



SURROGACY, SOCIAL POLICY AND ECONOMIC DEVELOPMENT

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AUTHORS' CONTRIBUTIONS

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ABSTRACT

Surrogacy policy is a highly complex global policy that has important ramifications, yet it is unclear how a country's socio-economic status can influence its surrogacy policy. This study quantitatively assessed the influence of economic development on surrogacy policy in 84 countries. Using an internet analytic search and comprehensive literature review, countries were identified for study. Each country's surrogacy policy and economic development were characterized and an analysis of the relationship between economic development and surrogacy policy was conducted. The analysis demonstrated that economic development acts as a negative predictor for more liberal surrogacy policy, despite its positive impact on other social policies such as abortion and same-sex marriage. This disparity highlights the need for governments to more holistically examine their existing surrogacy policies and ensure greater internal alignment with their other social policies.

Keywords: Surrogacy; public policy; economic development; assisted reproduction.

1. INTRODUCTION

Surrogacy is an arrangement where a woman agrees to bear a child for another person or persons, who subsequently become the child's parents upon birth [1,2]. Infertility is the most common reason for surrogacy [1]. These may be attributed to congenital conditions, reproductive organ abnormalities or genetic anomalies [2,3,4]. Women are also getting married later and are more likely to experience high-risk pregnancies, causing more to turn to surrogacy [5,6]. New demand for surrogacy has been created with a more progressive and inclusive society as same-sex marriage and elective single parenthood become increasingly commonplace [7,8].

Other considerations for surrogacy include cost [9,10], healthcare service quality [11,12], regulatory support

[13] and internet access [14]. However, each of these considerations is highly influenced by the economic development of countries. Societal affluence makes surrogacy a more affordable option for many [15], and more advanced health systems are better able to support surrogacy arrangements to term [16]. Similarly, countries that have robust legal for surrogacy are also those that are more economically developed [17,18,19], while the advantages of the internet have only been realised in more affluent countries where literacy rates are high [20].

This research studied the impact that a country's economic status may have on these factors, evaluated whether a country's economic status has a corresponding impact on the type of surrogacy position that the country adopts, and determined how

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a country's surrogacy policy may be influenced by its economic status.

2. METHODS

The methodology for this study comprised of four parts: (1) identifying countries for study; (2) characterising surrogacy policies; (3) characterising economic development; and (4) analysis of relationship between economic development and surrogacy policy.

2.1 Identifying Countries for Study

Internet web data was harnessed using Google web search analytics. The top five English search terms related to surrogacy and the term "surrogacy" were then geo-located based on originating Google search source. This helped to identify the countries from which surrogacy and surrogacy-related searches had taken place. In total, there were 164 originating geographical search sources found for all the six surrogacy-related search terms. After removing duplicates, there were 84 countries identified. Some of the countries where search sources originated from included Australia, UK and US. The bulk of search

sources appeared to be from Asia and Europe, with only a handful of search sources originating from Middle East and Africa. Fig. 1 shows the geographical spread of the countries (shaded in red), while Table 1 lists the countries by region.

2.2 Characterising Surrogacy Policies

The surrogacy policies of the 84 countries listed in Table 1 were then reviewed via a comprehensive search of documented surrogacy transactions and cases, recent academic literature and critiques, as well as published international and government reports. Key aspects of surrogacy policies that were elucidated included: (1) status of surrogacy prohibition (2) type of surrogacy practised; (3) presence of third-party surrogacy agents; and (4) presence of transnational surrogacy.

Taking into consideration the influence that same-sex marriage has on growing interest in surrogacy, as well as the parallels drawn between the development of abortion and surrogacy [21,22,23,24], two other social policy positions were also examined – the ability to request for abortion and the legal status of same-sex marriage.



Fig. 1. Geographical spread of countries studied (shaded in red)

Source: Author

Table 1. List of countries by region

AMERICA	WESTERN EUROPE	EASTERN EUROPE	MIDDLE EAST/ AFRICA	AUSTRALASIA
United States	United Kingdom	Czech Republic	Israel	India
Canada	Ireland	Cyprus	UAE	China
Costa Rica	Italy	Albania	Egypt	Vietnam
Argentina	Sweden	Russia	Lebanon	Cambodia
Mexico	France	Lithuania	Iran	Thailand
Bolivia	Belgium	Latvia	Saudi Arabia	Nepal
Brazil	Germany	Estonia	Oman	Pakistan
Chile	Netherlands	Croatia	Bahrain	Malaysia
Colombia	Denmark	Kazakstan	Nigeria	Singapore
Ecuador	Spain	Armenia	South Africa	Indonesia
Paraguay	Switzerland	Slovenia	Kenya	Japan
Peru	Austria	Hungary	Ghana	South Korea
Uruguay	Norway	Turkey		Philippines
Venezuela	Finland	Romania		Bangladesh
Guatemala	Greece	Bulgaria		Mongolia
	Portugal	Poland		Laos
	Iceland	Slovakia		Myanmar
		Romania		Brunei
		Georgia		Sri Lanka
		Ukraine		Australia
				New Zealand

Source: Author

2.3 Characterising Economic Development

Indicators characterising the economic development of the selected countries were collated via internationally published data from established and validated research databases such as the World Development Report and United Nations Population and Vital Statistics Report (Table 2). As there is no

standard or fixed set of indicators to measure economic development, indicators were selected by taking reference from past literature examining socio-economic status by country [25,26,27,28]. These included population age and structure, the quality of their social systems such as healthcare and education, household income per capita, and gross domestic expenditure per capita.

Table 2. Factors that influence economic development

Factors influencing economic development	Indicators (unit)
Population age and structure ¹	Annual population growth rate (%) Total fertility rate (%) Age dependency ratio (years) Average life expectancy at birth (years)
Quality of social systems ²	Infant mortality rate (one-year mortality per 1000 live births) Amount of GDP sent on healthcare (%) Adult literacy rate (% of adults able to read at age 15) Presence of dominant religion
Wealth of country ^{2,3}	GDP per capita (USD) Average income per capita (USD)

¹Source: United Nations Population and Vital Statistics Report, 2019 [25]

²Source: World Development Indicators 2019 [26]

³Source: World Data Information, Trading Economics 2019 [28]

2.4 Analysis of the Relationship between Economic Development and Surrogacy Policy

Fischer’s exact test, Kruskal Wallis test, Wilcoxon signed-rank test and logistic regression were used to elucidate the relationship between a country’s economic development and its surrogacy policy. These methods took into account the potential limitations of a sample size of less than 100.

3. RESULTS

A total of 84 countries were selected for study based on the results of web-search aggregation and geo-location. Findings of the web-search aggregation showed that interest in the word “surrogacy” had increased approximately two-fold over the period between 2005 and 2020 (Fig. 2). Search terms were assessed for degree of closeness i.e. the percentage likelihood that terms were searched in conjunction with the term “surrogacy”. In this 15-year period, the top five most closely related search queries associated with the search term “surrogacy” were the search

terms - “surrogate”, “India surrogacy”, “surrogacy meaning”, “surrogacy cost” and “what is surrogacy”.

Further review of the trends relating to these five search terms showed that with the exception of the term “surrogate”, there were generally upgoing trends in terms of web interest over the same 15-year period of 2005 to 2020 (Fig. 3). The search term that had the most consistent increase was “surrogacy cost”, while interest in the term “India surrogacy” stagnated somewhat after 2017. This coincided with the passing of the Surrogacy Bill in 2016, which banned commercial surrogacy and restricted use of surrogacy services to legally wed couples only.

To identify the countries of interest, the regions which had searched for the top five surrogacy- related terms (“surrogacy cost”, “India surrogacy”, “what is surrogacy”, “surrogate”, “surrogacy meaning”) as well as the term “surrogacy” were geolocated. The regions from which these six surrogacy-related web searches originated were then identified and ranked based on frequency.

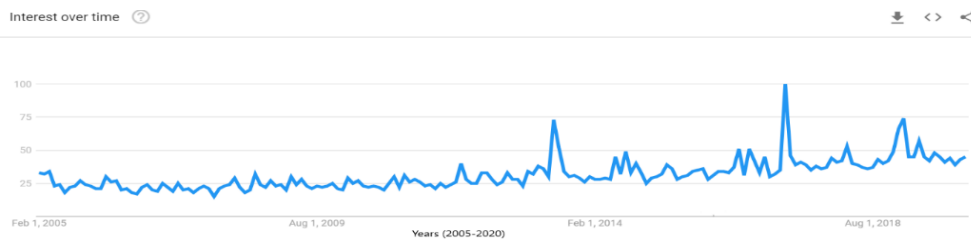


Fig. 2. Interest in web search term “surrogacy” (2005-2020)

Source: Author

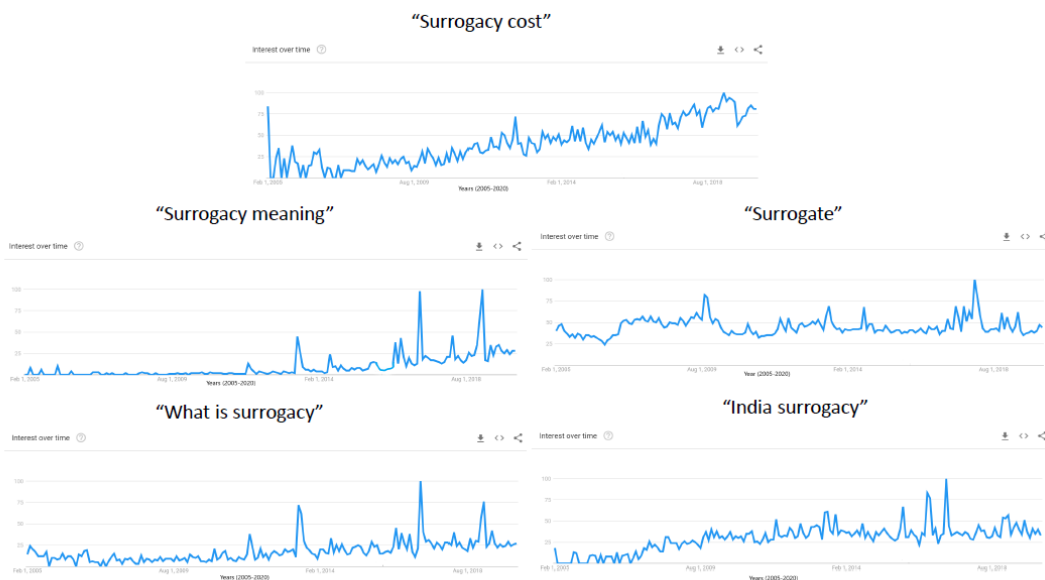


Fig. 3. Interest in closely related surrogacy queries (2005-2020)

Source: Author

3.1 Surrogacy Policies and Practices

Examination of the surrogacy policy in these 84 countries revealed that 41.7% of these countries (36 countries) allowed surrogacy and had some form of legal framework to support surrogacy implementation. 24 countries (28.6%) criminally banned surrogacy while 23 countries (27.3%) had no explicit policy on surrogacy. Only two countries (0.02%) indirectly prohibited surrogacy by disallowing healthcare institutions from providing surrogacy services (Singapore and Indonesia). Fig. 4 summarises the status of surrogacy policy adopted in countries.

Surrogacy policy did not always mirror surrogacy practice. Fig. 5 shows the relationship between surrogacy policy and surrogacy practice. Amongst countries that legally allowed surrogacy, slightly less than half limited surrogacy for altruistic purposes only (17 out of 35 countries, 48.6%). In addition, amongst countries that were silent regarding their surrogacy policy (i.e. neither explicitly prohibited nor explicitly permitted surrogacy), slightly more than half (13 out of 23 countries, 56.5%) practised commercial surrogacy.

In countries that practised only altruistic surrogacy, there was a low prevalence of third-party surrogacy agencies due to restrictions on such commercial entities. Couples who wanted to have children by surrogacy had to harness personal resources to independently establish and facilitate surrogacy arrangements e.g. finding willing friends or family to act as surrogate mothers. Only a small number of countries that practised altruistic surrogacy, allowed the use of third-party agencies as facilitators for surrogacy arrangements (3 out of 45 countries, 6.7%). Amongst countries that practised commercial surrogacy, almost half (48.9%, 23 out of 47 countries)

displayed a dependence on third-party agencies, while slightly more than a quarter (25.5%, 12 out of 47 countries) depended primarily on their fertility clinicians to act as their facilitators (Fig. 6).

Transnational arrangements were the predominant type of arrangements in countries that practised commercial surrogacy (Fig. 7). Only four countries limited commercial surrogacy arrangements to the domestic market. They were Israel, India, Japan and Thailand. Of these four, two (India and Thailand) had changed their law about transnational commercial surrogacy between 2015 and 2020. As expected, the predominant surrogacy arrangements in countries that practised only altruistic surrogacy were domestic. Many of these countries had limited altruistic surrogacy to the domestic market due to enforcement obstacles.

3.2 Same-Sex Marriage and Abortion

Apart from the status of their surrogacy policy, countries were also evaluated for the status of two other social policies, namely abortion and same-sex marriage policies. A country's position on surrogacy, abortion and same-sex marriage policies could be categorised into one of eight different groups as indicated in Table 3. In total, of the 84 countries reviewed, 50 countries allowed females to seek an abortion upon request (59.5%), while 40 countries legally recognised same-sex marriages as equivalent to heterosexual marriage (47.6%). Among the eight groups, countries in Group 4 (15 countries, 17.9%) were most liberal – permitting surrogacy, same-sex marriage and abortion on request, while countries in Group 5 (8 countries, 9.5%) were most conservative – prohibiting surrogacy, same-sex marriage and abortions on request.

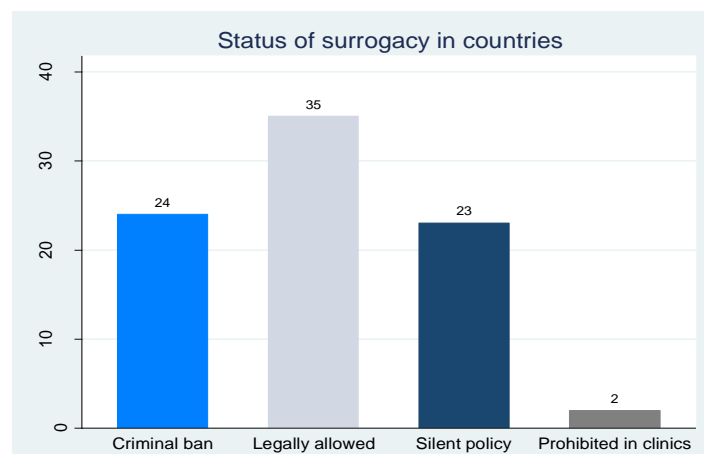


Fig. 4. Status of surrogacy policy adopted in countries

Source: Author

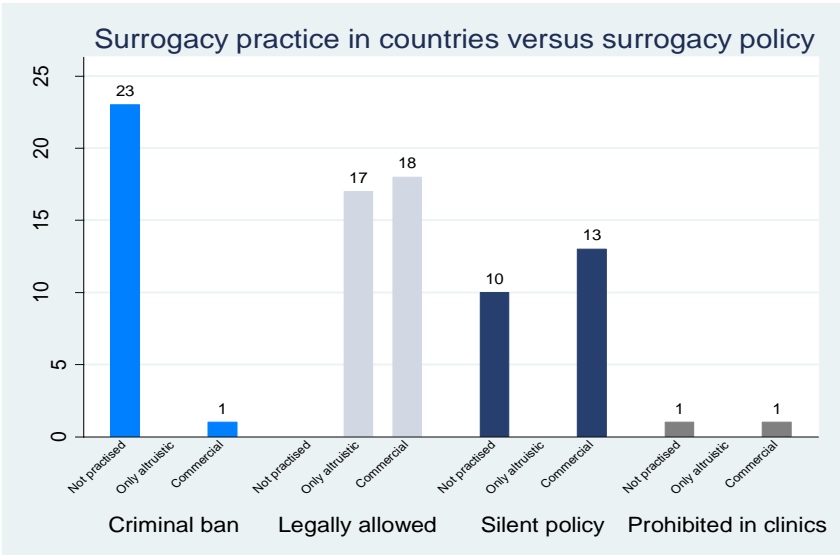


Fig. 5. Surrogacy practice in countries versus surrogacy policy
 Source: Author

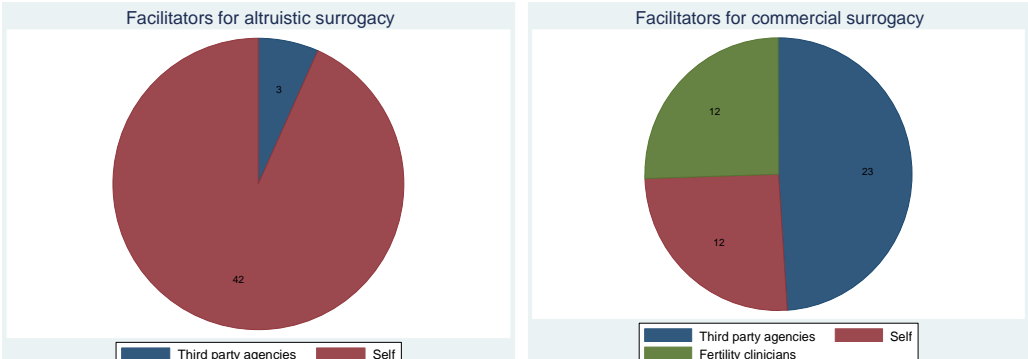


Fig. 6. Facilitators for surrogacy arrangements
 Source: Author

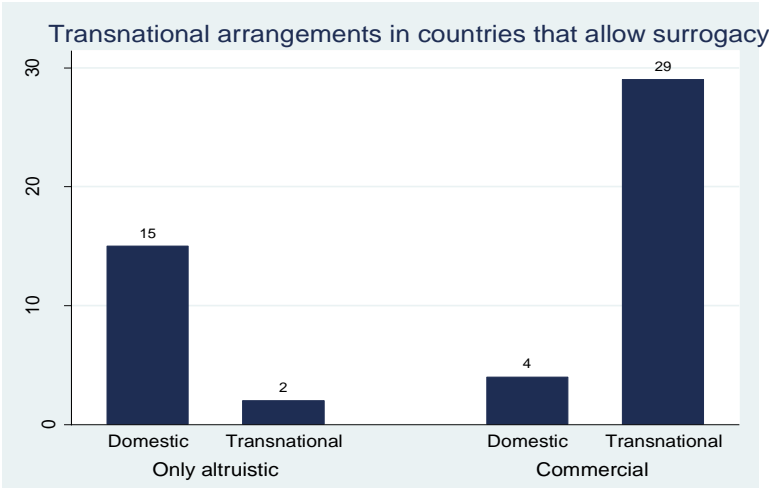


Fig. 7. Transnational arrangements in countries that allow surrogacy
 Source: Author

72.5% of the 40 countries that legalised same-sex marriage (29 countries in Groups 1, 4 and 6) allowed for abortion on request, with only 11 countries (Group 6, 13.1%) prohibiting abortion on request. However, this was inverted when examining surrogacy policy, with only 35% of these countries (14 countries in Group 1) allowing surrogacy. The vast majority (65%, 26 countries in Groups 2, 4 and 6), prohibited surrogacy. Interestingly, there were no countries that had legalised same-sex marriage but had banned surrogacy and abortions on request (Group 2).

3.3 Population Age and Structure

Apart from India and China with populations exceeding one billion people, the population sizes of the other countries were relatively smaller with a mean of ~77 million per country. The mean age dependency ratio was 50.4%. This was lower than the global average age dependency ratio of 54.8% in 2018 [29]. Similarly, the mean total fertility rate (TFR) of the countries was 2.0 births per woman, lower than the global average of 2.4 births per woman in 2017

[30]. Amongst the countries studied, a trend of decreasing fertility associated with increased life expectancy and lower age dependency was observed (Fig. 8). This indicated that countries that displayed an interest in surrogacy had older and less fertile populations.

3.4 Quality of Social Systems

The quality of social systems was determined by the country’s expenditure on healthcare, literacy rates and infant mortality rates of the 84 countries (Fig. 9).

3.4.1 Literacy rate

More than half of the countries cited a literacy rate of 98% or more (46 out of 84 countries, 54.8%). The average literacy rate in people above the age of 15 years old was 94% with the lowest literacy rate of 59% seen in Pakistan. This was higher than the global average of 86.3% cited by UNESCO Institute for Statistics [31].

Table 3. Countries grouped by surrogacy, abortion and same-sex marriage policies

Groups	Ban or prohibition on surrogacy	Legalised same-sex marriage	Abortion available on request	Number of countries (%)	Examples of countries
1	Y	Y	Y	14 (16.7)	France, Finland
2	Y	Y	N	0 (0)	N/A
3	Y	N	Y	4 (4.8)	Switzerland, Singapore
4	N	Y	Y	15 (17.9)	Australia, UK, US
5	Y	N	N	8 (9.5)	Egypt, UAE
6	N	Y	N	11 (13.1)	Brazil, Argentina
7	N	N	Y	17 (20.2)	Ukraine, Russia
8	N	N	N	15 (17.9)	Sri Lanka, Bangladesh

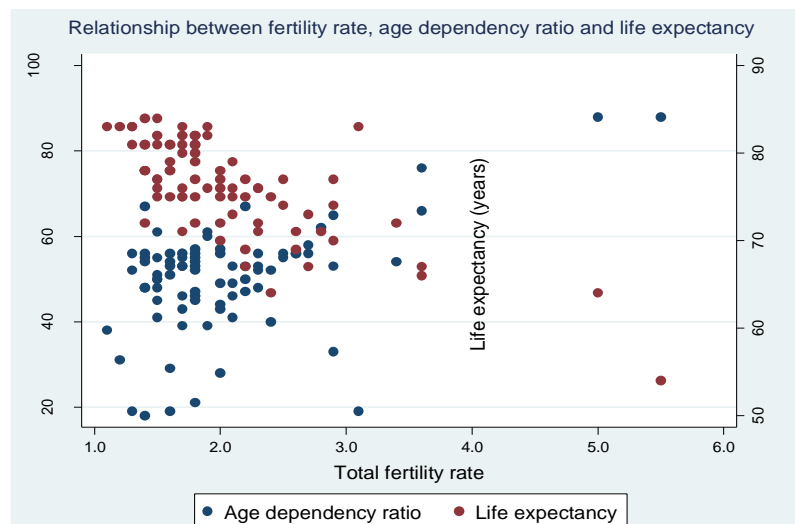


Fig. 8. Relationship between fertility rate, age dependency ratio and life expectancy

Source: Author

3.4.2 Infant mortality

Average infant mortality was 11.1 deaths in children below the age of 1 year per 1000 live birth. This was also lower than the global average of 29 deaths per 1000 live births cited by the World Health Organisation in 2017 [32].

3.4.3 Healthcare expenditure

Healthcare expenditure was more varied across the identified countries, with average healthcare expenditure 7.0% of GDP. Unlike literacy and infant mortality rates, this was lower than the global average of 10.0% of GDP in 2016 [33].

3.4.5 Religion

In terms of religion, the majority of countries had a single predominant religion (68 out of 84 countries, 81.0%).

3.5 Wealth of Country

The mean GDP per capita amongst the countries was 22,358.75 USD, which was higher than the global

average of 10,857.87 USD in 2018 [34]. However, the median monthly average income per capita of 1184.5 USD was lower than the worldwide quoted figure of 2,920.0 USD [35]. Fig. 10 shows the relative GDP and average income per capita of the countries that were studied. Further analysis showed that surrogacy policy was not more liberal in countries that had legalised same-sex marriage ($z= 0.48, p= 0.633$), or countries that allowed abortion on request ($z= 1.06, p= 0.291$). Conversely, countries that had legalised same-sex marriage were more likely to allow abortion on request, and vice versa ($z= 2.28, p= 0.023$).

3.6 Fertility, Life Expectancy and Age Dependency

When comparing between countries that prohibited surrogacy and those that allowed surrogacy, fertility rates and life expectancy rates differed significantly ($z= 1.979, p=0.048$; $z= -2.474, p=0.013$ respectively) with higher life expectancy rates and lower fertility rates observed in countries that prohibited surrogacy (Fig. 11). However, there was no relationship observed when comparing age dependency ratios ($z= -0.005, p=0.996$), and population size ($z=0.948, p=0.343$).

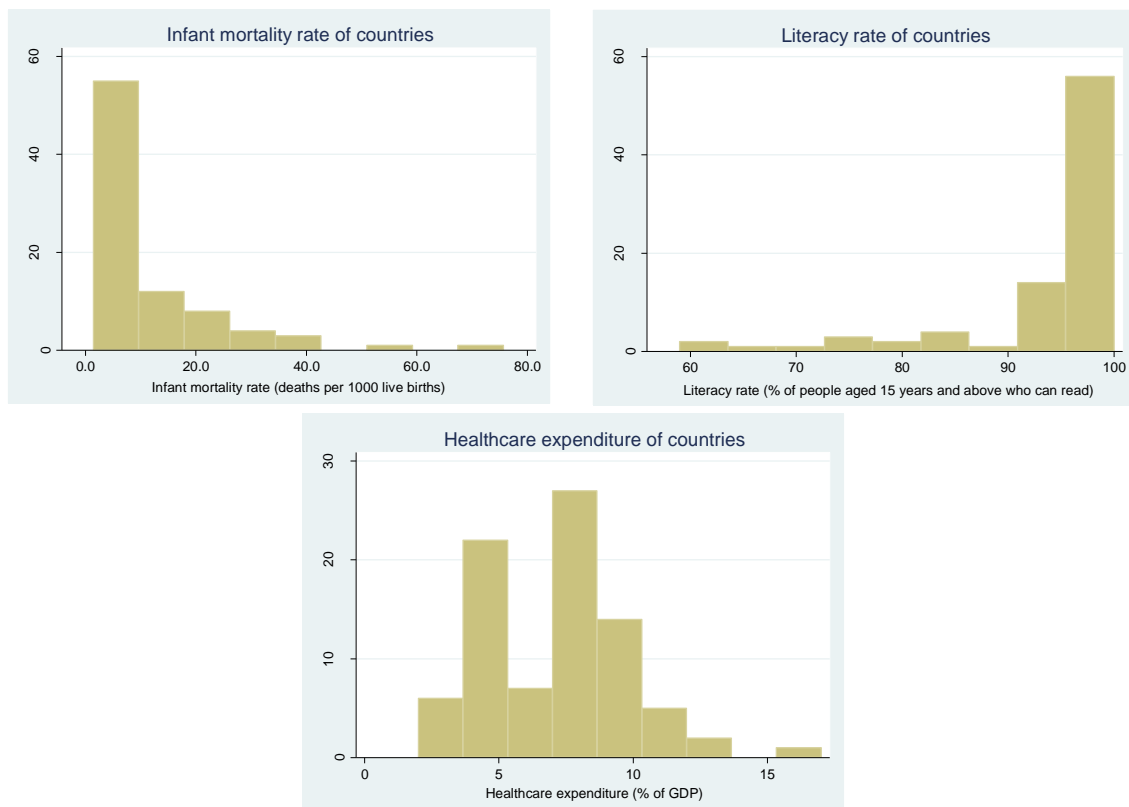


Fig. 9. Healthcare expenditure, literacy rates and infant mortality rates of countries

Source: Author

When comparing between countries that had legalised same-sex marriage and those that had not, life expectancy was longer in those that had legalised same-sex marriage ($z=-3.611$, $p = 0.0003$). The age dependency ratio was also higher in this group of countries ($z=-2.954$, $p=0.0031$). However, there was no significant difference found when examining fertility ($z=1.86$, $p=0.0624$) and population size ($z=1.039$, $p=0.2988$) (Fig. 12).

Countries that permitted abortions on request had longer life expectancy ($z=-2.795$, $p=0.0029$), smaller population size ($z=2.470$, $p=0.0135$) and lower fertility ($z=3.797$, $p=0.0001$) compared to those that did not permit abortions on request, but there was no such association noted with age dependency ($z=-0.178$, $p=0.8586$) (Fig. 13).

3.7 Infant Mortality, Literacy and Healthcare Expenditure

Infant mortality was found to be lower in countries that had prohibitions or bans on surrogacy ($z=2.927$, $p=0.0034$). However, no difference in literacy rates and healthcare expenditure was found between countries that had prohibitions or bans on surrogacy and those that did not (literacy, $z=-1.460$, $p=0.1443$, healthcare expenditure, $z=-1.233$, $p=0.2174$) (Fig. 14). A further logistic regression of healthcare expenditure, literacy and infant mortality in relation to the prohibition or banning of surrogacy found infant mortality, literacy and healthcare expenditure were all not statistically significant predictors of whether a country prohibited or banned surrogacy (literacy, $z=-1.65$, $p=0.099$), infant mortality, $z=-1.88$, $p=0.059$) and healthcare expenditure ($z=0.45$, $p=0.655$). Overall, the test of the overall regression model was also not statistically significant (LR chi-squared 5.90, $p=0.1163$).

This was notably different from abortion policy and same-sex marriage policy. Logistic regression results showed that healthcare expenditure was found to be a significant predictor of whether countries allowed for abortions on request ($z=1.94$, $p=0.052$) or legally recognised same-sex marriage ($z=4.17$, $p=0.00$) (Fig. 15).

Although in both regression models, infant mortality (for abortion, $z=-1.31$, $p=0.191$, for same-sex marriage, $z=0.56$, $p=0.575$) and literacy (for abortion, $z=0.27$, $p=0.789$, for same-sex marriage, $z=0.21$, $p=0.835$) were not found to be significant predictors, the overall regression models for both were statistically significant (for abortion, LR chi-squared 22.96, $p=0.00$, for same-sex marriage, LR chi-squared 35.19, $p=0.00$) (Fig. 16). Of note, presence of a single predominant religion in a country did not significantly influence a country's policy position on surrogacy (Fischer's Exact, $p=0.766$) same-sex marriage (Fischer's Exact, $p=0.580$) or abortion (Fischer's Exact, $p=0.087$).

3.8 Income and GDP

Countries that prohibited surrogacy were more likely to have a higher GDP ($z= -2.467$, $p=0.0136$) and a higher average monthly income ($z= -2.758$, $p=0.058$). Logistic regression further confirmed that GDP and average monthly income were statistically significant predictors of determining whether a country prohibited surrogacy or not (LR chi-squared 9.26, $p=0.0098$) (Fig. 17).

Associations between GDP and average monthly income were also found in relation to abortion and same-sex marriage policy. Countries that allowed abortions on request were more likely to have higher GDP as well as average monthly income ($z = -3.149$, $p=0.0016$) compared with countries that did not allow abortions on request ($z=-3.809$, $p=0.0001$) (Fig. 18).

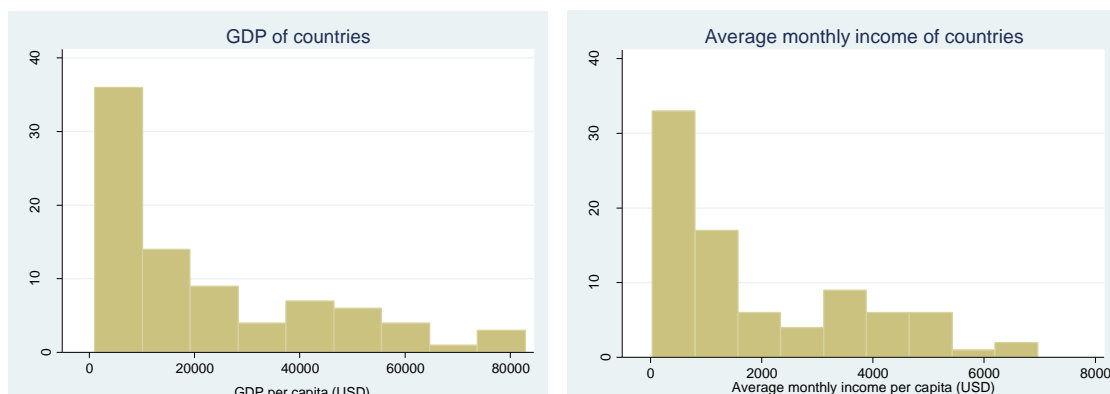


Fig. 10. GDP and average income of countries

Source: Author

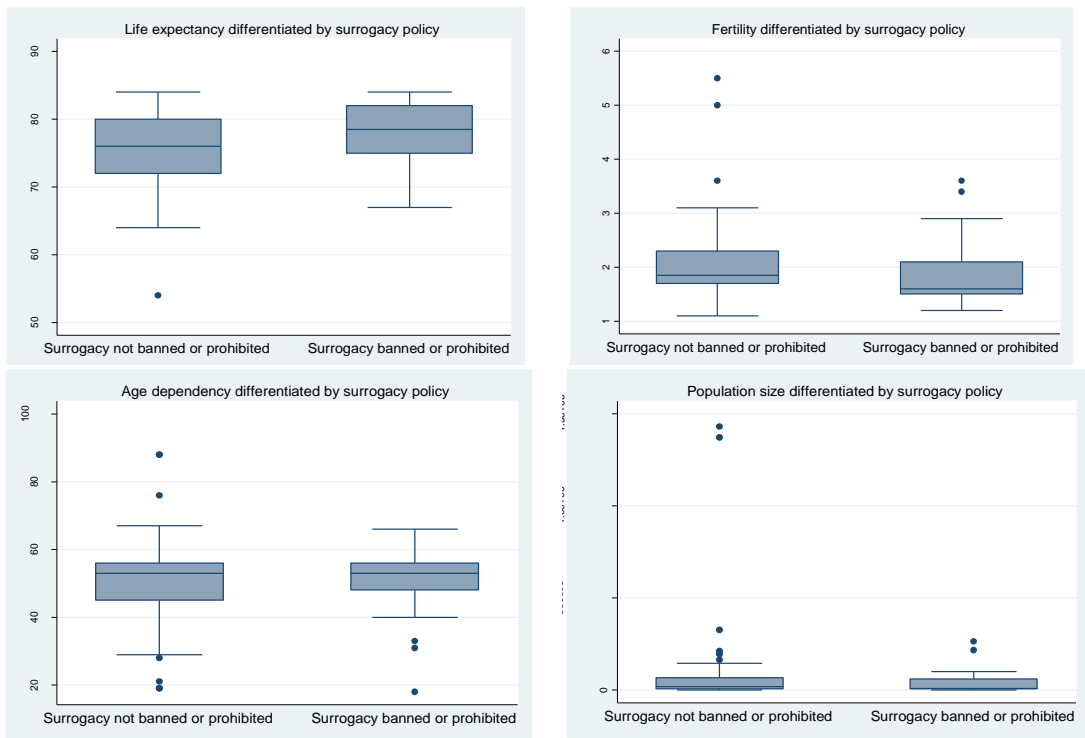


Fig. 11. Differences in age dependency, fertility, population size and life expectancy depending on surrogacy policy

Source: Author

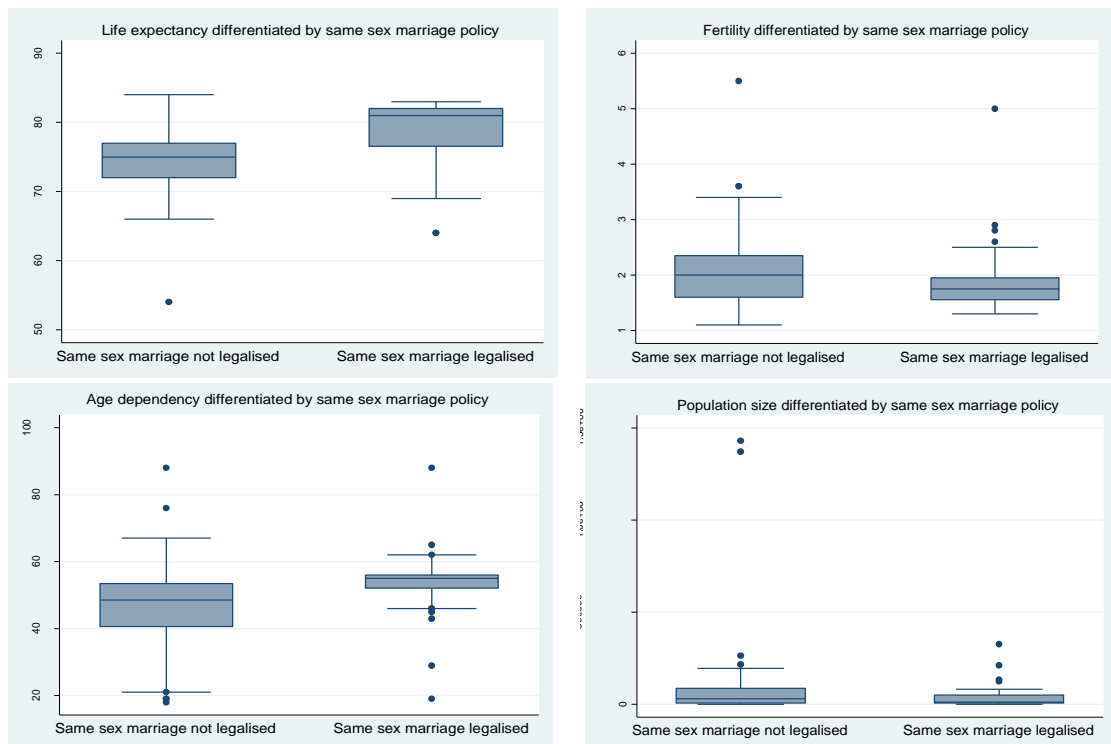


Fig. 12. Differences in age dependency, fertility, population size and life expectancy depending on same-sex marriage policy

Source: Author

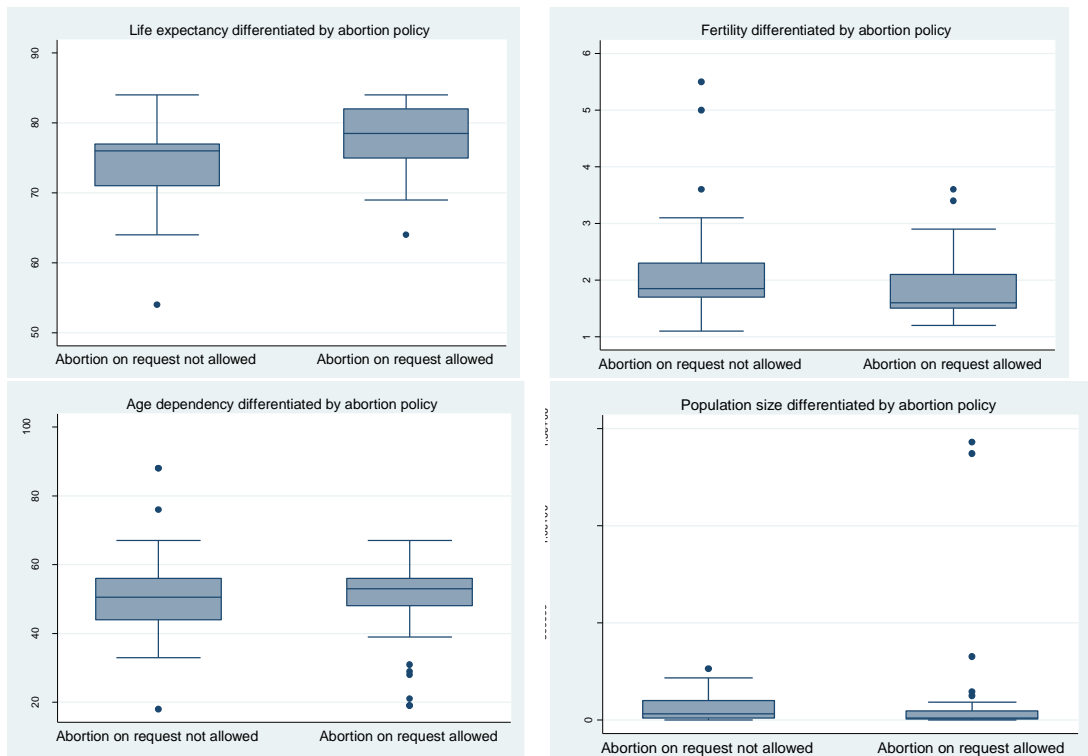


Fig. 13. Differences in age dependency, fertility, population size and life expectancy depending on abortion policy
 Source: Author

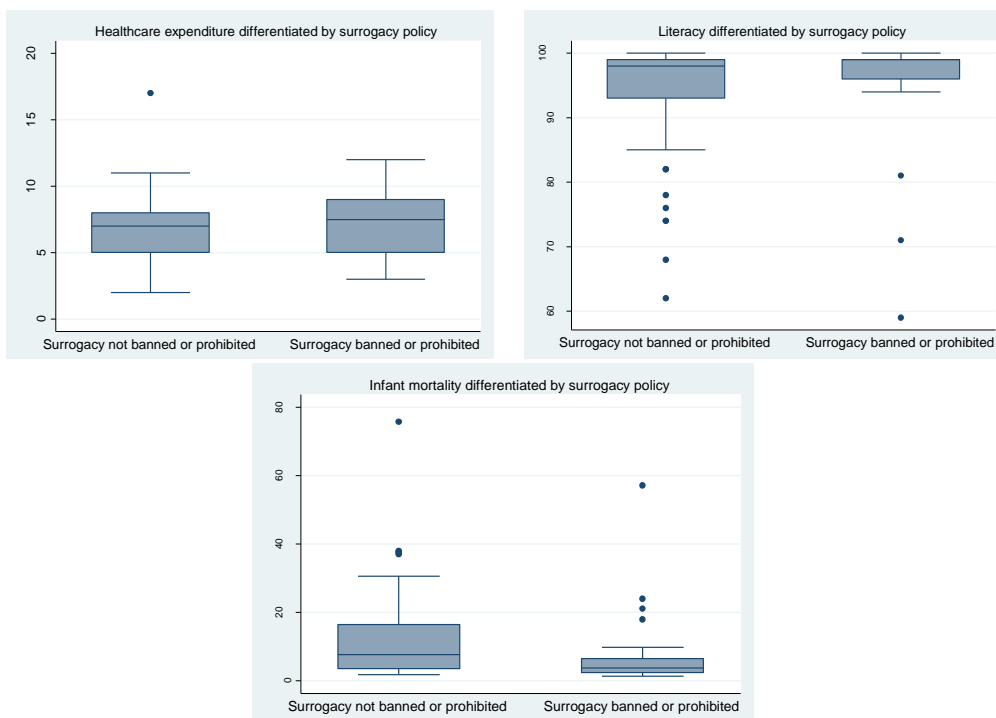


Fig. 14. Differences in healthcare expenditure, literacy and infant mortality depending on surrogacy policy
 Source: Author

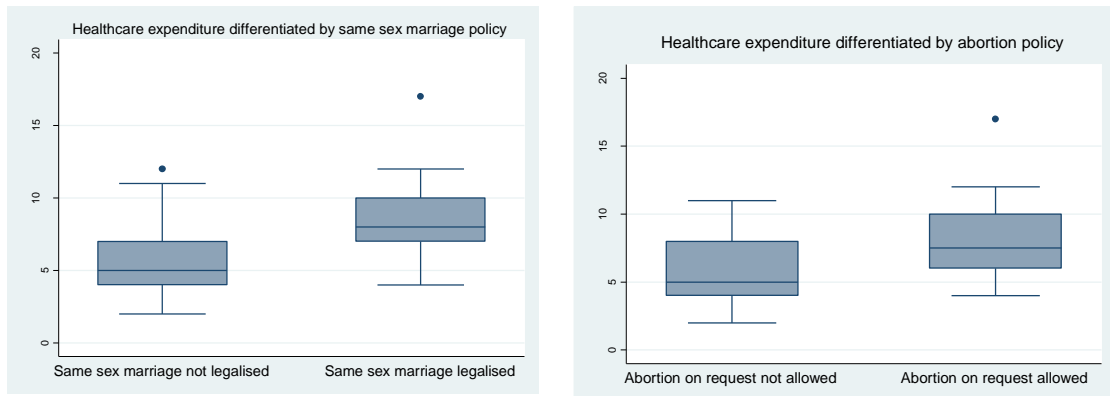


Fig. 15. Differences in healthcare expenditure depending on abortion and same-sex marriage policy
 Source: Author

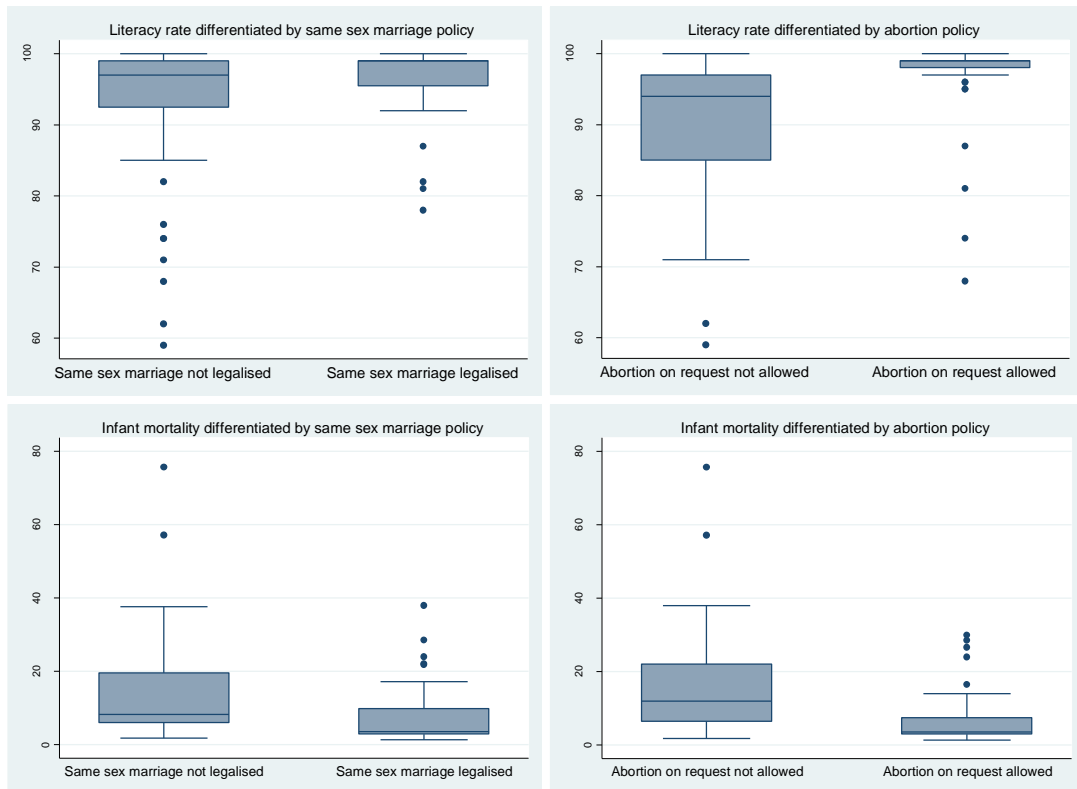


Fig. 16. Differences in literacy and infant mortality depending on abortion and same-sex marriage policy
 Source: Author

Countries that legally recognised same-sex marriage were also more likely to have higher GDP ($z = -3.600$, $p = 0.0003$) and average monthly income ($z = -2.853$, $p = 0.0043$) compared with those that did not recognise same-sex marriage (Figure 19). Logistic regression models also confirmed that GDP and average monthly income were statistically significant predictors of whether or not a country allowed abortions on request (LR $\chi^2(2) = 20.52$, $p = 0.0000$) and whether or not a country legally

recognised same-sex marriage (LR $\chi^2(2) = 18.98$, $p = 0.0001$).

3.9 Grouping Countries Based on Social Policies

When countries were grouped by a combination of their abortion, same-sex marriage and surrogacy policies (Table 4), significant differences in fertility, age dependency ratios, and life expectancy between

groups were observed (Fig. 20). No difference was observed in population size between groups.

3.9.1 Comparison of fertility, life expectancy and age dependency between groups

Fertility rates differed significantly between countries that prohibited surrogacy, recognised same-sex marriage legally and allowed for abortion on request (Group 1) and those that did not recognise same-sex marriage, did not allow for abortion on request and did not have prohibitions against surrogacy (Group 8) ($\chi^2(6) = 19.765, p=0.003$). Fertility rates were significantly higher in the latter group (Group 8). High fertility rates were noted amongst groups 5, 6 and 8, all of which did not allow abortions on request. The lowest fertility rate was noted to be in Group 3 (countries that allowed abortion on request, prohibited surrogacy but had not legalised same-sex marriage). Differences in life expectancy were also observed, with significantly higher life expectancy in Groups 1, 3 and 4 compared to Groups 5, 6, 7 and 8 ($\chi^2(6) = 25.891, p=0.0002$). Interestingly, more countries in the former (Groups 1, 3 and 4) banned or prohibited

surrogacy compared with countries in the latter (Groups 5, 6, 7 and 8). Similar to fertility and life expectancy, age dependency ratios were also significantly different between groups, with the largest difference between Group 6 and Groups 3 and 5 ($\chi^2(6) = 12.940, p=0.044$).

3.9.2 Comparison of infant mortality, literacy and healthcare expenditure between groups

When examining the relationship between infant mortality, literacy and healthcare expenditure with countries grouped by surrogacy, abortion and same-sex marriage policies (Table 4), all three factors were found to be associated with significant differences between groups (Fig. 21).

Difference in infant mortality was widest between countries that did not recognise same-sex marriage, did not allow for abortion on request and did not have prohibitions against surrogacy (Group 8) and countries that prohibited surrogacy, recognised same-sex marriage legally and allowed for abortion on request (Group 1), with Group 8 having a

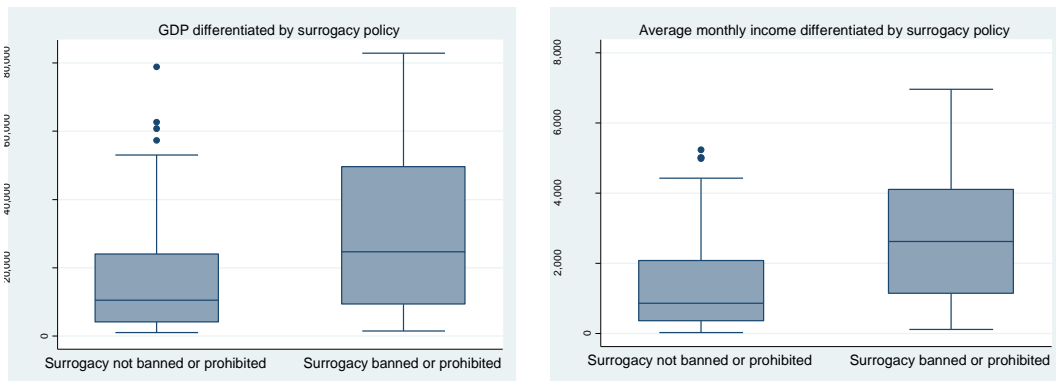


Fig. 17. Differences in GDP and average monthly income depending on surrogacy policy
Source: Author

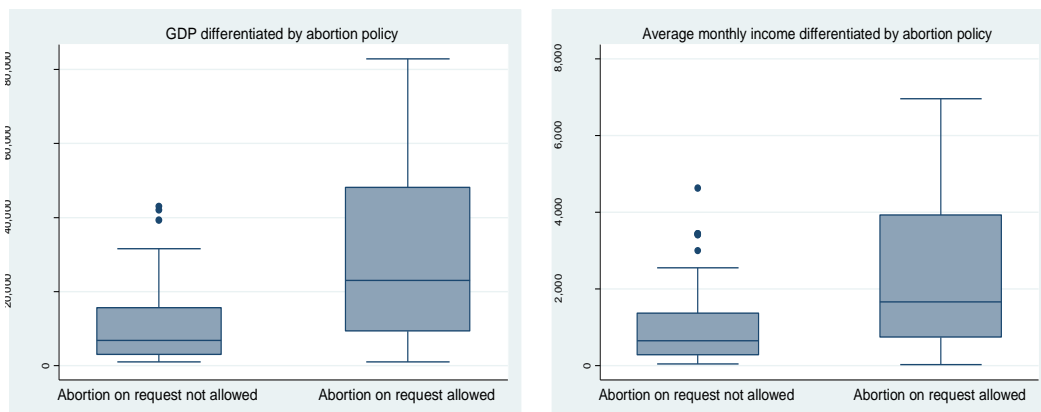


Fig. 18. Differences in GDP and average monthly income depending on abortion policy
Source: Author

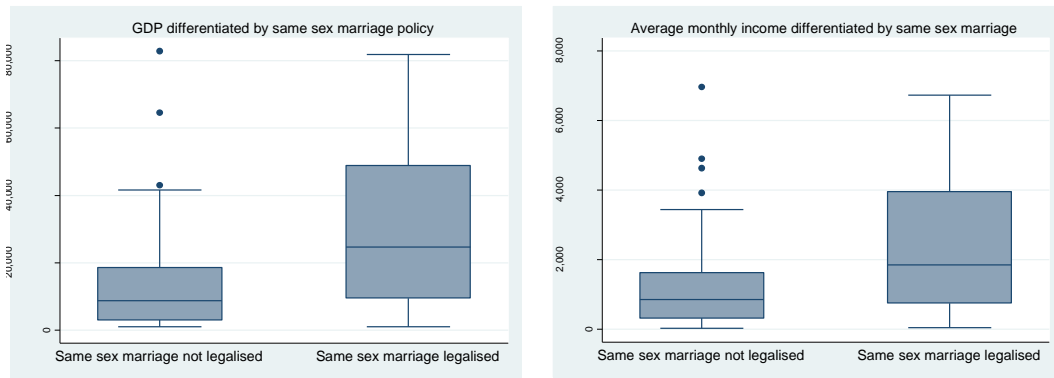


Fig. 19. Differences in GDP and average monthly income depending on same-sex marriage policy
 Source: Author

Table 4. Reference table for groups based on combination of abortion, same-sex marriage and surrogacy policies

Groups	Ban or prohibition on surrogacy	Legalised same-sex marriage	Abortion available on request	No. of countries (%)	Key points
1	Y	Y	Y	14 (16.7)	Economically established countries with liberal social policies but with concerns about surrogacy policy e.g. France, Finland
2	Y	Y	N	0 (0)	No countries fall in this group
3	Y	N	Y	4 (4.8)	Economically established countries with more conservative social policies including surrogacy policy e.g. Switzerland, Singapore
4	N	Y	Y	15 (17.9)	Economically established countries with most liberal social policies including surrogacy policy e.g. Australia, UK, US
5	Y	N	N	8 (9.5)	Less affluent countries with most conservative social policies including surrogacy policy e.g. Egypt, UAE
6	N	Y	N	11 (13.1)	Less affluent countries with conservative abortion policy but liberal surrogacy and same-sex marriage policy. e.g. Brazil, Argentina
7	N	N	Y	17 (20.2)	Less affluent countries with conservative social policies but liberal surrogacy policy. e.g. Ukraine, Russia
8	N	N	N	15 (17.9)	Less affluent countries with extremely conservative social policies and with no explicit policy on surrogacy e.g. Sri Lanka, Bangladesh

significantly higher infant mortality compared with Group 1 ($\chi^2(6) = 34.266, p=0.0001$). Differences were also observed for literacy ($\chi^2(6) = 29.867, p=0.0001$) and health expenditure ($\chi^2(6) = 37.395, p=0.0001$), with the lowest literacy rates and healthcare expenditure in countries that did not recognise same-

sex marriage, did not allow for abortion on request and did not have prohibitions against surrogacy (Group 8). Similar to differences observed for life expectancy, infant mortality rates and healthcare expenditures were higher in Groups 5, 6, 7 and 8 compared with Groups 1, 3 and 4.

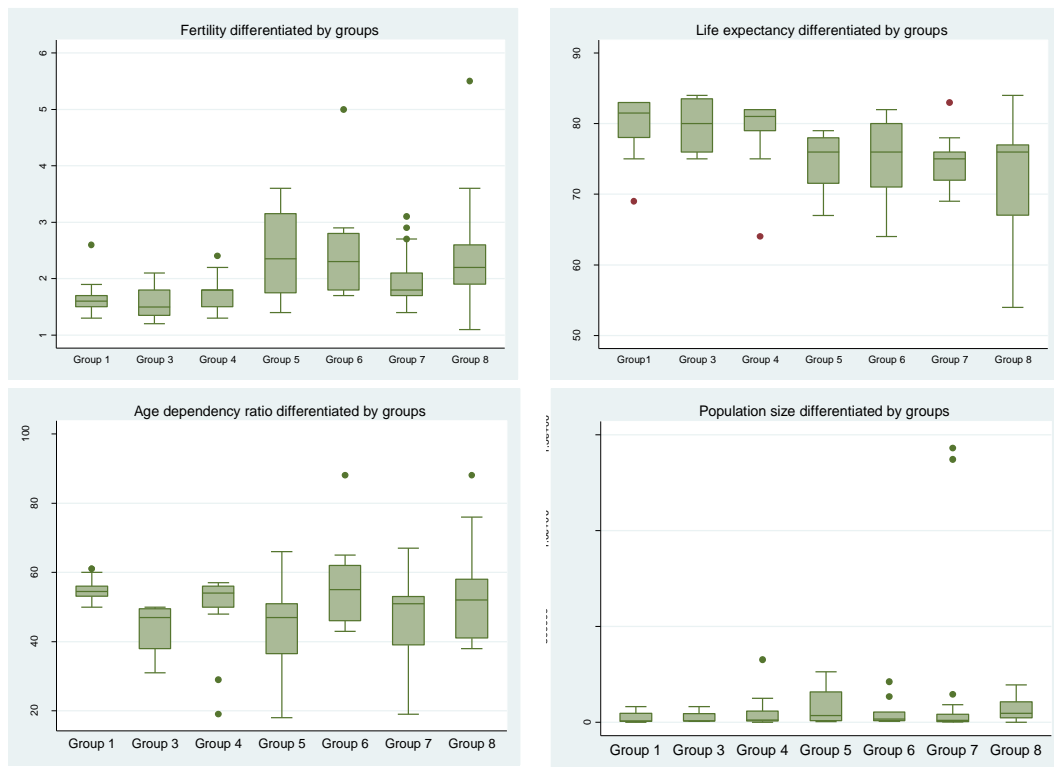


Fig. 20. Differences in age dependency, life expectancy, fertility and population size observed between countries grouped based on policy

Source: Author

3.9.3 Comparison of income and GDP between groups

When the countries were grouped based on surrogacy, abortion and same-sex marriage policy, it was found that there were also significant differences between their GDP and average monthly incomes (Fig. 22). Once again, differences were most marked between countries in Groups 1, 3 and 4 with significantly higher GDP versus countries in Groups 5,6,7 and 8 with much lower GDP ($\chi^2(6) = 31.836, p=0.00$). The same pattern was observed when comparing average monthly income across the groups ($\chi^2(6) = 26.989, p=0.001$).

4. DISCUSSION

This study revealed several interesting findings about a country's surrogacy policy in relation to its economic development and other social policies. Although previous research [1,3,36,37] has suggested that surrogacy was more commonly practiced in affluent societies with advanced medical science and more liberal social policies, the findings of this study have shown that this is not true. Instead, it can be seen that affluent countries were more likely to prohibit surrogacy compared to less affluent ones.

4.1 Low Fertility not Associated with More Liberal Surrogacy Policy

It came as a surprise to discover that countries that had low fertility rates like Singapore and Sweden were more likely to prohibit surrogacy. This was contrary to attempts by these countries to boost birth rates with various measures such as economic rebates, lengthened maternity leave, and enhanced subsidies for ART [17,38]. In contrast, abortion policies tended to be more aligned with fertility rates in countries. In countries that permitted abortions on request, reduced fertility rates were also observed. This made sense as overall lower fertility could be expected from increased efforts to ensure that there were fewer unwanted births.

4.2 Countries that Legalise Same-Sex Marriage not More Receptive to Surrogacy

Although literature on same-sex marriage indicated that gay couples were keen to have their own children and more likely to turn to surrogacy [8,20,39,40], this study showed that countries that had legalised same-sex marriage were also more likely to have prohibited or banned surrogacy. For example, in countries like

Israel and Greece, gay couples could legally register their marriage, yet these couples were denied the opportunity to have genetically related children through surrogacy [20]; This inconsistency between policies created a significant double standard. This seemed to imply unfairly that heterosexual couples were more suitable than gay couples to build families. To exacerbate matters, in some of these countries,

single women were allowed to seek out surrogacy arrangements. This further diminished the rationale behind social arguments that it was in the best interest of the child born from surrogacy to have a whole and intact family unit. The contradictions in these policies highlighted the need for governments to look at social policies more holistically.

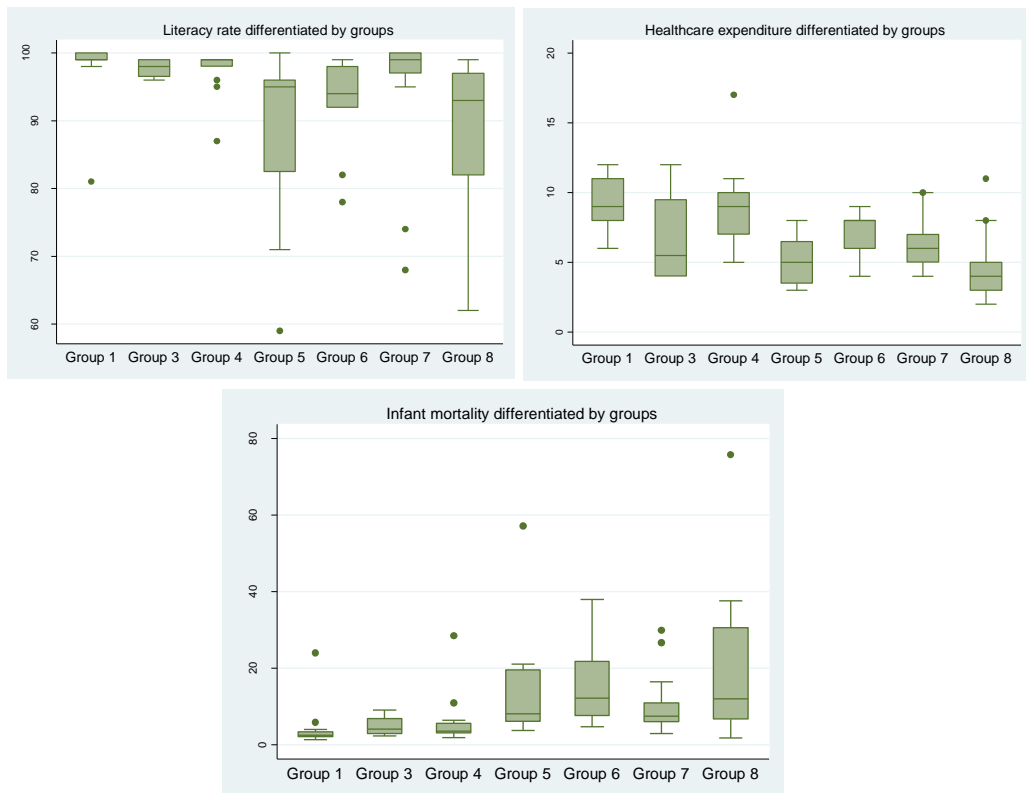


Fig. 21. Differences in literacy, infant mortality and healthcare expenditures observed between countries grouped based on policy

Source: Author

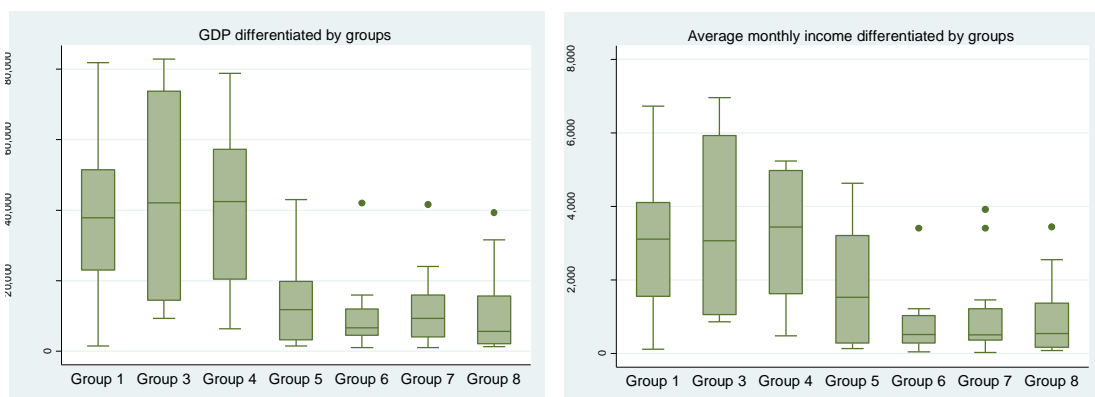


Fig. 22. Differences in GDP and average monthly income observed between countries grouped based on policy

Source: Author

4.3 Better Healthcare and Education does not Translate to More Liberal Surrogacy Policy

The current literature attributes the increased popularity of surrogacy to a variety of factors such as advanced ART techniques, trained and skilful healthcare personnel, and high quality supporting medical infrastructure [1,3]. Yet the findings demonstrate that countries that possess better healthcare systems with lower infant mortality rates are more likely to prohibit surrogacy. This seems counterintuitive since countries with better healthcare systems were more well-equipped to conduct surrogacy safely, and potential concerns about clinical quality and patient safety would not be significant in these countries.

The presence of established and prosperous social systems (reflected by literacy rates and healthcare expenditure) was also thought to be an important contributor to the growth of surrogacy in society [36,37]. However, the findings from this study did not support this as countries that were more liberal in their surrogacy policy were found to have lower literacy rates and lower healthcare expenditure compared to their more conservative counterparts. This was interestingly not the case with abortion and same-sex marriage. Unlike surrogacy, countries that had more liberal abortion and same-sex marriage policies were more likely to have higher literacy rates and higher healthcare expenditure. Evidently, in many countries, surrogacy policy has been treated as a different animal from other social policies.

4.4 Affluent Countries are More Likely to Prohibit Surrogacy

Findings from other studies have reiterated the high cost of surrogacy at both systems and individual level [41]. At a systems level, legalised surrogacy has been documented to involve a whole host of costly measures that only affluent countries can bear. These include surveillance of fertility clinicians and third-party facilitators, resourcing to manage legal disputes between intended parents and surrogate mothers, and comprehensive databases to track transactions [11,42]. Many studies have also highlighted the exorbitant fees for surrogacy [37,41,43]. Yet, evidence from this study showed that affluent countries were more likely to prohibit or ban surrogacy compared to less affluent ones. Ironically, the trend was observed to be inverted in relation to abortion and same-sex marriage policy.

It is possible that affluent countries are more conservative about surrogacy policy compared to other social policies because of concerns about the

downstream social impact of surrogacy. With surrogacy, the social fabric is at higher risk of being disrupted. In studies examining affluent Asian countries, many felt that a ban was necessary to safeguard cultural ideals and to preserve traditional family values and structures [44,45]. Affluent countries may also be more aware than less affluent countries about the safeguards that need to be put in place for surrogacy, and hence be more reluctant to allow for the practice [46,47]. Lobbying power of women's rights and children's rights in affluent countries is also stronger possibly because there is the luxury of time and money to champion ideological causes. Many governments of affluent countries are also cognisant that such issues have significant political mileage and have used surrogacy prohibition to frame their political agenda [18,45,48,49,50]. For less affluent countries, allowing surrogacy may be a conscious economic decision. In these countries, surrogacy may substantially reduce poverty. Opportunities to act as surrogates are welcomed by impoverished and uneducated females as a means to obtain additional income [51,52,53]. The business of surrogacy provides these women and their families with a stable income, which they would not otherwise be able to find in other industries.

4.5 Transnational Surrogacy as a Solution to Conservative Surrogacy Policy

The results of this study also go some way towards explaining the findings of other surrogacy related research. Much of the research relating to surrogacy addresses transnational surrogacy arrangements. This study has shown that affluent countries are banning surrogacy. Yet, other studies have indicated that the demand for surrogacy services in these countries particularly amongst same-sex couples, infertile heterosexual couples and affluent career-focused females remains unchanged [17,54,55]. Based on research on transnational surrogacy, it appears that many of these intended parents are exploring surrogacy in other jurisdictions that do not prohibit or ban surrogacy.

This option has become increasingly popular due to cost disparities created by different economies of affluent and poor countries as illustrated by this study findings. In affluent countries intended parents are likely to find the relatively low cost of surrogacy in less affluent countries enticing. At the same time, surrogate mothers in less affluent countries view the amount that intended parents were willing to pay as extremely profitable. Profit margins have often been further enhanced by differences in currency, creating a self-sustaining demand and supply relationship in overseas surrogacy markets. This has culminated in

much of today's surrogacy research on cross-border surrogacy contracts [56,57,58].

There are several limitations of this study that may prevent its results from being fully representative of surrogacy policy globally. First, the selection of countries based on web search interest was limited to searches made in the English language. As a result, the countries identified as having high interest in surrogacy may not be comprehensive as web searches in other languages may have yielded other search locations and expanded the list of countries for study. Further, with the increasingly widespread use of virtual private networks (VPNs), the accuracy of search locations based on accessed servers may be confounded. This would be especially so in countries where topics like surrogacy or ART are seen as taboo. To address these discrepancies in language and social factors between countries, it may be useful to further deep-dive and examine surrogacy policy by region or continent.

Second, the indicators of a country's economic development that the study used were not comprehensive. For example, data on manpower, employment and environmental sustainability were not included as part of the indicators due to the lack of global standardisation of these indicators. These additional data points may potentially have provided a different perspective on the relationship between surrogacy policy positions and economic development. It would also have been helpful in shedding light on how surrogacy may impact the economy or how surrogacy may create industry in a country.

Third, there is no comprehensive database on surrogacy policy available for reference as the surrogacy process is still very much shrouded in secrecy. Due to issues regarding the legality of surrogacy, transparent reporting from surrogate mothers, commissioning parents and IVF practitioners is challenging [3,42]. Even in countries that permit surrogacy, existing data is incomplete as both surrogate mothers and couples prefer to remain anonymous and maintain their privacy [17]. Surrogacy policy positions of the countries identified for study were obtained via a search of current literature and government documents. This may not be complete particularly when factoring in limitations of language.

5. CONCLUSION

Many countries have documented difficulties dealing with surrogacy policy. Despite the best efforts of many countries to ban or prohibit surrogacy arrangements such as in Thailand, China and

Singapore, it is apparent that surrogacy has still flourished internationally due to inter-country disparities in healthcare costs and economic statuses. Bearing in mind the global impact of surrogacy, banning or prohibiting surrogacy does not appear to be a sustainable or viable long-term solution. Like abortion previously, overly stringent regulation will only drive the problem underground and into the black market, or overseas to poorer, less developed countries. It is necessary to make a concerted effort to approach surrogacy policy in a holistic and measured way. Too often have we seen governments react to surrogacy with knee jerk responses, hastily putting together prohibitive regulatory mechanisms to appease public outcry or to succumb to political pressure.

Governments of some affluent countries like Germany, Israel and Switzerland have made some effort to ameliorate certain challenges of surrogacy over time by reviewing their surrogacy policies. However, this has still been a slow shuffle forward hindered by frequent political backpedalling. In some countries like Sweden and Portugal, surrogacy policies have remained hung in parliament for a long time and have made minimal progress due to highly divergent views [18,59,60]. More progressive governments in countries like Australia and the United Kingdom have made attempts to liberalise surrogacy by limiting surrogacy to altruistic arrangements. While this has been welcomed by many, the devil is once again in the details of implementation.

Countries may do well to focus on the future of surrogacy, rather than get stubbornly stuck on whether to allow surrogacy. As surrogacy becomes increasingly common internationally, there will be more children born from surrogacy and this in turn will create other issues that countries should be prepared for, regardless of their current surrogacy policy. Given the complex transnational nature of surrogacy transactions and its global repercussions, future research on surrogacy policy should form two key pillars. The first pillar should concentrate on developing a comprehensive and interactive global database on surrogacy and related transactions, so as to provide policy makers worldwide with accurate data for more effective policy making. The second pillar should look at advancing surrogacy research through the use of geospatial tools. The study of geospatial influence on policy would potentially yield interesting outcomes that could further inform future policy making.

CONSENT

It is not applicable.

ETHICAL APPROVAL

It is not applicable.

COMPETING INTERESTS

Author has declared that no competing interests exist.

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