Mean (SD)	2.23 (0.974)	2.44 (0.899)
Median [Min, Max]	2.17 [1.00, 7.00]	2.33 [1.00, 5.33]
Missing	15 (0.0%)	0 (0%)

Table 3: Sample statistics for perceived discrimination: New Zealand Attitudes and Values Study/ Muslim Diversity Study (MDS) Cohort in the MDS baseline wave (NZAVS time 15, spanning years 2022-2023).

	Not Muslim	Muslim
	(N=31526)	(N=667)
Perceived Age Discrimination		
Mean (SD)	3.31 (1.80)	2.96 (1.81)
Median [Min, Max]	3.00 [1.00, 7.00]	3.00 [1.00, 7.00]
Missing	1830 (5.8%)	18 (2.7%)
Perceived Ethnic Discrimination		
Mean (SD)	1.94 (1.50)	3.38 (1.90)
Median [Min, Max]	1.00 [1.00, 7.00]	3.00 [1.00, 7.00]
Missing	1724 (5.5%)	7 (1.0%)
Perceived Gender Discrimination		
Mean (SD)	2.57 (1.68)	2.54 (1.78)
Median [Min, Max]	2.00 [1.00, 7.00]	2.00 [1.00, 7.00]
Missing	1693 (5.4%)	10 (1.5%)
Perceived Religious Discrimination		
Mean (SD)	1.99 (1.43)	3.90 (1.85)
Median [Min, Max]	1.00 [1.00, 7.00]	4.00 [1.00, 7.00]
Missing	2352 (7.5%)	12 (1.8%)

Table 4: Sample statistics for religion and spirituality: New Zealand Attitudes and Values Study/ Muslim Diversity Study (MDS) Cohort in the MDS baseline wave (NZAVS time 15, spanning years 2022-2023).

	Not Muslim	Muslim
	(N=31526)	(N=667)
Belief in God		
Mean (SD)	0.376 (0.484)	0.950 (0.218)
Median [Min, Max]	0 [0, 1.00]	1.00 [0, 1.00]
Missing	392 (1.2%)	4 (0.6%)
Belief in Spirit		
Mean (SD)	0.639 (0.480)	0.649 (0.478)
Median [Min, Max]	1.00 [0, 1.00]	1.00 [0, 1.00]
Missing	392 (1.2%)	4 (0.6%)
Monthly Religious Service Attendance		
Mean (SD)	0.632 (2.33)	5.13 (8.47)
Median [Min, Max]	0 [0, 30.0]	1.00 [0, 30.0]
Missing	0 (0%)	8 (1.2%)
Religious Identification Level		
Mean (SD)	1.53 (2.55)	6.44 (1.15)
Median [Min, Max]	0 [0, 7.00]	7.00 [1.00, 7.00]
Missing	569 (1.8%)	73 (10.9%)
Weekly Prayer		
Mean (SD)	1.98 (7.28)	20.6 (17.7)
Median [Min, Max]	0 [0, 100]	21.0 [0, 100]
Missing	0 (0%)	8 (1.2%)
Weekly Scripture		
Mean (SD)	0.754 (2.94)	5.07 (10.8)
Median [Min, Max]	0 [0, 100]	2.00 [0, 100]
Missing	0 (0%)	8 (1.2%)
Spiritual Identification Level		
Mean (SD)	3.81 (2.11)	5.28 (1.76)
Median [Min, Max]	4.00 [1.00, 7.00]	6.00 [1.00, 7.00]
Missing	2248 (7.1%)	20 (3.0%)

Table 5: Sample statistics for self-reported health: New Zealand Attitudes and Values Study/ Muslim Diversity Study (MDS) Cohort in the MDS baseline wave (NZAVS time 15, spanning years 2022-2023).

	Not Muslim (N=31526)	Muslim (N=667)
Sleep		
Mean (SD)	6.94 (1.14)	6.67 (1.25)
Median [Min, Max]	7.00 [2.00, 16.0]	7.00 [2.00, 15.0]
Missing	1524 (4.8%)	126 (18.9%)
Hours of Exercise (log)		
Mean (SD)	1.65 (0.838)	1.27 (0.890)
Median [Min, Max]	1.79 [0, 4.39]	1.39 [0, 3.93]
Missing	797 (2.5%)	80 (12.0%)
Short Form Health		
Mean (SD)	4.78 (1.20)	4.98 (1.18)
Median [Min, Max]	5.00 [1.00, 7.00]	5.00 [1.33, 7.00]
Missing	109 (0.3%)	0 (0%)

Table 6: Sample statistics for psychological well-being: New Zealand Attitudes and Values Study/ Muslim Diversity Study (MDS) Cohort in the MDS baseline wave (NZAVS time 15, spanning years 2022-2023).

	Not Muslim	Muslim
	(N=31526)	(N=667)
Fatigue		
Mean (SD)	1.73 (1.11)	2.02 (1.14)
Median [Min, Max]	2.00 [0, 4.00]	2.00 [0, 4.00]
Missing	158 (0.5%)	7 (1.0%)
Anxiety		
Mean (SD)	1.27 (0.825)	1.58 (0.933)
Median [Min, Max]	1.33 [0, 4.00]	1.67 [0, 4.00]
Missing	64 (0.2%)	4 (0.6%)
Depression		
Mean (SD)	0.608 (0.784)	0.978 (0.907)
Median [Min, Max]	0.333 [0, 4.00]	0.667 [0, 4.00]
Missing	61 (0.2%)	4 (0.6%)
Rumination		
Mean (SD)	0.874 (1.03)	1.23 (1.15)
Median [Min, Max]	1.00 [0, 4.00]	1.00 [0, 4.00]
Missing	147 (0.5%)	5 (0.7%)

Table 7: Sample statistics for psychological person-focused well-being: New Zealand Attitudes and Values Study/Muslim Diversity Study (MDS) Cohort in the MDS baseline wave (NZAVS time 15, spanning years 2022-2023).

	Not Muslim	Muslim
	(N=31526)	(N=667)
Forgiveness		
Mean (SD)	5.08 (1.32)	4.45 (1.47)
Median [Min, Max]	5.33 [1.00, 7.00]	4.67 [1.00, 7.00]
Missing	179 (0.6%)	0 (0%)
Perfectionism		
Mean (SD)	3.13 (1.44)	3.72 (1.39)
Median [Min, Max]	3.00 [1.00, 7.00]	3.67 [1.00, 7.00]
Missing	218 (0.7%)	4 (0.6%)
PWB Standard Living		
Mean (SD)	7.38 (2.19)	6.66 (2.39)
Median [Min, Max]	8.00 [0, 10.0]	7.00 [0, 10.0]
Missing	147 (0.5%)	6 (0.9%)
PWB Your Future Security		
Mean (SD)	5.90 (2.59)	5.54 (2.65)
Median [Min, Max]	6.00 [0, 10.0]	5.00 [0, 10.0]
Missing	184 (0.6%)	14 (2.1%)
PWB Your Health		
Mean (SD)	6.44 (2.48)	6.86 (2.38)
Median [Min, Max]	7.00 [0, 10.0]	7.00 [0, 10.0]
Missing	266 (0.8%)	6 (0.9%)
PWB Your Relationships		
Mean (SD)	7.59 (2.26)	7.40 (2.41)
Median [Min, Max]	8.00 [0, 10.0]	8.00 [0, 10.0]
Missing	190 (0.6%)	11 (1.6%)
Self Esteem		
Mean (SD)	5.14 (1.36)	5.29 (1.31)
Median [Min, Max]	5.33 [1.00, 7.00]	5.33 [1.00, 7.00]
Missing	162 (0.5%)	2 (0.3%)

Table 8: Sample statistics for psychological life-focussed well-being: New Zealand Attitudes and Values Study/Muslim Diversity Study (MDS) Cohort in the MDS baseline wave (NZAVS time 15, spanning years 2022-2023).

	Not Muslim	Muslim
	(N=31526)	(N=667)
Gratitude		
Mean (SD)	5.89 (0.928)	6.03 (0.933)
Median [Min, Max]	6.00 [1.00, 7.00]	6.33 [2.67, 7.00]
Missing	161 (0.5%)	2 (0.3%)
Life Satisfaction		
Mean (SD)	5.12 (1.29)	4.99 (1.28)
Median [Min, Max]	5.50 [1.00, 7.00]	5.00 [1.00, 7.00]
Missing	552 (1.8%)	2 (0.3%)
Meaning-Purpose		
Mean (SD)	5.05 (1.50)	5.65 (1.43)
Median [Min, Max]	5.00 [1.00, 7.00]	6.00 [1.00, 7.00]
Missing	2265 (7.2%)	25 (3.7%)
Meaning-Sense		
Mean (SD)	5.71 (1.27)	5.80 (1.33)
Median [Min, Max]	6.00 [1.00, 7.00]	6.00 [1.00, 7.00]
Missing	1766 (5.6%)	11 (1.6%)

Table 9: Sample statistics for psychological social well-being: New Zealand Attitudes and Values Study/ Muslim Diversity Study (MDS) Cohort in the MDS baseline wave (NZAVS time 15, spanning years 2022-2023).

	Not Muslim	Muslim
	(N=31526)	(N=667)
Belonging - Acceptance		
Mean (SD)	5.60 (1.30)	5.48 (1.38)
Median [Min, Max]	6.00 [1.00, 7.00]	6.00 [1.00, 7.00]
Missing	1695 (5.4%)	11 (1.6%)
Belonging - Shared Beliefs		
Mean (SD)	4.79 (1.32)	4.56 (1.57)
Median [Min, Max]	5.00 [1.00, 7.00]	5.00 [1.00, 7.00]
Missing	1659 (5.3%)	15 (2.2%)
Belonging - Outsider (Reversed)		
Mean (SD)	5.03 (1.77)	4.44 (1.89)
Median [Min, Max]	6.00 [1.00, 7.00]	4.00 [1.00, 7.00]
Missing	1717 (5.4%)	11 (1.6%)
Neighbourhood Community		
Mean (SD)	4.49 (1.63)	4.16 (1.84)
Median [Min, Max]	5.00 [1.00, 7.00]	4.00 [1.00, 7.00]
Missing	1643 (5.2%)	16 (2.4%)
Social Support		
Mean (SD)	5.95 (1.17)	5.55 (1.34)
Median [Min, Max]	6.33 [1.00, 7.00]	5.67 [1.00, 7.00]
Missing	192 (0.6%)	1 (0.2%)

Supplement 2: Measures

Demographic Variables

Age

We asked participants' ages in an open-ended question ("What is your age?" or "What is your date of birth") ([Sibley 2021](#)).

Items:

- What is your date of birth?

Agreeableness

Mini-IPIP6 Agreeableness dimension: (i) I sympathize with others' feelings. (ii) I am not interested in other people's problems. (r) (iii) I feel others' emotions. (iv) I am not really interested in others. (r) ([Sibley et al. 2011](#)).

Items:

- I sympathize with others' feelings.
- I am not interested in other people's problems.
- I feel others' emotions.
- I am not really interested in others (reversed).

Alcohol Frequency Weekly

No information available for this variable.

Alcohol Intensity

Participants responded using an open-ended box ([Health 2013](#)).

Items:

- "How many drinks containing alcohol do you have on a typical day when drinking alcohol? (number of drinks on a typical day when drinking)"

Belong

We assessed felt belongingness with three items adapted from the Sense of Belonging Instrument (Hagerty & Patusky, 1995): (1) "Know that people in my life accept and value me"; (2) "Feel like an outsider"; (3) "Know that people around me share my attitudes and beliefs". Participants responded on a scale from 1 (Very Inaccurate) to 7 (Very Accurate). The second item was reversely coded ([Hagerty and Patusky 1995](#)).

Items:

- Know that people in my life accept and value me.
- Feel like an outsider (reversed).
- Know that people around me share my attitudes and beliefs.

Born Nz Binary

Coded binary (1 = New Zealand; 0 = elsewhere.) ([Sibley 2021](#)).

Items:

- Where were you born? (please be specific, e.g., which town/city?)

Charity Donate

Numerical: open-ended response ([Hoverd and Sibley 2010](#)).

Items:

- How much money have you donated to charity in the last year?

Children Num

We measured the number of children using one item from Bulbulia et al. (2015). We asked participants, “How many children have you given birth to, fathered, or adopted?” or “How many children have you given birth to, fathered, and/or parented?” (waves: 12-15) ([Bulbulia et al. 2015](#)).

Conscientiousness

Mini-IPIP6 Conscientiousness dimension: (i) I get chores done right away. (ii) I like order. (iii) I make a mess of things. (r) (iv) I often forget to put things back in their proper place. (r) ([Sibley et al. 2011](#)).

Items:

- I get chores done right away.
- I like order.
- I make a mess of things.
- I often forget to put things back in their proper place.

Education Level Coarsen

We asked participants, “What is your highest level of qualification?”. We coded participants highest finished degree according to the New Zealand Qualifications Authority. Ordinal-Rank 0-10 NZREG codes (with overseas school qualifications coded as Level 3, and all other ancillary categories coded as missing) ([Sibley 2021](#)).

Items:

- What is your highest level of qualification?

Employed Binary

Binary response: (0 = No, 1 = Yes) ([Statistics New Zealand 2017](#)).

Items:

- Are you currently employed (This includes self-employed or casual work)?

Eth Cat

Coded string: (1 = New Zealand European; 2 = Māori; 3 = Pacific; 4 = Asian) ([Statistics New Zealand 2017](#)).

Items:

- Which ethnic group(s) do you belong to?

Extraversion

Mini-IPIP6 Extraversion dimension: (i) I am the life of the party. (ii) I don't talk a lot. (r) (iii) I keep in the background. (r) (iv) I talk to a lot of different people at parties ([Sibley et al. 2011](#)).

Items:

- I am the life of the party.
- I don't talk a lot (reversed).
- I keep in the background (reversed).
- I talk to a lot of different people at parties.

Hlth Disability Binary

We assessed disability with a one-item indicator adapted from Verbrugge (1997). It asks, "Do you have a health condition or disability that limits you and that has lasted for 6+ months?" (1 = Yes, 0 = No) ([Verbrugge 1997](#)).

Items:

- Do you have a health condition or disability that limits you and that has lasted for 6+ months?

Honesty Humility

Mini-IPIP6 Honesty-Humility dimension: (i) I feel entitled to more of everything. (r) (ii) I deserve more things in life. (r) (iii) I would like to be seen driving around in a very expensive car. (r) (iv) I would get a lot of pleasure from owning expensive luxury goods. (r) ([Sibley et al. 2011](#)).

Items:

- I feel entitled to more of everything (reversed).
- I deserve more things in life (reversed).
- I deserve more things in life (reversed).
- I would get a lot of pleasure from owning expensive luxury goods (reversed).

Hours Children

Numerical: open-ended response ([Sibley 2021](#)).

Items:

- Hours spent ... looking after children

Hours Charity

Numerical: open-ended response ([Sibley et al. 2011](#)).

Items:

- Hours spent ... voluntary/charitable work.

Hours Commute

([Sibley 2021](#)).

Items:

- Hours spent...travelling/commuting.

Hours Exercise

No information available for this variable.

Hours Housework

No information available for this variable.

Hours Work

No information available for this variable.

Household Inc

- Please estimate your total household income (before tax) for the year XXXX.

Lwa

No information available for this variable.

Male Binary

Here, we coded all those who responded as Male as 1, and those who did not as 0 ([Fraser et al. 2020](#)).

Items:

- We asked participants' gender in an open-ended question: "what is your gender?"

Neuroticism

Mini-IPIP6 Neuroticism dimension: (i) I have frequent mood swings. (ii) I am relaxed most of the time. (r) (iii) I get upset easily. (iv) I seldom feel blue. (r) ([Sibley et al. 2011](#)).

Items:

- I have frequent mood swings.
- I am relaxed most of the time (reversed).
- I get upset easily.
- I seldom feel blue (reversed).

Not Heterosexual Binary

Open-ended question, coded as binary (not heterosexual = 1) ([Greaves et al. 2017](#)).

Items:

- How would you describe your sexual orientation? (e.g., heterosexual, homosexual, straight, gay, lesbian, bisexual, etc.)

Nz Dep2018

Numerical: (1-10) ([Atkinson et al. 2019](#)).

Items:

- New Zealand Deprivation - Decile Index - Using 2018 Census Data

Nzsei 13 1

This index uses the income, age, and education of a reference group, in this case, the 2013 New Zealand census, to calculate a score for each occupational group. Scores range from 10 (Lowest) to 90 (Highest). This list of index scores for occupational groups was used to assign each participant a NZSEI-13 score based on their occupation ([Fahy et al. 2017](#)).

Items:

- We assessed occupational prestige and status using the New Zealand Socio-economic Index 13 (NZSEI-13).

Openness

Mini-IPIP6 Openness to Experience dimension: (i) I have a vivid imagination. (ii) I have difficulty understanding abstract ideas. (r) (iii) I do not have a good imagination. (r) (iv) I am not interested in abstract ideas. (r) ([Sibley et al. 2011](#)).

Items:

- I have a vivid imagination.
- I have difficulty understanding abstract ideas (reversed).
- I do not have a good imagination (reversed).
- I am not interested in abstract ideas (reversed).

Parent Binary

Parents were coded as 1, while the others were coded as 0 ([Sibley 2021](#)).

Items:

- If you are a parent, in which year was your eldest child born?

Partner Binary

Coded as binary (has partner = 1) ([Sibley 2021](#)).

Items:

- What is your relationship status? (e.g., single, married, de-facto, civil union, widowed, living together, etc.)

Political Conservative

- Please rate how politically liberal versus conservative you see yourself as being.

Rural Gch 2018 1

“Participants residence locations were coded according to a five-level ordinal categorisation ranging from Urban to Rural.” ([Whitehead et al. 2023](#)).

Items:

- High Urban Accessibility = 1, Medium Urban Accessibility = 2, Low Urban Accessibility = 3, Remote = 4, Very Remote = 5.

Right Wing Authoritarianism

Right Wing Authoritarianism was measured using the following items ([Altemeyer 1996](#)).

Items:

- It is always better to trust the judgment of the proper authorities in government and religion than to listen to the noisy rabble-rousers in our society who are trying to create doubt in people’s minds.
- It would be best for everyone if the proper authorities censored magazines so that people could not get their hands on trashy and disgusting material.
- Our country will be destroyed some day if we do not smash the perversions eating away at our moral fibre and traditional beliefs.
- People should pay less attention to The Bible and other old traditional forms of religious guidance, and instead develop their own personal standards of what is moral and immoral.

- Atheists and others who have rebelled against established religions are no doubt every bit as good and virtuous as those who attend church regularly.
- Some of the best people in our country are those who are challenging our government, criticizing religion, and ignoring the “normal way” things are supposed to be done (reversed).

Social Dominance Orientation

Social Dominance Orientation was measured using the following items ([Sidanius and Pratto 1999](#)).

Items:

- It is OK if some groups have more of a chance in life than others.
- Inferior groups should stay in their place.
- To get ahead in life, it is sometimes okay to step on other groups.
- We should have increased social equality (reversed).
- It would be good if groups could be equal (reversed).
- We should do what we can to equalise conditions for different groups (reversed).

Outcome Measures

Measures for Outcomes Assessed

Religion

Religion outcomes are described in Table 10. All New Zealand Attitudes and Values Measures of Religion/Spirituality were assessed.

Table 10: Religion outcome domains and example dimensions

Measure	Item(s)	Source
Belief in God	“Do you believe in a God?”	(Eurobarometer 2005)
Belief in Spirit	“Do you believe in some form of spirit or life force?”	(Eurobarometer 2005)
Monthly Religious Service Attendance	“How many times did you attend a church or place of worship in the last month?”	(Sibley and Bulbulia 2012)
Religious Identification Level	“How important is your religion to how you see yourself?”	(Sibley 2021)
Spiritual Identification Level	“I identify as a spiritual person”	(Sibley 2021)
Weekly Prayer	“How many times did you pray in the last week?”	(Bulbulia <i>et al.</i> 2015)
Weekly Scripture	“How many times did you read religious scripture in the last week?”	(Bulbulia <i>et al.</i> 2016)

Discrimination

Discrimination measures are described in Table 11. All New Zealand Attitudes and Values Measures of perceived discrimination were assessed.

Table 11: Perceived Discrimination measures are described (Sibley 2021).

Measure	Item(s)
Perceived Age Discrimination	“I feel that I am often discriminated against because of my age.”
Perceived Ethnic Discrimination	“I feel that I am often discriminated against because of my ethnicity.”
Perceived Gender Discrimination	“I feel that I am often discriminated against because of my gender.”
Perceived Religious Discrimination	“I feel that I am often discriminated against because of my religious/spiritual beliefs.”

Well-Being

We investigate well-being using an *outcome-wide* approach (VanderWeele *et al.* 2020). We categorised outcomes into five domains—health, psychological well-being, present-reflective outcomes, life-reflective outcomes, and social outcomes—based on validated scales and measures. Outcomes were based on those modelled in an earlier outcome-wide paper Rosa *et al.* (2024), and described in Bulbulia (2024a) Table 12 summarises each domain and

its associated measures. For instance, health outcomes included BMI and hours of sleep, whereas psychological well-being included anxiety and depression.

Table 12: Well-being outcome domains and example dimensions. Data summaries for all measures used in this study are provided in [S2](#).

Domain	Example Measures
Health	Alcohol Frequency, Alcohol Intensity, BMI, Hours of Sleep, Hours of Exercise, SF-Health
Psychological Well-Being	Anxiety, Depression, Fatigue, Rumination
Present-Reflective	Body Satisfaction, Forgiveness, Self-Esteem, Sexual Satisfaction
Life-Reflective	Gratitude, Life Satisfaction, Meaning (Sense & Purpose), Personal Wellbeing Index
Social	Belonging, Support, Community

Descriptions for all measures are as follows:

Belonging Acceptance

- Know that people in my life accept and value me.

Belonging Shared Beliefs

We assessed felt belongingness with three items adapted from the Sense of Belonging Instrument (Hagerty & Patusky, 1995): (1) “Know that people in my life accept and value me”; (2) “Feel like an outsider”; (3) “Know that people around me share my attitudes and beliefs”. Participants responded on a scale from 1 (Very Inaccurate) to 7 (Very Accurate). The second item was reversely coded ([Hagerty and Patusky 1995](#)).

Belonging Outsider (Reversed)

We assessed felt belongingness with three items adapted from the Sense of Belonging Instrument (Hagerty & Patusky, 1995): (1) “Know that people in my life accept and value me”; (2) “Feel like an outsider”; (3) “Know that people around me share my attitudes and beliefs”. Participants responded on a scale from 1 (Very Inaccurate) to 7 (Very Accurate). The second item was reversely coded ([Hagerty and Patusky 1995](#)).

Forgiveness

We assessed participants’ forgiveness using reversed scores of the NZAVS “vengeful rumination scale.” This scale contains three items, adapted from Caprara ([1986](#)) and Berry *et al.* ([2005](#)), and developed for NZAVS, ordinal response scale 1-7 (1 = Strongly Disagree to 7 = Strongly Agree) Caprara ([1986](#)).

Items:

- Sometimes I can’t sleep because of thinking about past wrongs I have suffered.
- I can usually forgive and forget when someone does me wrong.
- I find myself regularly thinking about past times that I have been wronged.

Gratitude

Ordinal response scale 1 = Strongly Disagree to 7 = Strongly Agree ([McCullough *et al.* 2002](#)).

Items:

- I have much in my life to be thankful for.
- When I look at the world, I don't see much to be grateful for (reversed).
- I am grateful to a wide variety of people.

Fatigue

- During the last 30 days, how often did ... you feel exhausted?

Sleep

Open-ended response ([Buysse et al. 1989](#)).

Items:

- During the past month, on average, how many hours of actual sleep did you get per night?

Anxiety

- During the past 30 days, how often did...you feel restless or fidgety?
- During the past 30 days, how often did...you feel that everything was an effort?
- During the past 30 days, how often did...you feel nervous?

Depression

- During the past 30 days, how often did...you feel hopeless?
- During the past 30 days, how often did...you feel so depressed that nothing could cheer you up?
- During the past 30 days, how often did...you feel you feel restless or fidgety?

Life Satisfaction

From Diener *et al.* ([1985](#)).

Items:

- I am satisfied with my life.
- In most ways my life is close to ideal.

Hours of Exercise (log)

We took the natural log of the response + 1 ([Sibley et al. 2011](#)).

Items:

- Hours spent...exercising/physical activity.

Meaning Purpose

From Steger *et al.* ([2006](#)).

Items:

- My life has a clear sense of purpose

Meaning Sense

From Steger *et al.* (2006).

Items:

- I have a good sense of what makes my life meaningful.

Neighbourhood Community

From Sengupta *et al.* (2013).

Items:

- I feel a sense of community with others in my local neighbourhood.

Perceived Age Discrimination

- I feel that I am often discriminated against because of my age.

Perceived Ethnic Discrimination

- I feel that I am often discriminated against because of my ethnicity.

Perceived Gender Discrimination

- I feel that I am often discriminated against because of my gender.

Perceived Religious Discrimination

- I feel that I am often discriminated against because of my religious/spiritual beliefs.

Perfectionism

From Rice *et al.* (2014)].

Items:

- Doing my best never seems to be enough.
- My performance rarely measures up to my standards.
- I am hardly ever satisfied with my performance.

PWB Standard Living

From Cummins *et al.* (2003).

Items:

- Please rate your level of satisfaction with the following aspects of your life...Your standard of living.

PWB Your Future Security

From Cummins *et al.* (2003).

Items:

- Please rate your level of satisfaction with the following aspects of your life...Your future security.

PWB Your Health

From Cummins *et al.* (2003).

Items:

- Please rate your level of satisfaction with the following aspects of your life...Your health.

PWB Your Relationships

From Cummins *et al.* (2003).

Items:

- Please rate your level of satisfaction with the following aspects of your life...Your personal relationships.

Belief in God

Binary response: (0 = No, 1 = Yes) ([Eurobarometer 2005](#)).

Items:

- Do you believe in a God?

Belief in Spirit

Binary response: (0 = No, 1 = Yes) ([Eurobarometer 2005](#)).

Items:

- Do you believe in some form of spirit or life force?

Monthly Religious Service Attendance

Numerical: open-ended response ([Sibley and Bulbulia 2012](#)).

Items:

- How many times did you attend a church or place of worship in the last month?

Religious Identification Level

- How important is your religion to how you see yourself?

Weekly Prayer

Numerical: open-ended response ([Bulbulia *et al.* 2015](#)).

Items:

- Do you identify with a religion and/or spiritual group? -> How many times did you pray in the last week?

Weekly Scripture

Numerical: open-ended response ([Bulbulia *et al.* 2016](#)).

Items:

- Do you identify with a religion and/or spiritual group? -> How many times did you read religious scripture in the last week?

Spiritual Identification Level

- I identify as a spiritual person

Rumination

Ordinal responses: 0 = None of The Time, 1 = A little of The Time, 2 = Some of The Time, 3 = Most of The Time, 4 = All of The Time ([Nolen-hoeksema and Morrow 1993](#)).

Items:

- During the last 30 days, how often did...you have negative thoughts that repeated over and over?

Self Control Have Lots

From Tangney *et al.* ([2004](#)).

Items:

- In general, I have a lot of self-control.

Self Control Wish more Reversed

From Tangney *et al.* ([2004](#)).

Items:

- I wish I had more self-discipline.

Self Esteem

From Rosenberg ([1965](#)).

Items:

- On the whole am satisfied with myself.
- Take a positive attitude toward myself.
- Am inclined to feel that I am a failure (reversed).

Self Esteem

From Rosenberg ([1965](#)).

Items:

- On the whole, I am satisfied with myself.
- Take a positive attitude toward myself.
- I am inclined to feel that I am a failure (reversed).

Short Form Health

- In general, would you say your health is...

Social Support

- There are people I can depend on to help me if I need it.
- There is no one I can turn to for guidance in times of stress (reversed).
- I know there are people I can turn to when I need help.

Supplement 3: Predictive Plots of Results

Table 1 in the main text breaks down the covariate-adjusted comparisons between Muslim and non-Muslim New Zealanders. Figures 1–7 offer a visual guide to these findings, detailing differences in religious identity (Figure 1), discrimination (Figure 2), and well-being (Figure 3–Figure 7).

Comparative Visualizations

Adjusted for Age, Born in NZ, Ethnicity, and Gender

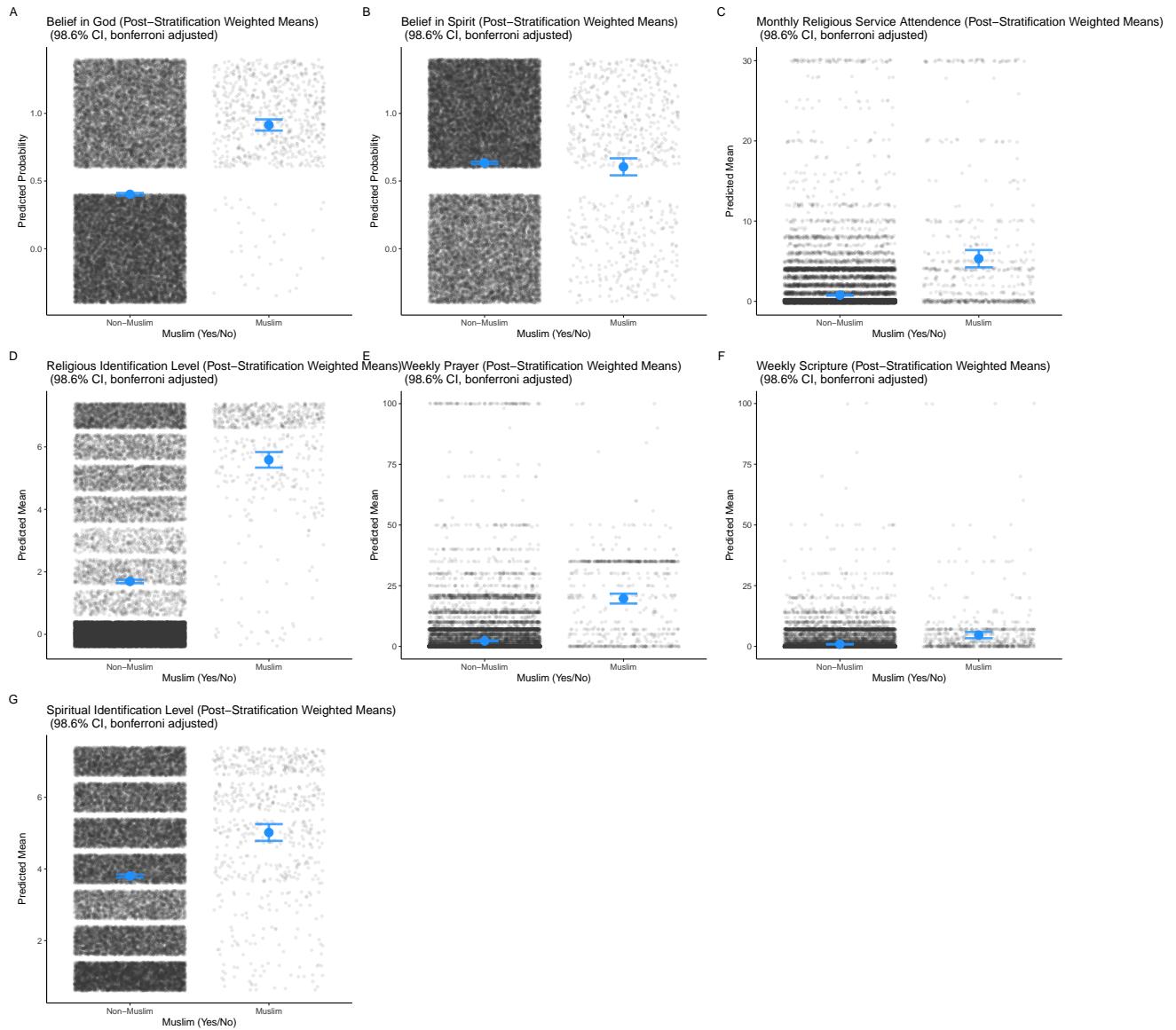


Figure 1: Comparative Models of Religious Beliefs and Behaviours

Comparative Visualizations
Adjusted for Age, Born in NZ, Ethnicity, and Gender

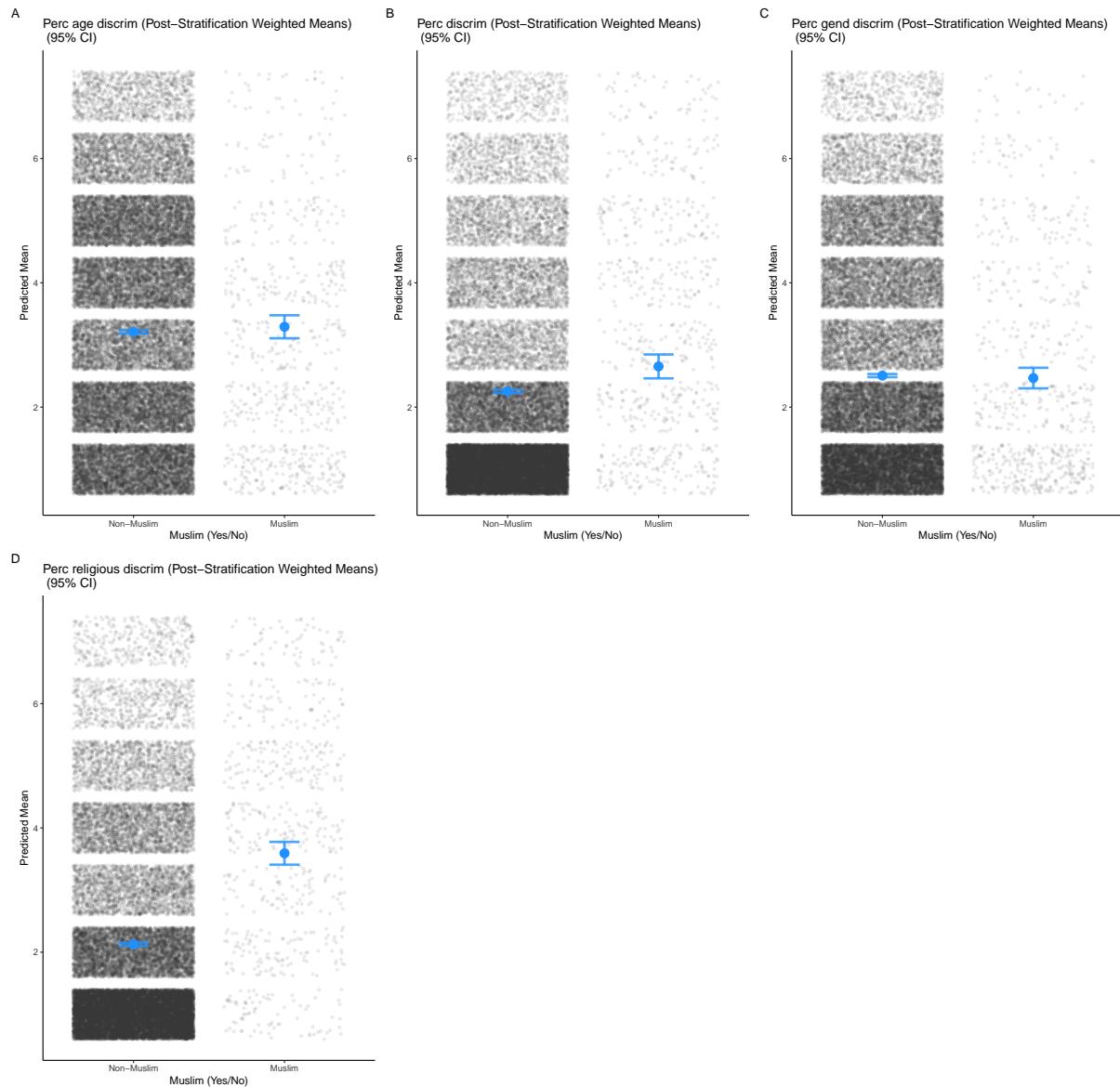


Figure 2: Perceived Discrimination

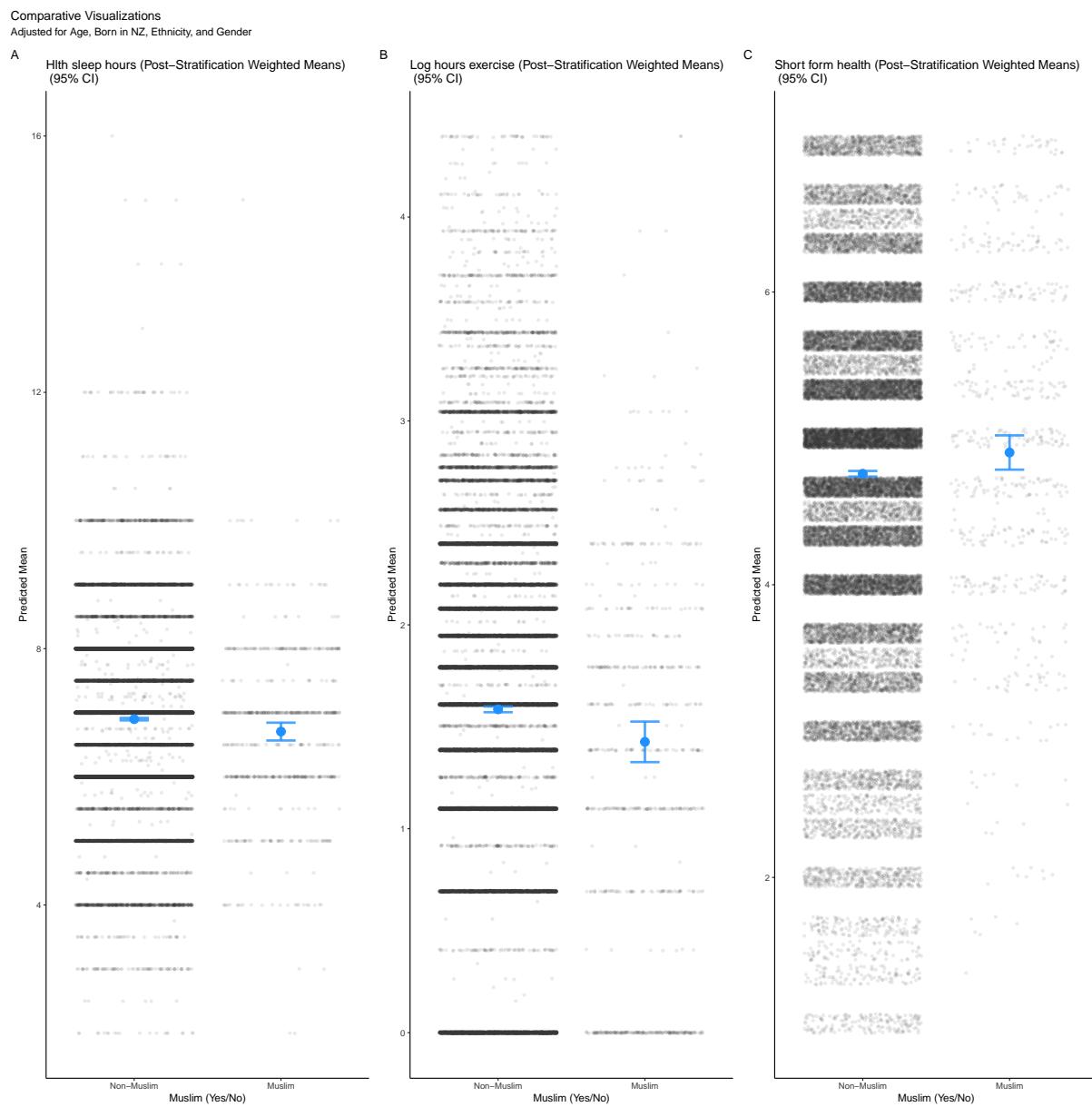


Figure 3: Biological Health

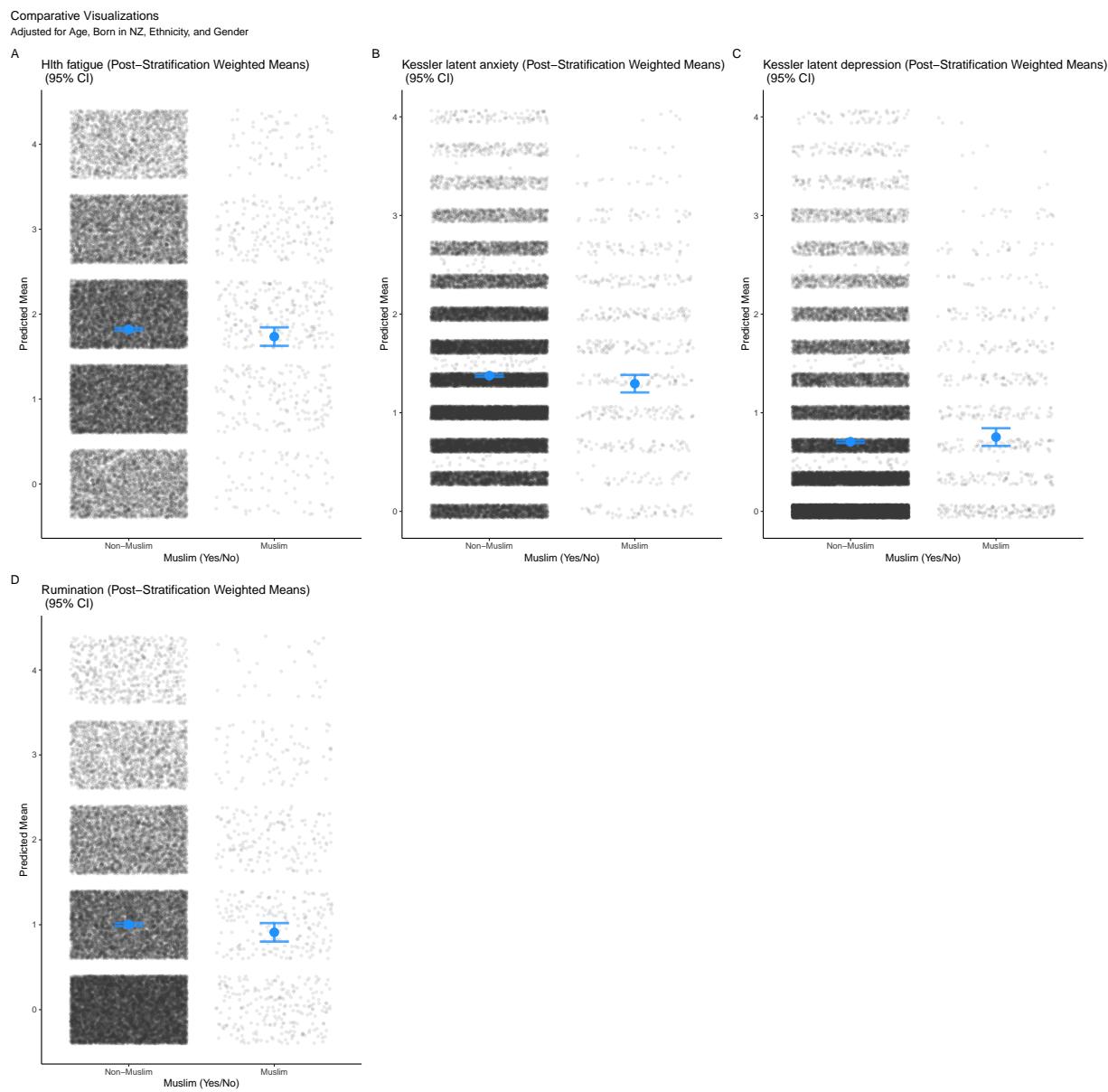


Figure 4: Psychological Health

Comparative Visualizations
Adjusted for Age, Born in NZ, Ethnicity, and Gender

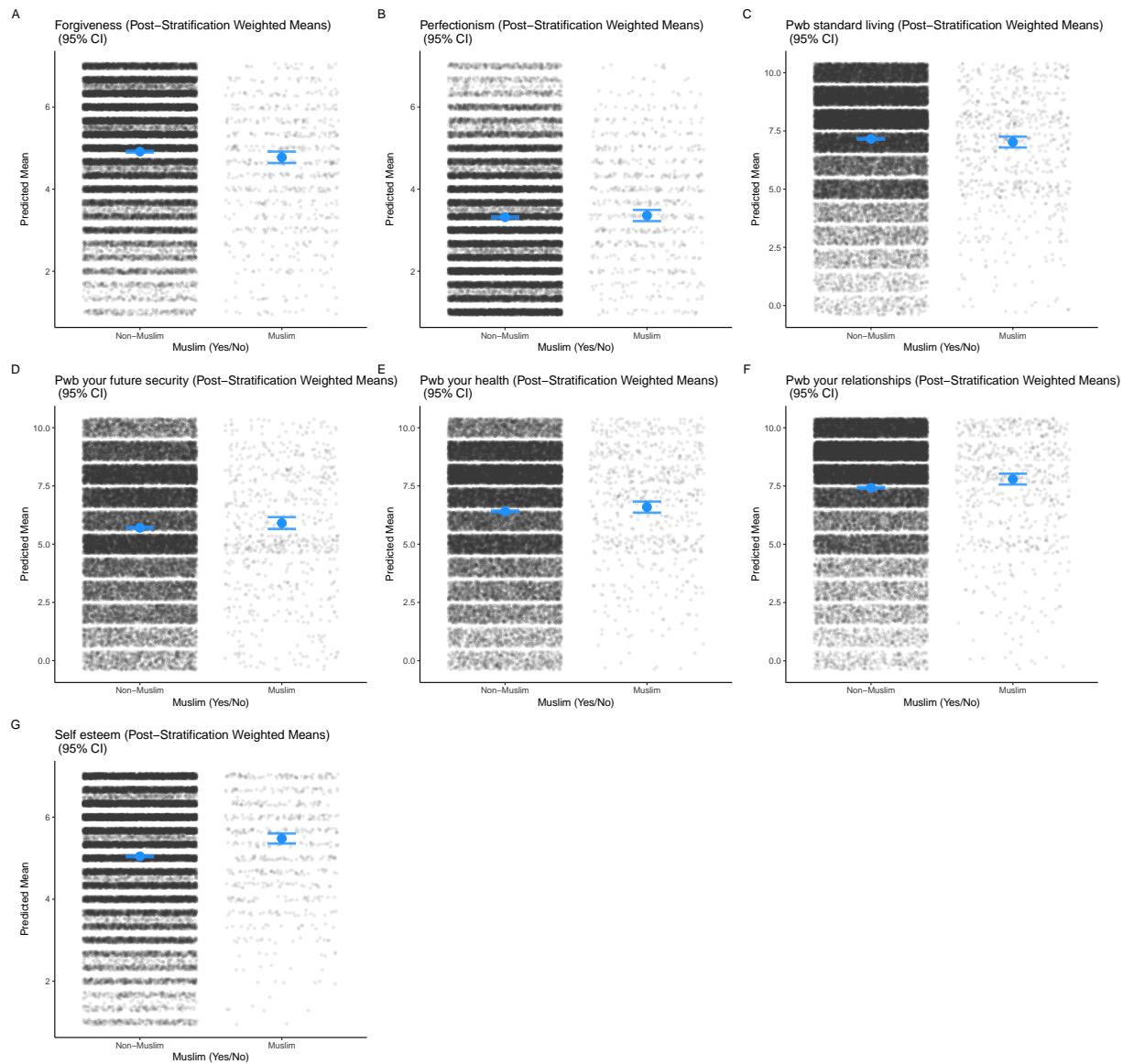


Figure 5: Self-Esteem, Forgiveness, Perfectionism

Comparative Visualizations
Adjusted for Age, Born in NZ, Ethnicity, and Gender

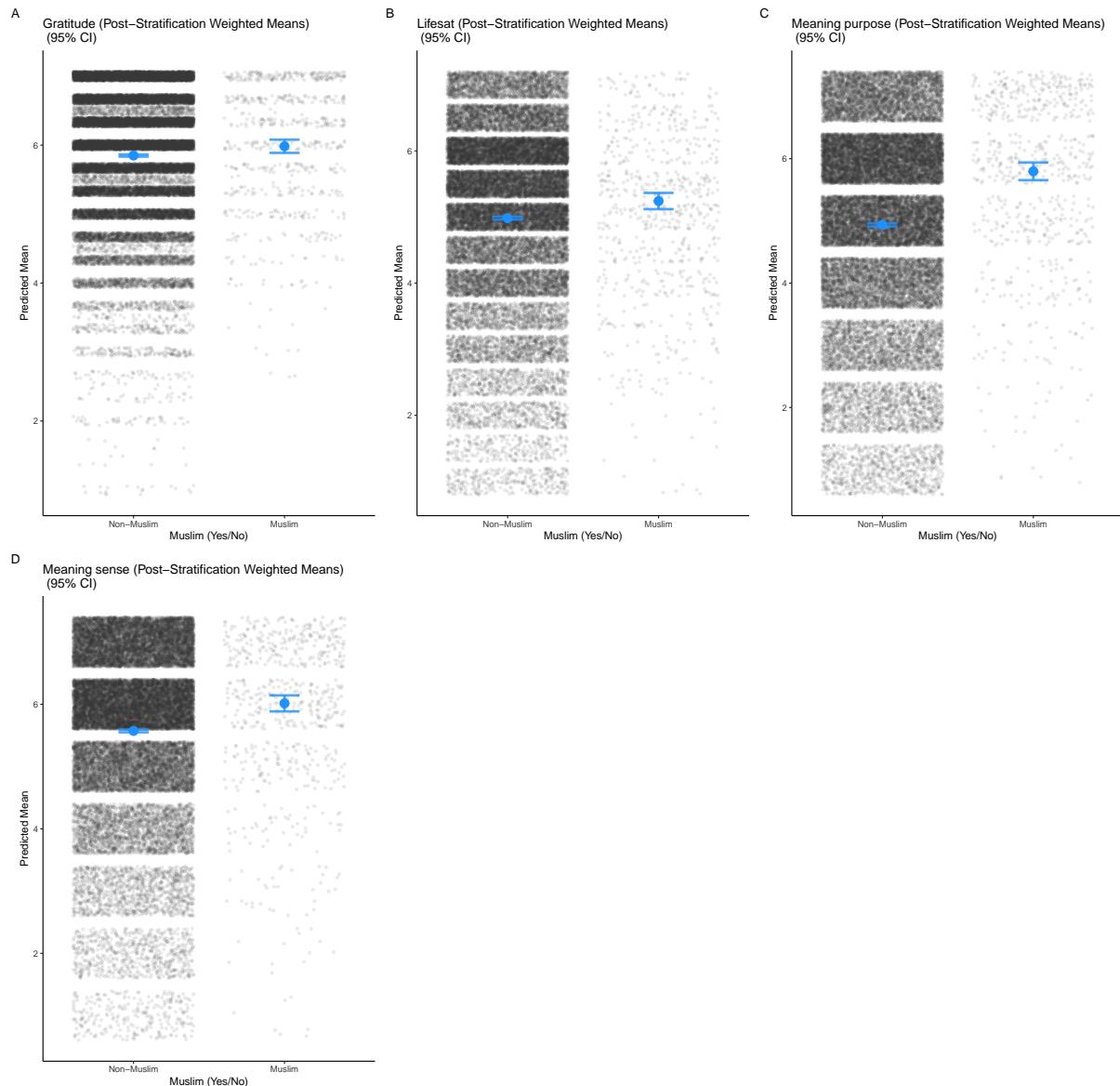


Figure 6: Life Related Well-Being

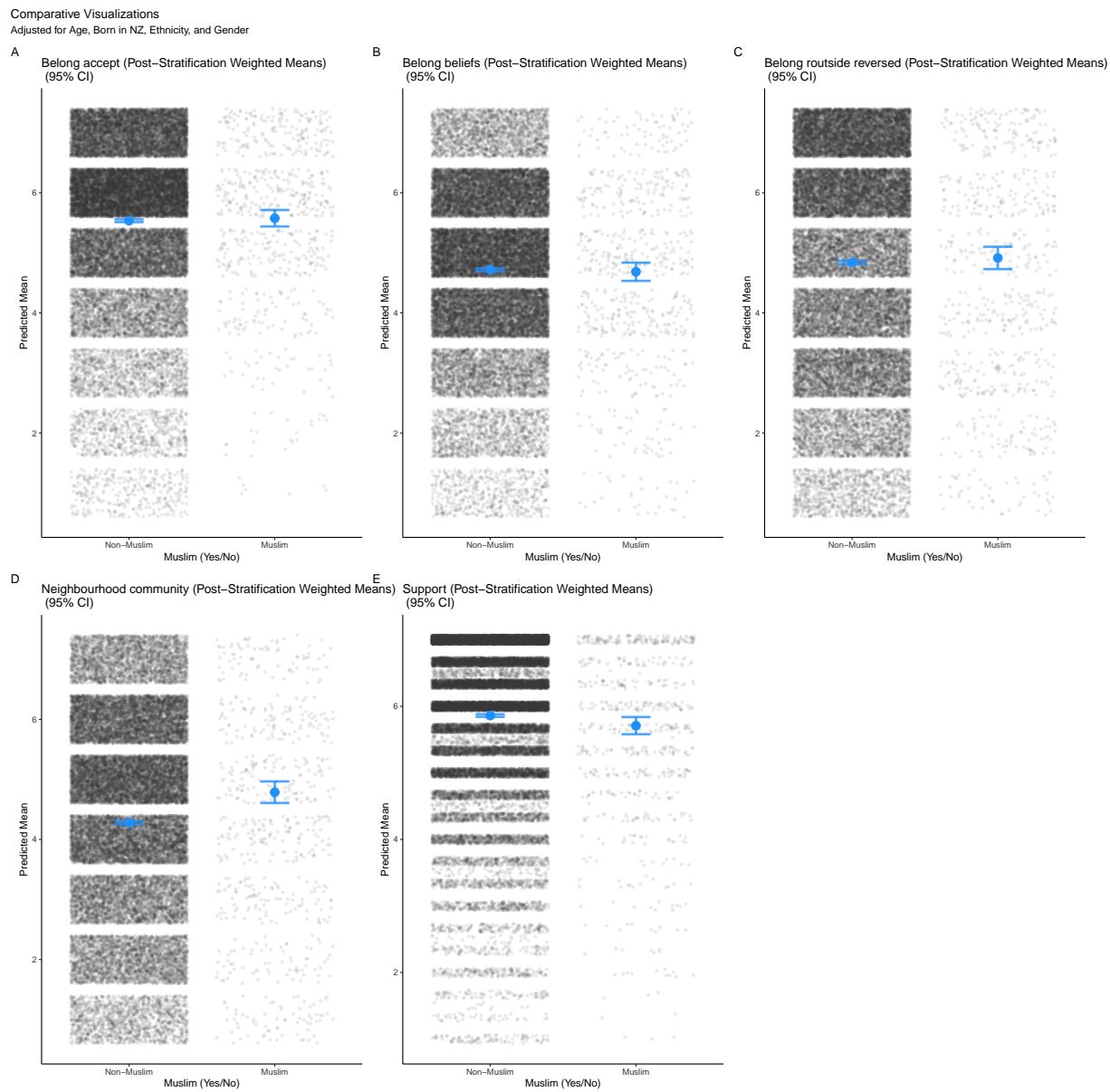


Figure 7: Social Support

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