**A systematic review of population-based studies on Lipid profiles in Latin America and the Caribbean**

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# PRISMA 2009 Checklist

|  |  |  |  |
| --- | --- | --- | --- |
| Section/topic | # | Checklist item | Reported on page # |
| TITLE | | |  |
| Title | 1 | Identify the report as a systematic review, meta-analysis, or both. | 01 |
| ABSTRACT | | |  |
| Structured summary | 2 | Provide a structured summary including, as applicable: background; objectives; data sources; study eligibility criteria, participants, and interventions; study appraisal and synthesis methods; results; limitations; conclusions and implications of key findings; systematic review registration number. | 03 |
| INTRODUCTION | | |  |
| Rationale | 3 | Describe the rationale for the review in the context of what is already known. | 04 |
| Objectives | 4 | Provide an explicit statement of questions being addressed with reference to participants, interventions, comparisons, outcomes, and study design (PICOS). | 04 |
| METHODS | | |  |
| Protocol and registration | 5 | Indicate if a review protocol exists, if and where it can be accessed (e.g., Web address), and, if available, provide registration information including registration number. | 05 |
| Eligibility criteria | 6 | Specify study characteristics (e.g., PICOS, length of follow-up) and report characteristics (e.g., years considered, language, publication status) used as criteria for eligibility, giving rationale. | 05 |
| Information sources | 7 | Describe all information sources (e.g., databases with dates of coverage, contact with study authors to identify additional studies) in the search and date last searched. | 05 |
| Search | 8 | Present full electronic search strategy for at least one database, including any limits used, such that it could be repeated. | 06 |
| Study selection | 9 | State the process for selecting studies (i.e., screening, eligibility, included in systematic review, and, if applicable, included in the meta-analysis). | 06 |
| Data collection process | 10 | Describe method of data extraction from reports (e.g., piloted forms, independently, in duplicate) and any processes for obtaining and confirming data from investigators. | 06 |
| Data items | 11 | List and define all variables for which data were sought (e.g., PICOS, funding sources) and any assumptions and simplifications made. | 07 |
| Risk of bias in individual studies | 12 | Describe methods used for assessing risk of bias of individual studies (including specification of whether this was done at the study or outcome level), and how this information is to be used in any data synthesis. | 07 |
| Summary measures | 13 | State the principal summary measures (e.g., risk ratio, difference in means). | 07 |
| Synthesis of results | 14 | Describe the methods of handling data and combining results of studies, if done, including measures of consistency (e.g., I2) for each meta-analysis. | 07 |
| Risk of bias across studies | 15 | Specify any assessment of risk of bias that may affect the cumulative evidence (e.g., publication bias, selective reporting within studies). | NA |
| Additional analyses | 16 | Describe methods of additional analyses (e.g., sensitivity or subgroup analyses, meta-regression), if done, indicating which were pre-specified. | NA |
| RESULTS | | |  |
| Study selection | 17 | Give numbers of studies screened, assessed for eligibility, and included in the review, with reasons for exclusions at each stage, ideally with a flow diagram. | 08 |
| Study characteristics | 18 | For each study, present characteristics for which data were extracted (e.g., study size, PICOS, follow-up period) and provide the citations. | 08 |
| Risk of bias within studies | 19 | Present data on risk of bias of each study and, if available, any outcome level assessment (see item 12). | 10 |
| Results of individual studies | 20 | For all outcomes considered (benefits or harms), present, for each study: (a) simple summary data for each intervention group (b) effect estimates and confidence intervals, ideally with a forest plot. | 08-10 |
| Synthesis of results | 21 | Present results of each meta-analysis done, including confidence intervals and measures of consistency. | 08-10 |
| Risk of bias across studies | 22 | Present results of any assessment of risk of bias across studies (see Item 15). | NA |
| Additional analysis | 23 | Give results of additional analyses, if done (e.g., sensitivity or subgroup analyses, meta-regression [see Item 16]). | NA |
| DISCUSSION | | |  |
| Summary of evidence | 24 | Summarize the main findings including the strength of evidence for each main outcome; consider their relevance to key groups (e.g., healthcare providers, users, and policy makers). | 11 |
| Limitations | 25 | Discuss limitations at study and outcome level (e.g., risk of bias), and at review-level (e.g., incomplete retrieval of identified research, reporting bias). | 12-13 |
| Conclusions | 26 | Provide a general interpretation of the results in the context of other evidence, and implications for future research. | 14 |
| FUNDING | | |  |
| Funding | 27 | Describe sources of funding for the systematic review and other support (e.g., supply of data); role of funders for the systematic review. | 02 |

# Search Terms

## **Ovid (Embase, Medline and Global Health)**

|  |  |
| --- | --- |
| 1 | exp Cholesterol/ |
| 2 | cholesterol.mp. |
| 3 | 1 or 2 |
|  |  |
| 4 | exp Cholesterol, LDL/ |
| 5 | ldl-cholesterol.mp. |
| 6 | low density lipoprotein cholesterol.mp. |
| 7 | 4 or 5 or 6 |
|  |  |
| 8 | exp Cholesterol, HDL/ |
| 9 | hdl-cholesterol.mp. |
| 10 | high density lipoprotein cholesterol.mp. |
| 11 | 8 or 9 or 10 |
|  |  |
| 12 | exp Triglycerides/ |
| 13 | triglycerides.mp. |
| 14 | 12 or 13 |
|  |  |
| 15 | dyslipidemi$.mp. |
| 16 | lipid disorder.mp. |
| 17 | hypercholesterolemia.mp. |
| 18 | hypertriglyceridemia.mp. |
| 19 | hyperlipidemia.mp. |
| 20 | 15 or 16 or 17 or 18 or 19 |
|  |  |
| 21 | 3 or 7 or 11 or 14 or 20 |
|  |  |
| 22 | (("Antigua and Barbuda") or ("Argentina") or ("Bahamas") or ("Barbados") or ("Belize") or ("Bolivia") or ("Brazil") or ("United States Virgin Islands") or ("British Virgin Islands") or ("Chile") or ("Colombia") or ("Costa Rica") or ("Cuba") or ("Dominica") or ("Dominican Republic") or ("Ecuador") or ("El Salvador") or ("Grenada") or ("Guatemala") or ("Guyana") or ("Haiti") or ("Honduras") or ("Jamaica") or ("Mexico") or ("Nicaragua") or ("Panama") or ("Paraguay") or ("Peru") or ("Puerto Rico") or ("Saint Kitts and Nevis") or ("Saint Lucia") or ("Saint Vincent and the Grenadines") or ("Suriname") or ("Trinidad and Tobago") or ("West Indies") or ("Uruguay") or ("Venezuela") or ("Latin America") or latin amer$ or ("South America") or south amer$ or ("Central America") or central amer$ or ("Caribbean Region")) |
|  |  |
| 23 | 21 and 22 |
| 24 | exp animals/ not humans.sh. |
| 25 | 23 not 24 |
| 26 | remove duplicates from 25 |

## **SCOPUS**

(TITLE-ABS-KEY(cholesterol) OR TITLE-ABS-KEY(LDL cholesterol) OR TITLE-ABS-KEY(low density lipoprotein cholesterol) OR TITLE-ABS-KEY(HDL cholesterol) OR TITLE-ABS-KEY(high density lipoprotein cholesterol) OR TITLE-ABS-KEY(triglycerides) OR TITLE-ABS-KEY(dyslipidemi\*) OR TITLE-ABS-KEY(lipid disorder) OR TITLE-ABS-KEY(hypercholesterolemia) OR TITLE-ABS-KEY(hypertriglyceridemia) OR TITLE-ABS-KEY(hyperlipidemia)) AND (TITLE-ABS-KEY("Antigua and Barbuda") or TITLE-ABS-KEY("Argentina") or TITLE-ABS-KEY("Bahamas") or TITLE-ABS-KEY("Barbados") or TITLE-ABS-KEY("Belize") or TITLE-ABS-KEY("Bolivia") or TITLE-ABS-KEY("Brazil") or TITLE-ABS-KEY("United States Virgin Islands") or TITLE-ABS-KEY("British Virgin Islands") or TITLE-ABS-KEY("Chile") or TITLE-ABS-KEY("Colombia") or TITLE-ABS-KEY("Costa Rica") or TITLE-ABS-KEY("Cuba") or TITLE-ABS-KEY("Dominica") or TITLE-ABS-KEY("Dominican Republic") or TITLE-ABS-KEY("Ecuador") or TITLE-ABS-KEY("El Salvador") or TITLE-ABS-KEY("Grenada") or TITLE-ABS-KEY("Guatemala") or TITLE-ABS-KEY("Guyana") or TITLE-ABS-KEY("Haiti") or TITLE-ABS-KEY("Honduras") or TITLE-ABS-KEY("Jamaica") or TITLE-ABS-KEY("Mexico") or TITLE-ABS-KEY("Nicaragua") or TITLE-ABS-KEY("Panama") or TITLE-ABS-KEY("Paraguay") or TITLE-ABS-KEY("Peru") or TITLE-ABS-KEY("Puerto Rico") or TITLE-ABS-KEY("Saint Kitts and Nevis") or TITLE-ABS-KEY("Saint Lucia") or TITLE-ABS-KEY("Saint Vincent and the Grenadines") or TITLE-ABS-KEY("Suriname") or TITLE-ABS-KEY("Trinidad and Tobago") or TITLE-ABS-KEY("West Indies") or TITLE-ABS-KEY("Uruguay") or TITLE-ABS-KEY("Venezuela") or TITLE-ABS-KEY("Latin America") or TITLE-ABS-KEY(latin amer$) or TITLE-ABS-KEY("South America") or TITLE-ABS-KEY(south amer$) or TITLE-ABS-KEY("Central America") or TITLE-ABS-KEY(central amer$) or TITLE-ABS-KEY("Caribbean Region")) NOT DBCOLL(medl) AND  (LIMIT-TO ( DOCTYPE , "ar"))  AND  ( LIMIT-TO(SUBJAREA, "MEDI"))

## **LILACS**

((colesterol) OR (LDL colesterol) OR (lipoproteína de baja densidad) OR (HDL colesterol) OR (lipoproteína de alta densidad) OR (trigliceridos) OR (dislipidemias) OR (hipercolesterolemia) OR (hipertrigliceridemia) OR (hiperlipidemia)) AND(("Antigua y Barbuda") or ("Argentina") or ("Aruba") or ("Bahamas") or ("Barbados") or ("Belice") or ("Bolivia") or ("Brasil") or ("Islas Vírgenes de los Estados Unidos") or ("Islas Vírgenes Británicas") or ("Islas Caimán") or ("Chile") or ("Colombia") or ("Costa Rica") or ("Cuba") or ("Curazao") or ("Dominica") or ("Republica Dominicana") or ("Ecuador") or ("El Salvador") or ("Granada") or ("Guatemala") or ("Guyana") or ("Haití") or ("Honduras") or ("Jamaica") or ("México") or ("Nicaragua") or ("Panamá") or ("Paraguay") or ("Perú") or ("Puerto Rico") or ("San Cristóbal y Nieves ") or ("Santa Lucía") or ("San Vicente y las Granadinas ") or ("Surinam") or ("Trinidad y Tobago") or ("Turcas y Caicos ") or ("Uruguay") or ("Venezuela") or ("América Latina") or ("Latinoamérica") or ("América del Sur") or ("Sudamérica") or ("Suramérica​") or ("América Central") or ("Centroamérica") or ("América del Centro") or ("Caribe"))

# Risk of bias assessment

As described in the main document, we followed the recommendations and tool by Hoy and colleagues.[[1]](#footnote-1) Below we described our rationale for grading each of the ten criteria in the risk of bias (RoB) assessment tool.

The first item in the RoB tool is: *Was the study’s target population a close representation of the national population in relation to relevant variables, e.g. age, sex, occupation?* We considered the selected studies to be “low risk of bias” because we only included population-based studies with random sampling of the general population; also, we excluded studies with one population group alone (e.g., smokers). Whether a community study is a close representation of the country, is of course arguable. However, that study would still be “more representative” than one with a selected or convenience sample. For this item the possible outcomes were “low risk of bias” and “high risk of bias”. We considered our selected studies as “low risk of bias” because even when they were not national surveys, they may still be representative or informative of the general population.

The second item in the RoB tool is: *Was the sampling frame a true or close representation of the target population?* We followed a similar logic as above. Because of the study design -population-based with random sampling- we considered that all selected studies were a true (in the case of national surveys or studies in multiple cities) or close representation (in the case of small studies conducted in a limited area) of the target population. Studies were deemed as “low risk of bias”.

The third item in the RoB tool is: *Was some form of random selection used to select the sample, OR, was a census undertaken?* As with the two first items, our inclusion criteria already prevented us from having studies with no random selection of the study population. Studies were regarded as “low risk of bias”.

The fourth item in the RoB tool is: *Was the likelihood of non-response bias minimal?* Following the recommendations by the RoB tool, some studies did not meet the threshold for “low risk of bias” with regards to the response rate. When evidence was available, reports were classified as low or high risk of bias.

The fifth item in the RoB tool is: *Were data collected directly from the subjects (as opposed to a proxy)?* All studies were deemed as “low risk of bias” in this item because of our selection criteria. We only included studies with direct measurement of any lipid biomarkers. This, by definition, implies that data were collected directly from the subjects.

The sixth item in the RoB tool is: *Was an acceptable case definition used in the study?* Half of our work was about mean levels of lipid biomarkers. As these were numeric variables, there is no case definition. The other half of our work was about prevalence estimates of dyslipidaemia traits. Here, not all studies used the same case definitions, and there could be potential explanations: i) case definitions have changed over the years, and old studies may have adhered to recommendations available at the time; ii) rather than using international recommendations, some studies used local guidelines; and iii) some studies used a different definition (e.g., percentiles) based on their research question. Regardless of these potential issues, the case definition in the original study was not “wrong”; these were just different yet accurate within their time period, geographic scope and aims. Studies were classified as “low risk of bias”. Finally, regarding our pooled prevalence estimates (see Table 1 in the main document), only consistent definitions were pooled.

The seventh item in the RoB tool is: *Was the study instrument that measured the parameter of interest (e.g .prevalence of low back pain) shown to have reliability and validity (if necessary)?* We considered studies met criteria for “low risk of bias” because they all measured lipid biomarkers, which is a reliable source of information. Information was not self-reported o gathered from other written sources.

The eighth item in the RoB tool is: *Was the same mode of data collection used for all subjects?* The methodology followed by the epidemiological studies of interest, requires a consistent protocol for all subjects. Data and blood samples collection, as well as laboratory procedures, were consistent for all subjects. We considered studies as “low risk of bias”.

The ninth item in the RoB tool is: *Was the length of the shortest prevalence period for the parameter of Interest appropriate?* We were interested in the point prevalence of dyslipidaemia traits; that is, the prevalence at the time of data collation. Studies met these criteria, thus classified as “low risk of bias”. This item would not apply for mean levels.

The tenth item in the RoB tool is: *Were the numerator(s) and denominator(s) for the parameter of interest appropriate?* For our research question, the numerator and denominator were adequate; for example, number of people with high total cholesterol over the total study population. Consequently, we thought all studies were “low risk of bias”.

Finally, the overall summary proposed by this RoB tool has three options: *i) low risk of bias when further research is very unlikely to change our confidence in the estimate; ii) moderate risk of bias when further research is likely to have an important impact on our confidence in the estimate and may change the estimate; and iii) high risk of bias when further research is very likely to have an important impact on our confidence in the estimate and is likely to change the estimate.* Because most -if not all- studies were “low risk of bias” in most items, but we cannot guarantee studies were completely free risk of bias, we deemed all studies as “moderate risk of bias”. In some cases, further research could change our confidence in the estimates, but still, we would not expect the estimates to change dramatically. This because we sought population-based studies with random sampling of the general population, and where lipid biomarkers were measured with laboratory-based methods.

A limitation of our methodology is that we assessed the RoB based on the information available in each selected report (or paper), which may not contain all details to make a comprehensive assessment of the original study. Ideally, we would have needed to investigate the original protocol, but certainly this does not happen often in any systematic review. Moreover, because of our original selection criteria, we strongly consider that the selected reports do not provide biased information to affect our results or conclusions.

# Supplementary Table 1: Characteristics of the analysed studies (197 studies)

NI: no information

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Country** | **1st author** | **Publication year** | **Data collection year** | **Overall sample size** | **Men (%)** | **Age (mean)** | **Coverage** | **Fasting** |
| Argentina | Vinueza1 | 2010 | 2004 | 1412 |  |  | Community | Yes |
| Argentina | Salazar2 | 2013 | 2003 | 926 | 32.83 | 51.42 | Community | Yes |
| Argentina | Rubinstein3 | 2015 | 2011 | 3990 |  |  | Community | Yes |
| Argentina | Salazar4 | 2009 | 2007 | 892 | 28.59 | 40 | Community | Yes |
| Argentina | Carbajal5 | 2001 |  | 1523 | 36.51 |  | Community | Yes |
| Argentina | Schneider6 | 2006 | 2001 | 107 | 0 |  | Community | Yes |
| Argentina | Ferrante7 | 2007 | 2005 | 41392 | 47.5 |  | National | NI |
| Argentina | Redruello8 | 2008 | 2007 | 522 | 41 | 48.7 | Community | NI |
| Argentina | Ferrante9 | 2011 | 2009 | 34372 |  |  | National | NI |
| Barbados | Howitt10 | 2015 | 2012 | 1234 | 38.09 |  | National | Yes |
| Belize | Wong-McClure11 | 2015 | 2005 | 1520 | 35.4 |  | National | Yes |
| Brazil | Velasquez-Melendez12 | 1999 | 1991 | 951 | 40.69 |  | Community | Yes |
| Brazil | Pereira13 | 2006 | 2000 | 1577 | 45.57 | 44.79 | Community | Yes |
| Brazil | Poletto14 | 1992 | 1989 | 238 | 100 |  | Community | Yes |
| Brazil | Rigo15 | 2008 | 2005 | 378 | 33.33 | 68.5 | Community | Yes |
| Brazil | Sesso16 | 2008 | 1992 | 269 | 45.7 |  | Community | NI |
| Brazil | Pimenta17 | 2013 | 2005 | 280 | 50.6 |  | Community | Yes |
| Brazil | Quintino-Santos18 | 2012 | 1996 | 1408 | 39.6 | 69 | Community | NI |
| Brazil | Togeiro19 | 2013 | 2007 | 1042 |  |  | Community | Yes |
| Brazil | Ota 20 | 2011 | 2001 | 382 | 31.68 | 79.82 | Community | Yes |
| Brazil | Pimenta21 | 2007 | 2001 | 287 | 48.4 |  | Community | Yes |
| Brazil | Souza22 | 2003 | 2001 | 1039 | 47.8 | 48.8 | Community | Yes |
| Brazil | Yokota23 | 2012 | 2010 | 869 | 45.1 |  | Community | Yes |
| Brazil | Petris24 | 2016 | 2011 | 967 | 45.5 |  | Community | NI |
| Brazil | Pirkle25 | 2018 | 2012 | 311 | 49.2 | 69 | Community | NI |
| Brazil | Werle26 | 2011 | 1994 | 187 | 36.4 | 83.6 | National | Yes |
| Brazil | Oliveira27 | 2012 | 2006 | 517 | 0 | 29 | Community | Yes |
| Brazil | Venturini28 | 2013 | 2006 | 304 | 28.6 |  | Community | NI |
| Brazil | Pavan29 | 1997 |  | 370 |  |  | Community | NI |
| Brazil | Roriz-Cruz30 | 2007 |  | 422 | 35.2 | 68.3 | Community | NI |
| Brazil | Neumann31 | 2007 | 2001 | 2277 | 45.7 |  | Community | Yes |
| Brazil | Nunes Filho32 | 2007 | 2006 | 353 | 49.3 | 40.4 | Community | Yes |
| Brazil | Gimeno33 | 2011 | 2006 | 930 |  | 42.42 | Community | Yes |
| Brazil | Moraes34 | 2012 | 2007 | 2471 | 40.3 | 47.1 | Community | Yes |
| Brazil | Garcez35 | 2014 | 2008 | 299 | 48.2 |  | Community | Yes |
| Brazil | Garcez35 | 2014 | 2008 | 263 | 47.1 |  | Community | Yes |
| Brazil | Gomes36 | 2013 | 2010 | 113 | 35.4 | 82.77 | Community | Yes |
| Brazil | Kaestner37 | 2017 | 2014 | 38069 | 40.1 | 14.6 | National | Yes |
| Brazil | Fortanelli38 | 2018 | 2015 | 901 | 51.6 |  | Community | Yes |
| Brazil | Marquezine39 | 2008 |  | 1561 | 45.48 |  | Community | Yes |
| Brazil | Mendes-Lana40 | 2007 |  | 185 |  | 53.82 | Community | NI |
| Brazil | Pena41 | 2016 | 2009 | 931 | 45.6 | 45.09 | Community | Yes |
| Brazil | Bieleman42 | 2014 | 1982 | 1918 |  |  | Community | No |
| Brazil | Cardoso43 | 2002 | 1991 | 1067 | 40.7 | 39.8 | Community | NI |
| Brazil | Buffarini44 | 2018 | 1993 | 917 | 47.76 | 18.5 | Community | No |
| Brazil | De Oliveira45 | 2010 | 1999 | 1461 | 46.4 | 44.8 | Community | Yes |
| Brazil | Martins46 | 1989 | 1987 | 279 |  |  | Community | Yes |
| Brazil | Fornes47 | 2000 | 1990 | 1328 | 41.15 |  | Community | Yes |
| Brazil | Martins48 | 1996 | 1991 | 1049 | 41.11 |  | Community | Yes |
| Brazil | Correa Leite49 | 2013 | 1997 | 1407 | 39.5 | 69.1 | Community | Yes |
| Brazil | Gus50 | 2002 | 2000 | 1066 | 48.2 |  | Community | Yes |
| Brazil | Marcopito51 | 2005 | 2001 | 2103 | 43.71 |  | Community | Yes |
| Brazil | de Oliveira52 | 2008 | 2006 | 1666 | 43.4 | 44 | Community | Yes |
| Brazil | de Castro53 | 2015 | 2009 | 462 | 38.53 | 53.9 | Community | Yes |
| Brazil | de Souza54 | 2016 | 2009 | 281 | 37.7 | 39.8 | Sub-national | Yes |
| Brazil | Drumond55 | 2011 | 2009 | 382 | 48.17 |  | Community | Yes |
| Brazil | Mendes56 | 2014 | 2009 | 881 | 45.74 |  | Sub-national | Yes |
| Brazil | Castro57 | 2016 | 2010 | 417 | 39 | 54 | Sub-national | Yes |
| Brazil | Cocate58 | 2013 | 2011 | 299 | 100 | 50.5 | Community | Yes |
| Brazil | Costa-Fagundes59 | 2018 | 2011 | 316 | 45.3 | 74.22 | Community | Yes |
| Brazil | Barbosa60 | 2016 | 2012 | 968 | 38 | 22.63 | Community | Yes |
| Brazil | Bernardi61 | 2015 | 2003 | 2063 | 48.23 | 23.9 | Community | Yes |
| Brazil | Candido62 | 2007 |  | 400 | 26.5 | 45.17 | Community | Yes |
| Brazil | de Oliveira63 | 2012 |  | 1032 | 45.77 | 43.04 | National | Yes |
| Brazil | de Oliveira64 | 2013 |  | 2003 | 46.43 | 42.54 | Community | Yes |
| Brazil | de Oliveira65 | 2017 |  | 1662 | 45.78 | 44.75 | Community | Yes |
| Brazil | Dressler66 | 2006 |  | 258 | 38.8 | 40.9 | Community | Yes |
| Brazil | Beleigoli67 | 2017 | 2000 | 1138 | 36.9 | 68 | Community | Yes |
| Brazil | Bustos68 | 2007 | 2002 | 2063 | 48.2 | 23.9 | Community | Yes |
| Brazil | Costa69 | 2010 | 2004 | 3123 |  |  | National | NI |
| Brazil | Carnelosso70 | 2010 | 2004 | 3275 | 39.1 | 42 | Community | NI |
| Brazil | Cabral71 | 2015 | 2013 | 959 | 49.2 |  | Community | Yes |
| Brazil | Matos72 | 2003 |  | 160 | 43.7 | 46.6 | Community | Yes |
| Chile | Jadue73 | 1999 | 1997 | 1669 | 26.43 |  | Community | Yes |
| Chile | Garcia Hermozo74 | 2017 | 2009 | 2472 | 41.4 | 46 | Sub-national | Yes |
| Chile | Vinueza1 | 2010 | 2004 | 1605 |  |  | Community | Yes |
| Chile | Palomo75 | 2007 | 2005 | 1007 | 33.7 | 45.16 | Community | Yes |
| Chile | Tejos76 | 2013 | 2010 | 2794 | 48.9 | 41.7 | National | Yes |
| Chile | Villanueva77 | 2018 | 2010 | 5248 | 40.62 | 41.57 | National | Yes |
| Chile | Rubinstein3 | 2015 | 2011 | 1950 |  |  | Community | Yes |
| Chile | Lanas78 | 2016 | 2009 | 5416 | 40.62 | 46.69 | National | NI |
| Chile | Lara79 | 2012 |  | 999 | 43.7 | 24.8 | Community | Yes |
| Chile | Mena80 | 2015 |  | 832 | 33.3 | 45 | Community | NI |
| Chile | Miquel81 | 1998 |  | 1991 | 40.5 | 40.9 | Community | NI |
| Chile | Mujica82 | 2008 |  | 1007 | 33.7 | 45.2 | Community | Yes |
| Chile | Valenzuela83 | 2010 | 2003 | 1883 | 44.24 |  | National | Yes |
| Chile | Group I multicentre collaborative 84 | 1992 | 1989 | 199 | 100 | 45.5 | Community | NI |
| Chile | Cuevas85 | 2008 | 1997 | 964 | 34.85 | 40.1 | Community | Yes |
| Chile | Pivatto86 | 2007 | 2001 | 998 | 43.7 | 24.8 | Community | Yes |
| Chile | Amigo87 | 2010 | 2002 | 999 | 43.74 |  | Community | Yes |
| Chile | Labrana88 | 2017 | 2009 | 5157 | 40.6 | 40.26 | National | Yes |
| Chile | Acevedo89 | 2009 | 2007 | 999 | 50.85 | 43.8 | Community | Yes |
| Chile | Acevedo90 | 2012 | 2005 | 1624 | 47.41 | 45 | Community | Yes |
| Chile | Berrios91 | 1997 | 1988 | 521 | 35.5 | 40 | Community | NI |
| Colombia | Roldan-Menco92 | 2017 |  | 302 | 41 | 51 | Community | Yes |
| Colombia | Pirkle25 | 2018 | 2012 | 374 | 49.2 | 69 | Community | NI |
| Colombia | Arbey93 | 2011 |  | 61 | 100 | 47.1 | Community | NI |
| Colombia | Patino-Villada94 | 2011 | 2009 | 357 | 39.78 |  | Community | Yes |
| Colombia | Camacho95 | 2018 | 2006 | 6628 | 35.9 | 50.7 | National | Yes |
| Colombia | Vinueza1 | 2010 | 2004 | 1511 |  |  | Community | Yes |
| Colombia | Palmett-Rios96 | 2017 | 2011 | 1300 | 30.6 | 40.6 | Sub-national | NI |
| Colombia | Bautista97 | 2006 | 2001 | 2989 | 35.76 | 35.1 | Community | No |
| Colombia | Gallo98 | 2013 | 2007 | 800 | 44.8 | 50.3 | Community | Yes |
| Colombia | Alayon99 | 2010 | 2008 | 207 | 28 | 33.5 | Community | Yes |
| Costa Rica | Campos100 | 1991 | 1988 | 465 | 47.74 |  | Community | Yes |
| Costa Rica | Wong-McClure11 | 2015 | 2005 | 1050 | 38.1 |  | Community | Yes |
| Costa Rica | Holst101 | 2006 | 2001 | 400 | 47 | 32.5 | Community | Yes |
| Costa Rica | Chanti-Ketterl102 | 2017 | 2005 | 2677 | 46 | 70.5 | National | Yes |
| Costa Rica | Campos100 | 1991 | 1988 | 376 | 53.72 | 40.47 | Community | Yes |
| Costa Rica | Rehkopf103 | 2018 | 2005 | 2827 | 47.01 |  | National | NI |
| Costa Rica | Jimenez104 | 1987 | 1982 | 2054 | 45.96 |  | National | Yes |
| Costa Rica | Goldman105 | 2011 | 2005 | 2827 | 53.7 |  | National | Yes |
| Costa Rica | Williams106 | 2007 | 1996 | 484 | 73.46 | 57.18 | Community | NI |
| Cuba | Salas107 | 2016 | 2004 | 2944 | 35 | 75.1 | Community | Yes |
| Cuba | Nordet108 | 2013 | 2009 | 1287 | 35.1 | 54.9 | Community | Yes |
| Dominica | Robinson109 | 2004 |  | 211 | 35 | 34.9 | National | NI |
| Dominican Republic | Aono110 | 1999 | 1993 | 1893 | 40.09 | 36.3 | National | NI |
| Dominican Republic | Salas107 | 2016 | 2005 | 2011 | 34.1 | 75.3 | Community | Yes |
| Dominican Republic | Dong111 | 2011 | 1997 | 1211 | 39 | 44.1 | Community | Yes |
| Ecuador | Encalada-Torres112 | 2017 | 2015 | 387 | 36.43 | 72.89 | Community | Yes |
| Ecuador | Vinueza1 | 2010 | 2004 | 1620 |  |  | Community | Yes |
| Ecuador | Orces113 | 2017 | 2010 | 2053 | 46.76 |  | National | Yes |
| Ecuador | Sisa114 | 2018 | 2010 | 1307 | 46.37 | 75 | National | Yes |
| El Salvador | Orantes115 | 2011 | 2009 | 775 | 44.26 | 39.2 | Community | Yes |
| Granada | Bansilal116 | 2012 | 2009 | 2827 | 42.48 |  | National | Yes |
| Guatemala | Wong-McClure11 | 2015 | 2005 | 904 | 26 |  | Community | Yes |
| Guatemala | Romero-Abal117 | 1994 |  | 107 | 26 | 69 | Community | Yes |
| Guatemala | Gregory118 | 2009 | 1998 | 376 | 48.14 | 24.45 | Community | Yes |
| Haiti | DeGennaro119 | 2018 | 2016 | 2131 | 38.9 | 40.8 | Community | NI |
| Honduras | Wong-McClure11 | 2015 | 2005 | 1124 | 30.3 |  | Community | Yes |
| Honduras | Hall Marti­nez120 | 2005 | 2003 | 246 | 42.3 | 48.21 | Community | Yes |
| Jamaica | Ferguson121 | 2017 | 2007 | 2231 | 30.39 | 39.4 | National | Yes |
| Jamaica | Gupta122 | 2010 | 1996 | 1466 | 41.47 | 45.9 | Community | Yes |
| Jamaica | Florey123 | 1973 |  | 696 | 33.9 |  | Community | Yes |
| Jamaica | Ferguson124 | 2008 | 2001 | 1972 | 33.52 | 36.3 | National | Yes |
| Jamaica | Ferguson125 | 2010 | 2006 | 839 | 45.05 | 18.78 | National | Yes |
| Jamaica | Tulloch-Reid126 | 2013 | 2008 | 1432 | 31.42 |  | National | Yes |
| Jamaica | Stringhini127 | 2016 | 2011 | 386 | 38.2 | 34.5 | Community | Yes |
| Mexico | Ramirez-Lopez128 | 2005 | 2003 | 360 |  | 8.54 | Community | Yes |
| Mexico | Vinueza1 | 2010 | 2004 | 1677 |  |  | Community | Yes |
| Mexico | Rosas-Saucedo129 | 2009 |  | 608 |  |  | Community | Yes |
| Mexico | Sanchez-Corona130 | 2004 |  | 163 | 41.1 | 31.7 | Community | NI |
| Mexico | Aguilar-Salinas131 | 2002 | 1993 | 14069 | 40.64 | 30.37 | National | Yes |
| Mexico | Aguilar-Salinas132 | 2011 | 2000 | 1729 |  | 36.8 | National | Yes |
| Mexico | Escobedo de la Peña133 | 2014 | 2004 | 1722 | 48.37 |  | Sub-national | Yes |
| Mexico | Echevarri­a-Pinto134 | 2006 | 2005 | 73 | 42.46 |  | Community | Yes |
| Mexico | Salas107 | 2016 | 2007 | 2003 | 36.69 | 74.77 | Community | Yes |
| Mexico | Rodriguez-Moran135 | 2001 |  | 210 | 34.76 | 40.5 | Community | Yes |
| Mexico | Rodriguez-Ramirez136 | 2015 |  | 4272 | 31.6 | 43.9 | Sub-national | Yes |
| Mexico | Posadas-Romero137 | 1995 | 1987 | 33558 | 35.88 |  | National | No |
| Mexico | Valdez138 | 1995 | 1991 | 1878 | 40.73 | 46.42 | Community | Yes |
| Mexico | Kumar139 | 2016 | 2001 | 2086 | 40.03 | 62.06 | National | Yes |
| Mexico | Hernandez140 | 2017 | 2012 | 194 | 22.4 | 44.2 | Community | Yes |
| Mexico | Posadas-Romero141 | 1994 | 1991 | 805 | 53.42 | 40.9 | Sub-national | Yes |
| Mexico | Aguilar142 | 1999 |  | 142 | 30.28 | 38 | Community | Yes |
| Mexico | Ferrannini143 | 2009 |  | 1941 | 41.58 | 47 | Community | Yes |
| Mexico | Aguilar-Salinas144 | 2010 | 2006 | 4040 | 46.31 | 40.3 | National | Yes |
| Mexico | Gonzales-Villalpando145 | 1999 |  | 2279 | 41.2 | 46.9 | Community | Yes |
| Nicaragua | Wong-McClure11 | 2015 | 2005 | 1587 | 37.2 |  | Community | Yes |
| Peru | Salas107 | 2016 | 2006 | 1933 | 38.81 | 74.77 | Community | Yes |
| Peru | Seclen146 | 2006 | 2000 | 612 | 31.7 |  | Community | Yes |
| Peru | Soto147 | 2005 | 2004 | 1000 | 24.2 |  | Community | Yes |
| Peru | Vinueza1 | 2010 | 2004 | 1628 |  |  | Community | Yes |
| Peru | Benzinger148 | 2010 | 2005 | 1448 | 47.44 | 52.4 | Community | Yes |
| Peru | Quispe149 | 2016 | 2011 | 3220 | 49.47 | 55.35 | Sub-national | Yes |
| Peru | Baracco150 | 2007 | 2002 | 271 | 36.16 | 47.37 | Community | Yes |
| Peru | Benziger148 | 2018 | 2010 | 3057 | 48.7 | 55.6 | Sub-national | Yes |
| Peru | Benziger151 | 2015 | 2010 | 3087 | 48.7 | 55.6 | Sub-national | Yes |
| Peru | Chirinos152 | 2014 |  | 2513 | 45.4 | 51 | Community | Yes |
| Peru | Seclen153○ | 1999 |  | 598 | 31.27 | 40.4 | Sub-national | Yes |
| Peru | Goldstein154 | 2005 | 1999 | 2237 | 52.39 | 40.6 | Sub-national | Yes |
| Peru | Medina-Lezama155 | 2007 | 2005 | 1878 | 46.2 | 49.09 | Community | Yes |
| Peru | Miranda156 | 2011 | 2007 | 1176 | 47.2 | 48 | Community | Yes |
| Peru | Malaga157 | 2010 | 2009 | 74 | 37.8 | 51.7 | Community | Yes |
| Peru | Gaziano158 | 2016 | 2010 | 3601 | 48.7 | 53.4 | Sub-national | Yes |
| Peru | Gonzales159 | 2013 | 2010 | 506 | 31.23 | 51.81 | Community | Yes |
| Peru | Cardenas160 | 2009 | 2005 | 4053 | 49.74 |  | National | Yes |
| Puerto Rico | Garcia Palmieri161 | 1972 |  | 5803 | 100 |  | National | Yes |
| Puerto Rico | Perez162 | 2011 | 2006 | 858 | 49.4 | 34.4 | Sub-national | Yes |
| Puerto Rico | Salas107 | 2016 | 2008 | 2009 | 32.7 | 76.3 | Community | Yes |
| Puerto Rico | Cruz-Vidal163 | 1979 | 1964 | 8757 | 100 | 55 | National | Yes |
| Puerto Rico | Castelli164 | 1977 | 1965 | 956 | 100 |  | Sub-national | Yes |
| Puerto Rico | Costas165 | 1978 | 1965 | 4970 | 100 |  | Community | Yes |
| Surinam | Krishnadath166 | 2016 | 2013 | 5748 | 48.5 | 35 | National | Yes |
| Trinidad and Tobago | Miljkovic-Gacic167 | 2006 |  | 202 |  | 73.1 | National | NI |
| Trinidad and Tobago | Miller168 | 1989 | 1979 | 2488 | 53.97 |  | Community | Yes |
| Uruguay | Rubinstein3 | 2015 | 2011 | 1584 |  |  | Community | Yes |
| US Virgin Islands | Tull169 | 2005 | 1998 | 1089 | 31.12 | 34.63 | Community | Yes |
| US Virgin Islands | Tull170 | 2013 | 1998 | 799 | 31.66 | 45.89 | Community | Yes |
| Venezuela | Uzcategui171 | 2015 | 2006 | 274 | 36.13 | 42.3 | Community | NI |
| Venezuela | Salazar172 | 2018 | 2008 | 2004 | 47.6 | 39.6 | Community | Yes |
| Venezuela | Bermudez173 | 2017 | 2014 | 1379 | 44.1 | 46.9 | Community | Yes |
| Venezuela | Fernandez174 | 2006 |  | 1703 | 31 | 47.02 | Community | Yes |
| Venezuela | Florez175 | 2005 | 2000 | 3108 | 30.44 | 43.72 | Community | Yes |
| Venezuela | Gonzales-Rivas176 | 2016 | 2008 | 1392 | 31.3 | 45.2 | National | Yes |
| Venezuela | Becerra177 | 2009 | 2007 | 109 | 32.11 | 39.1 | Community | Yes |
| Venezuela | Vinueza1 | 2010 | 2004 | 1824 |  |  | Community | Yes |
| Venezuela | Salas107 | 2016 | 2006 | 1965 | 36.5 | 72.3 | Community | Yes |
| Venezuela | Bermudez178 | 2013 | 2013 | 1807 | 44.7 | 39.2 | Community | Yes |

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# Supplementary Table 2: Mean levels (mg/dl) of selected lipid biomarkers (197 studies)

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Country** | **1st author** | **Publication year** | **Data collection year** | **Total cholesterol** | **LDL-cholesterol** | **HDL-cholesterol** | **Triglycerides** |
| Argentina | Vinueza | 2010 | 2004 | 201 | 126.1 | 52.5 | 114.3 |
| Argentina | Salazar | 2013 | 2003 | 231.63 | 142.69 | 58.39 | 140.83 |
| Argentina | Rubinstein | 2015 | 2011 | 199.99 | 125.25 | 45.25 | 155.39 |
| Argentina | Salazar | 2009 | 2007 |  |  | 61.7 | 124.72 |
| Argentina | Carbajal | 2001 |  |  |  |  |  |
| Argentina | Schneider | 2006 | 2001 | 209 |  |  | 124 |
| Argentina | Ferrante | 2007 | 2005 |  |  |  |  |
| Argentina | Redruello | 2008 | 2007 | 196 | 126 | 43.3 | 138 |
| Argentina | Ferrante | 2011 | 2009 |  |  |  |  |
| Barbados | Howitt | 2015 | 2012 |  |  |  |  |
| Belize | Wong-McClure | 2015 | 2005 |  |  |  |  |
| Brazil | Velasquez-Melendez | 1999 | 1991 | 184.75 | 44.7 | 117.04 | 113.87 |
| Brazil | Pereira | 2006 | 2000 | 214.4 | 142.21 | 45.36 | 137.61 |
| Brazil | Poletto | 1992 | 1989 | 174.7 | 121.5 | 52.8 |  |
| Brazil | Rigo | 2008 | 2005 | 204 | 129.67 | 43.33 | 130 |
| Brazil | Sesso | 2008 | 1992 | 202 | 129 | 39 | 147 |
| Brazil | Pimenta | 2013 | 2005 |  |  |  |  |
| Brazil | Quintino-Santos | 2012 | 1996 |  |  | 49.2 | 151.1 |
| Brazil | Togeiro | 2013 | 2007 | 190.52 | 111.53 | 53.41 | 128.09 |
| Brazil | Ota | 2011 | 2001 | 215.9 | 131.85 | 54.36 | 149.51 |
| Brazil | Pimenta | 2007 | 2001 |  |  |  |  |
| Brazil | Souza | 2003 | 2001 | 187.65 | 104.35 | 48.4 | 150.08 |
| Brazil | Yokota | 2012 | 2010 |  |  |  |  |
| Brazil | Petris | 2016 | 2011 |  |  |  |  |
| Brazil | Pirkle | 2018 | 2012 |  |  | 53.33 | 139.7 |
| Brazil | Werle | 2011 | 1994 | 211.6 | 139.1 | 45.5 | 137.2 |
| Brazil | Oliveira | 2012 | 2006 | 163 |  |  | 148.54 |
| Brazil | Venturini | 2013 | 2006 | 209.95 | 132.7 | 45.68 | 172.07 |
| Brazil | Pavan | 1997 |  | 185.8 |  |  |  |
| Brazil | Roriz-Cruz | 2007 |  | 188.77 | 117.64 | 43.35 | 138.72 |
| Brazil | Neumann | 2007 | 2001 |  |  |  |  |
| Brazil | Nunes Filho | 2007 | 2006 |  |  |  |  |
| Brazil | Gimeno | 2011 | 2006 |  |  |  |  |
| Brazil | Moraes | 2012 | 2007 |  |  |  |  |
| Brazil | Garcez | 2014 | 2008 | 187 | 112 | 48 | 139 |
| Brazil | Garcez | 2014 | 2008 | 206 | 126 | 52 | 141 |
| Brazil | Igor Conterato Gomes | 2013 | 2010 | 200.91 | 110.23 |  |  |
| Brazil | Fortanelli | 2018 | 2015 |  |  |  |  |
| Brazil | Marquezine | 2008 |  |  |  |  |  |
| Brazil | Mendes-Lana | 2007 |  | 200.21 | 102.08 | 67.01 | 151.3 |
| Brazil | Pena | 2016 | 2009 | 195.7 |  | 48.55 | 105.67 |
| Brazil | Bieleman | 2014 | 1982 |  |  | 51.6 | 97.5 |
| Brazil | Cardoso | 2002 | 1991 |  |  |  |  |
| Brazil | Buffarini | 2018 | 1993 | 162.27 | 90.65 | 56.29 | 72.89 |
| Brazil | de Oliveira | 2010 | 1999 | 214.4 | 142.49 | 45.3 | 137.06 |
| Brazil | Martins | 1989 | 1987 |  |  |  |  |
| Brazil | Fornes | 2000 | 1990 |  |  |  |  |
| Brazil | Martins | 1996 | 1991 | 186.08 | 117.1 | 44.97 | 116.49 |
| Brazil | Correa Leite | 2013 | 1997 |  | 155 | 49.2 | 151.2 |
| Brazil | Gus | 2002 | 2000 |  |  |  |  |
| Brazil | Marcopito | 2005 | 2001 |  |  |  |  |
| Brazil | de Oliveira | 2008 | 2006 | 180.78 | 98.66 | 55.9 | 133.3 |
| Brazil | de Castro | 2015 | 2009 | 197.9 | 120.6 | 50 | 138.4 |
| Brazil | de Souza | 2016 | 2009 | 182.12 | 109.28 | 47.42 | 109.57 |
| Brazil | Drumond | 2011 | 2009 |  |  |  |  |
| Brazil | Mendes | 2014 | 2009 |  |  |  |  |
| Brazil | Castro | 2016 | 2010 |  |  |  |  |
| Brazil | Cocate | 2013 | 2011 | 211.29 |  | 44.47 | 118.87 |
| Brazil | Costa-Fagundes | 2018 | 2011 |  |  |  |  |
| Brazil | Barbosa | 2016 | 2012 |  |  | 44.04 | 85.78 |
| Brazil | Bernardi | 2015 | 2003 | 167.9 | 96.1 | 48.3 | 82.58 |
| Brazil | Candido | 2007 |  | 31.18 | 30.92 | 31.18 | 31.02 |
| Brazil | de Oliveira | 2012 |  | 192.27 |  |  | 152.76 |
| Brazil | de Oliveira | 2013 |  | 199.6 | 128.8 | 46.8 | 122.3 |
| Brazil | de Oliveira | 2017 |  | 214.33 | 142.13 | 45.39 | 139.05 |
| Brazil | Dressler | 2006 |  | 187.2 | 112.6 |  |  |
| Brazil | Beleigoli | 2017 | 2000 | 230 |  |  |  |
| Brazil | Bustos | 2007 | 2002 |  |  |  |  |
| Brazil | Costa | 2010 | 2004 |  |  |  |  |
| Brazil | Carnelosso | 2010 | 2004 |  |  |  |  |
| Brazil | Cabral | 2015 | 2013 | 182.43 | 110.76 | 51.31 | 101.62 |
| Brazil | Matos | 2003 |  | 205 | 116.7 | 70 | 128.6 |
| Chile | Jadue | 1999 | 1997 |  |  |  |  |
| Chile | Garcia Hermozo | 2017 | 2009 | 194.7 |  |  | 149.9 |
| Chile | Vinueza | 2010 | 2004 | 199.1 | 119.6 | 49.4 | 159.6 |
| Chile | Palomo | 2007 | 2005 |  |  |  |  |
| Chile | Tejos | 2013 | 2010 | 189.05 | 113.43 | 47.23 | 144.07 |
| Chile | Villanueva | 2018 | 2010 |  |  |  |  |
| Chile | Rubinstein | 2015 | 2011 | 202 | 125.6 | 45 | 169.1 |
| Chile | Lanas | 2016 | 2009 | 189.1 | 113.78 | 47.82 |  |
| Chile | Lara | 2012 |  | 178.3 | 114.6 | 41.4 | 112.5 |
| Chile | Mena | 2015 |  | 196.8 | 110.1 | 52.1 | 161.3 |
| Chile | Miquel | 1998 |  | 184.35 |  | 44.92 | 126.09 |
| Chile | Mujica | 2008 |  |  |  | 51.9 | 162.01 |
| Chile | Valenzuela | 2010 | 2003 |  |  |  |  |
| Chile | Group I multicentre collaborative | 1992 | 1989 | 193.35 |  | 38.67 |  |
| Chile | Cuevas | 2008 | 1997 |  |  |  |  |
| Chile | Pivatto | 2007 | 2001 |  |  |  |  |
| Chile | Amigo | 2010 | 2002 | 176.72 | 113.69 | 40.99 | 111.6 |
| Chile | LabraÃ±a | 2017 | 2009 |  |  |  |  |
| Chile | Acevedo | 2009 | 2007 | 201.3 | 120.6 | 49.5 | 156.4 |
| Chile | Acevedo | 2012 | 2005 | 202 | 121 | 50 | 157 |
| Chile | Berrios | 1997 | 1988 | 195.84 |  |  |  |
| Colombia | Roldan-Menco | 2017 |  | 202.66 | 115.87 | 41.04 | 194.45 |
| Colombia | Pirkle | 2018 | 2012 |  |  | 48 | 149 |
| Colombia | Arbey | 2011 |  | 202 | 119.5 | 42.8 | 210 |
| Colombia | Patino-Villada | 2011 | 2009 |  |  |  |  |
| Colombia | Camacho | 2018 | 2006 | 201.1 | 118.9 | 41.9 | 181.5 |
| Colombia | Vinueza | 2010 | 2004 | 193.7 | 120.4 | 42.2 | 164.7 |
| Colombia | Palmett-Rios | 2017 | 2011 |  |  | 39.11 |  |
| Colombia | Bautista | 2006 | 2001 | 200.31 | 134.96 | 39.83 |  |
| Colombia | Gallo | 2013 | 2007 | 222.18 | 149.4 | 39.78 | 163.3 |
| Colombia | AlayÃ³n | 2010 | 2008 |  |  |  |  |
| Costa Rica | Campos | 1991 | 1988 |  |  |  |  |
| Costa Rica | Wong-McClure | 2015 | 2005 |  |  |  |  |
| Costa Rica | Holst | 2006 | 2001 | 208.98 | 135.8 | 39.1 | 173.7 |
| Costa Rica | Chanti-Ketterl | 2017 | 2005 | 216.55 |  |  |  |
| Costa Rica | Campos | 1991 | 1988 | 180.7 | 110.72 | 42.83 | 134.8 |
| Costa Rica | Rehkopf | 2018 | 2005 |  |  | 46 | 170 |
| Costa Rica | Jimenez | 1987 | 1982 | 203.77 |  |  | 128.31 |
| Costa Rica | Goldman | 2011 | 2005 |  |  |  |  |
| Costa Rica | Williams | 2007 | 1996 | 201.31 |  | 41.95 | 209.44 |
| Cuba | Salas | 2016 | 2004 |  |  |  |  |
| Cuba | Nordet | 2013 | 2009 | 181.75 |  |  |  |
| Dominica | Robinson | 2004 |  | 182.4 | 105.9 | 49 | 133.4 |
| Dominican Republic | Aono | 1999 | 1993 | 177 |  | 40.7 |  |
| Dominican Republic | Salas | 2016 | 2005 |  |  |  |  |
| Dominican Republic | Dong | 2011 | 1997 | 183.5 | 109.5 | 50.3 | 119.2 |
| Ecuador | Encalada-Torres | 2017 | 2015 |  |  | 40.65 | 158.42 |
| Ecuador | Vinueza | 2010 | 2004 | 207.3 | 126.6 | 49 | 162.5 |
| Ecuador | Orces | 2017 | 2010 |  |  |  |  |
| Ecuador | Sisa | 2018 | 2010 | 200.2 | 117.33 | 48.3 | 141.67 |
| El Salvador | Orantes | 2011 | 2009 |  |  |  |  |
| Granada | Bansilal | 2012 | 2009 | 176.88 | 115.43 | 48.14 |  |
| Guatemala | Wong-McClure | 2015 | 2005 |  |  |  |  |
| Guatemala | Romero-Abal | 1994 |  | 220.8 |  |  | 195.2 |
| Guatemala | Cria O Gregory | 2009 | 1998 | 141.15 |  | 37.12 | 129.32 |
| Haiti | DeGennaro | 2018 | 2016 |  |  |  |  |
| Honduras | Wong-McClure | 2015 | 2005 |  |  |  |  |
| Honduras | Jaime Hall MartÃ­ne | 2005 | 2003 |  | 98.71 | 43.42 | 228.23 |
| Jamaica | Ferguson | 2017 | 2007 | 172.47 |  |  |  |
| Jamaica | Gupta | 2010 | 1996 | 184.46 | 121.42 | 50.27 | 71.74 |
| Jamaica | Florey | 1973 |  | 216.72 |  |  | 79.82 |
| Jamaica | Ferguson | 2008 | 2001 | 174.01 |  |  |  |
| Jamaica | Ferguson | 2010 | 2006 |  |  | 46.4 | 51.37 |
| Jamaica | Tulloch-Reid1 | 2013 | 2008 |  |  |  |  |
| Jamaica | Stringhini | 2016 | 2011 |  |  |  |  |
| Mexico | Vinueza | 2010 | 2004 | 202.9 | 118.7 | 49.2 | 183.9 |
| Mexico | Rosas-Saucedo | 2009 |  |  |  |  |  |
| Mexico | Sanchez-Corona | 2004 |  | 185.62 |  |  | 158.54 |
| Mexico | Aguilar-Salinas | 2002 | 1993 | 174.05 |  | 37.75 | 199.37 |
| Mexico | Aguilar-Salinas | 2011 | 2000 | 196.4 | 112.53 | 43.7 | 201.5 |
| Mexico | Escobedo de la PeÃ±a | 2014 | 2004 | 202.9 | 118.7 | 49.2 | 183.9 |
| Mexico | EchevarrÃ­a-Pinto | 2006 | 2005 |  |  |  |  |
| Mexico | Salas | 2016 | 2007 |  |  |  |  |
| Mexico | Rodriguez-Moran | 2001 |  | 209.98 | 135.34 | 41.38 | 404.76 |
| Mexico | Rodriguez-Ramirez | 2015 |  | 202.1 |  | 43.6 | 172.6 |
| Mexico | Posadas-Romero | 1995 | 1987 | 185.83 |  |  |  |
| Mexico | Valdez | 1995 | 1991 | 190.76 | 123.28 | 32.95 | 176.43 |
| Mexico | Kumar | 2016 | 2001 |  |  |  |  |
| Mexico | Hernandez | 2017 | 2012 | 193 |  |  | 181.5 |
| Mexico | Posadas-Romero | 1994 | 1991 | 206.88 | 138.44 | 43.31 | 157.65 |
| Mexico | Aguilar | 1999 |  | 165 |  | 42 | 126 |
| Mexico | Ferrannini | 2009 |  |  | 118.02 | 33.37 | 211.42 |
| Mexico | Aguilar-Salinas | 2010 | 2006 | 198.5 | 131.5 | 38.9 | 139.6 |
| Mexico | Gonzales-Villalpando | 1999 |  |  | 122.74 | 32.83 | 210.96 |
| Nicaragua | Wong-McClure | 2015 | 2005 |  |  |  |  |
| Peru | Salas | 2016 | 2006 |  |  |  |  |
| Peru | Seclen | 2006 | 2000 |  |  | 54.14 | 144.37 |
| Peru | Soto | 2005 | 2004 | 203.6 |  | 48.1 | 161 |
| Peru | Vinueza | 2010 | 2004 | 188.4 | 121.5 | 39.4 | 140.3 |
| Peru | Benzinger | 2010 | 2005 |  |  |  |  |
| Peru | Quispe | 2016 | 2011 |  |  |  |  |
| Peru | Baracco | 2007 | 2002 |  |  | 53.83 | 156.41 |
| Peru | Benziger | 2018 | 2010 |  |  |  |  |
| Peru | Benziger | 2015 | 2010 |  |  | 41.49 | 160.62 |
| Peru | Chirinos | 2014 |  |  | 115.18 | 46.18 | 152.35 |
| Peru | Seclen | 1999 |  |  |  |  |  |
| Peru | Goldstein | 2005 | 1999 |  |  |  |  |
| Peru | Medina-Lezama | 2007 | 2005 | 201.52 |  |  |  |
| Peru | Miranda | 2011 | 2007 | 184.49 | 110.53 | 44.1 | 129.34 |
| Peru | Malaga | 2010 | 2009 |  |  |  |  |
| Peru | Gaziano | 2016 | 2010 | 200.2 |  |  |  |
| Peru | Gonzales | 2013 | 2010 | 170.18 | 102.62 | 36.61 | 182.63 |
| Peru | Cardenas | 2009 | 2005 |  |  |  |  |
| Puerto Rico | Garcia Palmieri | 1972 |  | 202.63 |  |  | 149.9 |
| Puerto Rico | Perez | 2011 | 2006 | 191.3 | 117.5 | 49.4 | 141.7 |
| Puerto Rico | Salas | 2016 | 2008 |  |  |  |  |
| Puerto Rico | Cruz-Vidal | 1979 | 1964 | 201.41 |  |  | 146.06 |
| Puerto Rico | Castelli | 1977 | 1965 | 188.78 |  |  | 155.19 |
| Puerto Rico | Costas | 1978 | 1965 | 191 |  |  | 164 |
| Surinam | Krishnadath | 2016 | 2013 | 170.14 | 116.1 | 46.4 | 115.15 |
| Trinidad and Tobago | Miljkovic-Gacic | 2006 |  | 179.2 | 113.7 | 49.9 | 78.7 |
| Trinidad and Tobago | Miller | 1989 | 1979 | 228.93 | 162.41 | 42.54 |  |
| Uruguay | Rubinstein | 2015 | 2011 | 208.3 | 133 | 48.2 | 140.3 |
| US Virgin Islands | Tull | 2005 | 1998 |  |  |  |  |
| US Virgin Islands | Tull | 2013 | 1998 |  |  | 48.72 | 220.54 |
| Venezuela | Uzcategui | 2015 | 2006 |  |  |  |  |
| Venezuela | Salazar | 2018 | 2008 |  |  |  |  |
| Venezuela | Bermudez | 2017 | 2014 |  |  |  |  |
| Venezuela | Fernandez | 2006 |  | 178.29 |  | 44.4 | 157.17 |
| Venezuela | Florez | 2005 | 2000 | 170.74 |  | 43.42 | 135.7 |
| Venezuela | Gonzales-Rivas | 2016 | 2008 | 206.92 | 131.18 | 45.88 | 154.19 |
| Venezuela | Becerra | 2009 | 2007 | 185 |  | 41 | 184 |
| Venezuela | Vinueza | 2010 | 2004 | 174.2 | 104.6 | 40.1 | 150.7 |
| Venezuela | Salas | 2016 | 2006 |  |  |  |  |
| Venezuela | Bermudez | 2013 | 2013 | 189.27 | 119.86 | 44.35 | 127.53 |

# Supplementary Table 3: prevalence estimates of selected lipid biomarkers (197 studies)

|  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **Country** | **1st author** | **Publication year** | **Data collection year** | **Total cholesterol** | | **LDL-cholesterol** | | **HDL-cholesterol** | | **Triglycerides** | |
| Argentina | Vinueza | 2010 | 2004 | 18.7 | >=240 | 24.7 | mixed with Fr | 16.9 | <40 | 9.8 | >=200 |
| Argentina | Salazar | 2013 | 2003 |  |  |  |  |  |  |  |  |
| Argentina | Rubinstein | 2015 | 2011 | 21.75 | >=240 | 20.35 | >=160 | 35.49 | <40 | 21.25 | >=200 |
| Argentina | Salazar | 2009 | 2007 |  |  |  |  |  |  |  |  |
| Argentina | Carbajal | 2001 |  | 18.58 | >=5.18 |  |  |  |  |  |  |
| Argentina | Schneider | 2006 | 2001 |  |  |  |  |  |  |  |  |
| Argentina | Ferrante | 2007 | 2005 | 27.8 |  |  |  |  |  |  |  |
| Argentina | Redruello | 2008 | 2007 |  |  |  |  |  |  |  |  |
| Argentina | Ferrante | 2011 | 2009 | 29.1 |  |  |  |  |  |  |  |
| Barbados | Howitt | 2015 | 2012 | 21.2 | >=194 |  |  |  |  |  |  |
| Belize | Wong-McClure | 2015 | 2005 |  |  |  |  | 51 | <40(men) & <50 (women) | 38 | >=150 |
| Brazil | Velasquez-Melendez | 1999 | 1991 |  |  |  |  |  |  |  |  |
| Brazil | Pereira | 2006 | 2000 |  |  |  |  |  |  |  |  |
| Brazil | Poletto | 1992 | 1989 |  |  |  |  |  |  |  |  |
| Brazil | Rigo | 2008 | 2005 |  |  |  |  |  |  |  |  |
| Brazil | Sesso | 2008 | 1992 |  |  |  |  |  |  |  |  |
| Brazil | Pimenta | 2013 | 2005 |  |  |  |  | 44.1 | <40(men) & <50 (women) | 15.2 | >=150 |
| Brazil | Quintino-Santos | 2012 | 1996 |  |  |  |  |  |  |  |  |
| Brazil | Togeiro | 2013 | 2007 |  |  |  |  |  |  |  |  |
| Brazil | Ota | 2011 | 2001 |  |  |  |  |  |  |  |  |
| Brazil | Pimenta | 2007 | 2001 | 47.45 | >=200 | 43.14 | >=130 | 20.63 | <40 | 8.17 | >=200 |
| Brazil | Souza | 2003 | 2001 | 4.2 | >=240 | 13.1 | >=130 | 14.3 | <40 | 28.2 | >=150 |
| Brazil | Yokota | 2012 | 2010 | 49.2 | >200 | 48.4 | >200 | 36.9 | <40 | 10 | >200 |
| Brazil | Petris | 2016 | 2011 | 18.6 | >=240 | 17.31 | >=160 | 31.3 | <40 | 20.06 | >=200 |
| Brazil | Pirkle | 2018 | 2012 |  |  |  |  |  |  |  |  |
| Brazil | Werle | 2011 | 1994 |  |  |  |  |  |  |  |  |
| Brazil | Oliveira | 2012 | 2006 | 13 | >=200 |  |  |  |  | 39.7 | >=150 |
| Brazil | Venturini | 2013 | 2006 | 56.94 | >200 | 21.56 | >=160 | 59.4 | <40(men) & <50 (women) | 49.77 | >=150 |
| Brazil | Pavan | 1997 |  |  |  |  |  |  |  |  |  |
| Brazil | Roriz-Cruz | 2007 |  |  |  |  |  | 52.65 | <40(men) & <45 (women) | 67.52 | >=150 |
| Brazil | Neumann | 2007 | 2001 | 35.5 | >=200 | 34.5 | >=100 | 43.4 | <40 | 26.6 | >=150 |
| Brazil | Nunes Filho | 2007 | 2006 | 8.5 | >240 | 3.3 | >160 | 7.1 | <40 |  |  |
| Brazil | Gimeno | 2011 | 2006 | 22.8 | >200 |  |  |  |  |  |  |
| Brazil | Moraes | 2012 | 2007 | 43.7 | >=200 | 33.3 | >=130 | 20.4 | <40 | 25 | >=150 |
| Brazil | Garcez | 2014 | 2008 | 27.09 | >=200 |  |  | 44.15 | <=40(men) & <=50 (women) |  |  |
| Brazil | Garcez | 2014 | 2008 | 36.5 | >=200 |  |  | 30.04 | <=40(men) & <=50 (women) |  |  |
| Brazil | Igor Conterato Gomes | 2013 | 2010 | 51.3 | >200 | 31 | >150 |  |  |  |  |
| Brazil | Fortanelli | 2018 | 2015 | 17.15 | >=240 | 15.42 | >=160 |  |  |  |  |
| Brazil | Marquezine | 2008 |  | 59.5 | >=200 | 57.9 | >=130 | 54.3 | <40(men) & <50 (women) | 30.9 | >=150 |
| Brazil | Mendes-Lana | 2007 |  |  |  |  |  |  |  |  |  |
| Brazil | Pena | 2016 | 2009 |  |  |  |  |  |  |  |  |
| Brazil | Bieleman | 2014 | 1982 |  |  |  |  | 15.1 | <40 | 22.6 | >=150 |
| Brazil | Cardoso | 2002 | 1991 | 35.6 | >=200 | 34.1 | >=130 | 82 | <35 | 13 | >=200 |
| Brazil | Buffarini | 2018 | 1993 |  |  |  |  |  |  |  |  |
| Brazil | de Oliveira | 2010 | 1999 |  |  |  |  |  |  |  |  |
| Brazil | Martins | 1989 | 1987 | 19.71 | >200 |  |  | 37.63 | <35(men) & <45 (women) | 19 | >140 |
| Brazil | Fornes | 2000 | 1990 |  |  | 12 | >=160 | 22.1 | <=35 |  |  |
| Brazil | Martins | 1996 | 1991 |  |  |  |  |  |  |  |  |
| Brazil | Correa Leite | 2013 | 1997 |  |  |  |  |  |  |  |  |
| Brazil | Gus | 2002 | 2000 | 5.6 | >=240 |  |  |  |  |  |  |
| Brazil | Marcopito | 2005 | 2001 | 8.1 | >=240 |  |  | 27.1 | <40 | 14.4 | >=200 |
| Brazil | de Oliveira | 2008 | 2006 | 34.5 | >=200 | 25.7 | >=130 | 29.3 | <40(men) & <50 (women) | 31.1 | >=130 |
| Brazil | de Castro | 2015 | 2009 |  |  | 30.5 | >=130 | 38 | <40(men) & <50 (women) | 30.5 | >=150 |
| Brazil | de Souza | 2016 | 2009 |  |  |  |  |  |  |  |  |
| Brazil | Drumond | 2011 | 2009 | 51 | >=200 | 17.8 | >=160 | 34.6 | <40(men) & <50 (women) | 17.3 | >=150 |
| Brazil | Mendes | 2014 | 2009 | 19.41 | >=240 |  |  |  |  |  |  |
| Brazil | Castro | 2016 | 2010 |  |  | 38 |  | 37 |  | 32 |  |
| Brazil | Cocate | 2013 | 2011 |  |  |  |  |  |  |  |  |
| Brazil | Costa-Fagundes | 2018 | 2011 | 52.4 | >=200 |  |  |  |  |  |  |
| Brazil | Barbosa | 2016 | 2012 |  |  |  |  | 61.2 | <40(men) & <50 (women) | 17.3 | >150 |
| Brazil | Bernardi | 2015 | 2003 |  |  |  |  |  |  |  |  |
| Brazil | Candido | 2007 |  |  |  |  |  |  |  |  |  |
| Brazil | de Oliveira | 2012 |  |  |  |  |  |  |  |  |  |
| Brazil | de Oliveira | 2013 |  |  |  |  |  |  |  |  |  |
| Brazil | de Oliveira | 2017 |  |  |  |  |  |  |  |  |  |
| Brazil | Dressler | 2006 |  |  |  |  |  |  |  |  |  |
| Brazil | Beleigoli | 2017 | 2000 |  |  |  |  |  |  |  |  |
| Brazil | Bustos | 2007 | 2002 |  |  |  |  | 42.2 | <40(men) & <50 (women) | 12.9 | >=150 |
| Brazil | Costa | 2010 | 2004 | 23.6 |  |  |  |  |  |  |  |
| Brazil | Carnelosso | 2010 | 2004 | 44.4 | >200 |  |  |  |  | 13.3 | >=200 |
| Brazil | Cabral | 2015 | 2013 |  |  |  |  |  |  |  |  |
| Brazil | Matos | 2003 |  | 51.6 | >=200 | 14.3 | >=160 |  |  | 14.3 | >=200 |
| Chile | Jadue | 1999 | 1997 | 46.9 | >=200 |  |  |  |  |  |  |
| Chile | Garcia Hermozo | 2017 | 2009 | 43.3 | >=200 |  |  |  |  |  |  |
| Chile | Vinueza | 2010 | 2004 | 15.3 | >=240 | 19.9 | mixed with Fr | 21.2 | <40 | 22.7 | >=200 |
| Chile | Palomo | 2007 | 2005 | 44.5 | >200 | 65.3 | >100 | 39.2 | <40(men) & <50 (women) | 40.1 | >=150 |
| Chile | Tejos | 2013 | 2010 |  |  |  |  |  |  |  |  |
| Chile | Villanueva | 2018 | 2010 | 38.46 | >=200 | 30.23 | >=130 | 28.91 | <40(men) & <50 (women) | 30.75 | >=150 |
| Chile | Rubinstein | 2015 | 2011 | 24.8 | >=240 | 22.9 | >=160 | 36.9 | <40 | 25.7 | >=200 |
| Chile | Lanas | 2016 | 2009 | 38.5 | >200 | 21.9 | increased |  | <40 |  |  |
| Chile | Lara | 2012 |  | 25.9 | >=200 | 10.4 | >=160 | 49 | <=40 | 17.6 | >=150 |
| Chile | Mena | 2015 |  |  |  |  |  |  |  |  |  |
| Chile | Miquel | 1998 |  |  |  |  |  |  |  |  |  |
| Chile | Mujica | 2008 |  |  |  |  |  | 21.5 | <40(men) & <50 (women) | 40.1 | >=150 |
| Chile | Valenzuela | 2010 | 2003 |  |  |  |  | 52.6 | <40(men) & <50 (women) | 30 | >=150 |
| Chile | Group I multicentre collaborative | 1992 | 1989 |  |  |  |  |  |  |  |  |
| Chile | Cuevas | 2008 | 1997 | 37.3 | >=200 |  |  |  |  |  |  |
| Chile | Pivatto | 2007 | 2001 |  |  |  |  | 66.7 | <40(men) & <50 (women) | 17.9 | >=150 |
| Chile | Amigo | 2010 | 2002 |  |  |  |  |  |  |  |  |
| Chile | LabraÃ±a | 2017 | 2009 |  | >=200 |  |  | 47.3 | <40(men) & <50 (women) | 35.2 | >=150 |
| Chile | Acevedo | 2009 | 2007 |  |  |  |  |  |  |  |  |
| Chile | Acevedo | 2012 | 2005 |  |  |  |  |  |  |  |  |
| Chile | Berrios | 1997 | 1988 | 7.23 | >=6.15 |  |  |  |  |  |  |
| Colombia | Roldan-Menco | 2017 |  |  |  |  |  | 79.6 | <40(men) & <50 (women) | 75.9 | >150 |
| Colombia | Pirkle | 2018 | 2012 |  |  |  |  |  |  |  |  |
| Colombia | Arbey | 2011 |  |  |  |  |  |  |  |  |  |
| Colombia | Patino-Villada | 2011 | 2009 | 9 | >=240 | 5.9 | >=160 | 14 | <=40 | 19.3 | >=200 |
| Colombia | Camacho | 2018 | 2006 | 48.7 | >=200 | 75.3 | >=130 | 57.1 | <=40(men) & <=50 (women) | 49.7 | >=150 |
| Colombia | Vinueza | 2010 | 2004 | 11.7 | >=240 | 19.1 | mixed with Fr | 45.6 | <40 | 23.2 | >=200 |
| Colombia | Palmett-Rios | 2017 | 2011 |  |  |  |  | 80.5 | <40(men) & <50 (women) |  |  |
| Colombia | Bautista | 2006 | 2001 | 18.3 | >=6.15 | 22.3 | >=4.1 | 27.7 | <0.9 |  |  |
| Colombia | Gallo | 2013 | 2007 |  |  |  |  |  |  |  |  |
| Colombia | AlayÃ³n | 2010 | 2008 | 39 | >200 | 34 | >130 | 42 | <40 | 39 |  |
| Costa Rica | Campos | 1991 | 1988 | 8.21 | >=240 | 8.32 | >=160 | 21.34 | <35 |  |  |
| Costa Rica | Wong-McClure | 2015 | 2005 |  |  |  |  | 62 | <40(men) & <50 (women) | 58 | >=150 |
| Costa Rica | Holst | 2006 | 2001 |  |  |  |  |  |  |  |  |
| Costa Rica | Chanti-Ketterl | 2017 | 2005 |  |  |  |  |  |  |  |  |
| Costa Rica | Campos | 1991 | 1988 |  |  |  |  |  |  |  |  |
| Costa Rica | Rehkopf | 2018 | 2005 |  |  |  |  |  |  |  |  |
| Costa Rica | Jimenez | 1987 | 1982 |  |  |  |  |  |  |  |  |
| Costa Rica | Goldman | 2011 | 2005 | 29.81 | >=240 |  |  |  |  | 23.61 | >=200 |
| Costa Rica | Williams | 2007 | 1996 |  |  |  |  | 60.36 | <40(men) & <50 (women) | 67.18 | >=150 |
| Cuba | Salas | 2016 | 2004 |  |  |  |  | 55.1 | <40(men) & <45 (women) | 32.7 | >=150 |
| Cuba | Nordet | 2013 | 2009 | 5.9 | >=6 |  |  |  |  |  |  |
| Dominica | Robinson | 2004 |  |  |  |  |  |  |  |  |  |
| Dominican Republic | Aono | 1999 | 1993 |  |  |  |  |  | Rep. Dom |  |  |
| Dominican Republic | Salas | 2016 | 2005 | 41.1 | >=5.2 |  |  |  |  | 19.4 | >=150 |
| Dominican Republic | Dong | 2011 | 1997 |  |  |  |  |  |  |  |  |
| Ecuador | Encalada-Torres | 2017 | 2015 |  |  |  |  |  |  |  |  |
| Ecuador | Vinueza | 2010 | 2004 | 20.2 | >=240 | 23.9 | mixed with Fr | 21.6 | <40 | 23.8 | >=200 |
| Ecuador | Orces | 2017 | 2010 | 16.54 | >240 | 12.24 | >=160 | 28.61 | <40 | 23.28 | >=200 |
| Ecuador | Sisa | 2018 | 2010 |  |  |  |  |  |  |  |  |
| El Salvador | Orantes | 2011 | 2009 | 23.2 | >240 | 15 | >160 | 19.6 | <35(men) & <39 (women) | 49.7 | >150 |
| Granada | Bansilal | 2012 | 2009 | 8.6 | >=240 |  |  |  |  |  |  |
| Guatemala | Wong-McClure | 2015 | 2005 |  |  |  |  | 38 | <40(men) & <50 (women) | 62 | >=150 |
| Guatemala | Romero-Abal | 1994 |  | 26 | >=240 |  |  |  |  | 36 | >170 |
| Guatemala | Cria O Gregory | 2009 | 1998 | 3.53 | >200 |  |  | 81.03 | <40(men) & <50 (women) | 28.73 | >=150 |
| Haiti | DeGennaro | 2018 | 2016 | 2.3 | >=240 | 2.7 | >=160 | 34.7 | <40(men) & <50 (women) | 7.4 | >=200 |
| Honduras | Wong-McClure | 2015 | 2005 |  |  |  |  | 21 | <40(men) & <50 (women) | 56 | >=150 |
| Honduras | Jaime Hall MartÃ­ne | 2005 | 2003 |  |  |  |  |  |  |  |  |
| Jamaica | Ferguson | 2017 | 2007 | 18.1 | >=5.2 |  |  |  |  |  |  |
| Jamaica | Gupta | 2010 | 1996 |  |  |  |  |  |  |  |  |
| Jamaica | Florey | 1973 |  |  |  |  |  |  |  |  |  |
| Jamaica | Ferguson | 2008 | 2001 |  |  |  |  |  |  |  |  |
| Jamaica | Ferguson | 2010 | 2006 |  |  |  |  |  |  |  |  |
| Jamaica | Tulloch-Reid1 | 2013 | 2008 | 18.4 | >=5.2 |  |  |  |  |  |  |
| Jamaica | Stringhini | 2016 | 2011 | 12.5 | >=5.2 |  |  |  |  |  |  |
| Mexico | Vinueza | 2010 | 2004 | 16.4 | >=240 | 25.6 | mixed with Fr | 22.6 | <40 | 32.5 | >=200 |
| Mexico | Rosas-Saucedo | 2009 |  | 34.3 |  |  |  |  |  | 45 |  |
| Mexico | Sanchez-Corona | 2004 |  |  |  |  |  |  |  |  |  |
| Mexico | Aguilar-Salinas | 2002 | 1993 |  |  |  |  |  |  |  |  |
| Mexico | Aguilar-Salinas | 2011 | 2000 |  |  |  |  |  |  |  |  |
| Mexico | Escobedo de la PeÃ±a | 2014 | 2004 | 16.4 | >=240 | 12.3 | >=160 | 22.6 | <40 | 32.5 | >=200 |
| Mexico | EchevarrÃ­a-Pinto | 2006 | 2005 |  |  |  |  |  |  | 61.6 | >=150 |
| Mexico | Salas | 2016 | 2007 |  |  |  |  | 44.39 | <40(men) & <45 (women) | 48.3 | >=150 |
| Mexico | Rodriguez-Moran | 2001 |  |  |  |  |  |  |  |  |  |
| Mexico | Rodriguez-Ramirez | 2015 |  |  |  |  |  |  |  |  |  |
| Mexico | Posadas-Romero | 1995 | 1987 | 10.6 | >=6.2 |  |  |  |  |  |  |
| Mexico | Valdez | 1995 | 1991 |  |  |  |  |  |  |  |  |
| Mexico | Kumar | 2016 | 2001 | 40.95 | >=200 |  |  | 69.25 | <40(men) & <50 (women) |  |  |
| Mexico | Hernandez | 2017 | 2012 | 37.3 | >=200 |  |  |  |  | 64.9 | >=150 |
| Mexico | Posadas-Romero | 1994 | 1991 |  |  |  |  |  |  |  |  |
| Mexico | Aguilar | 1999 |  |  |  |  |  |  |  |  |  |
| Mexico | Ferrannini | 2009 |  |  |  |  |  |  |  |  |  |
| Mexico | Aguilar-Salinas | 2010 | 2006 | 43.6 | >=200 | 46 | >=130 | 60.5 | <40 | 31.5 | >=150 |
| Mexico | Gonzales-Villalpando | 1999 |  |  |  |  |  |  |  |  |  |
| Nicaragua | Wong-McClure | 2015 | 2005 |  |  |  |  | 57 | <40(men) & <50 (women) | 42 | >=150 |
| Peru | Salas | 2016 | 2006 | 47.8 | >=5.2 |  |  |  |  |  |  |
| Peru | Seclen | 2006 | 2000 |  |  |  |  | 65.2 | <40(men) & <45 (women) | 83.1 | >=150 |
| Peru | Soto | 2005 | 2004 | 47.3 | >=200 |  |  | 56.3 | <40(men) & <50 (women) | 43.4 | >=150 |
| Peru | Vinueza | 2010 | 2004 | 11.6 | >=240 | 17.7 | mixed with Fr | 56.9 | <40 | 19.5 | >=200 |
| Peru | Benzinger | 2010 | 2005 |  |  |  |  | 43.31 | <40(men) & <50 (women) |  |  |
| Peru | Quispe | 2016 | 2011 |  |  |  |  | 65.85 | <40(men) & <50 (women) | 43.1 | >=150 |
| Peru | Baracco | 2007 | 2002 |  |  |  |  |  |  |  |  |
| Peru | Benziger | 2018 | 2010 | 48.08 | >=200 |  |  |  |  |  |  |
| Peru | Benziger | 2015 | 2010 |  |  |  |  | 66.4 | <40(men) & <50 (women) | 43.1 | >=150 |
| Peru | Chirinos | 2014 |  |  |  |  |  |  |  |  |  |
| Peru | Seclen | 1999 |  | 26.66 | >=240 |  |  |  |  |  |  |
| Peru | Goldstein | 2005 | 1999 | 23.91 | >=240 |  |  | 39.02 | <40 |  |  |
| Peru | Medina-Lezama | 2007 | 2005 |  |  |  |  |  |  |  |  |
| Peru | Miranda | 2011 | 2007 |  |  |  |  |  |  |  |  |
| Peru | Malaga | 2010 | 2009 | 40.6 | >=200 | 71.6 | >=100 | 48.6 | <40 | 48.6 | >150 |
| Peru | Gaziano | 2016 | 2010 |  |  |  |  |  |  |  |  |
| Peru | Gonzales | 2013 | 2010 | 26.58 | >=200 | 11.23 | >=160 | 43.85 | <40 | 64.5 | >=150 |
| Peru | Cardenas | 2009 | 2005 |  | < 40 en Hombres y < 50 en mujeres |  |  | 54.2 | <40 | 30 | >=150 |
| Puerto Rico | Garcia Palmieri | 1972 |  |  |  |  |  |  |  |  |  |
| Puerto Rico | Perez | 2011 | 2006 |  |  |  |  | 45.8 | <40(men) & <50 (women) | 31.2 | >=150 |
| Puerto Rico | Salas | 2016 | 2008 |  |  |  |  | 47.6 | <40(men) & <45 (women) | 32.9 | >=150 |
| Puerto Rico | Cruz-Vidal | 1979 | 1964 |  |  |  |  |  |  |  |  |
| Puerto Rico | Castelli | 1977 | 1965 |  |  |  |  |  |  |  |  |
| Puerto Rico | Costas | 1978 | 1965 |  |  |  |  |  |  |  |  |
| Surinam | Krishnadath | 2016 | 2013 |  |  |  |  |  |  |  |  |
| Trinidad and Tobago | Miljkovic-Gacic | 2006 |  |  |  |  |  |  |  |  |  |
| Trinidad and Tobago | Miller | 1989 | 1979 |  |  |  |  |  |  |  |  |
| Uruguay | Rubinstein | 2015 | 2011 | 31 | >=240 | 31.6 | >=160 | 25.4 | <40 | 15.7 | >=200 |
| US Virgin Islands | Tull | 2005 | 1998 |  |  |  |  | 43.31 | <40(men) & <50 (women) | 14.66 | >=150 |
| US Virgin Islands | Tull | 2013 | 1998 |  |  |  |  |  |  |  |  |
| Venezuela | Uzcategui | 2015 | 2006 |  |  |  |  | 84.2 | <40(men) & <50 (women) | 35.7 | >=150 |
| Venezuela | Salazar | 2018 | 2008 |  |  |  |  |  |  | 27.2 | >=150 |
| Venezuela | Bermudez | 2017 | 2014 |  |  |  |  |  |  | 35 | >=150 |
| Venezuela | Fernandez | 2006 |  |  |  |  |  |  |  |  |  |
| Venezuela | Florez | 2005 | 2000 |  |  |  |  | 65.3 | <40(men) & <50 (women) | 32.3 | >=150 |
| Venezuela | Gonzales-Rivas | 2016 | 2008 |  |  |  |  |  |  |  |  |
| Venezuela | Becerra | 2009 | 2007 | 33 | >=200 |  |  | 76 | <50 | 56 | >=150 |
| Venezuela | Vinueza | 2010 | 2004 | 5.7 | >=240 | 9.8 | mixed with Fr | 52.2 | <40 | 20.2 | >=200 |
| Venezuela | Salas | 2016 | 2006 | 60.8 | >=5.2 |  |  |  |  | 43.5 | >=150 |
| Venezuela | Bermudez | 2013 | 2013 |  |  |  |  | 58 | <40(men) & <50 (women) | 26.6 | >=150 |

Definitions for prevalence estimates are in mg/dl or mmol/l, and as originally reported. For the random-effects meta-analysis, consistent and relevant metrics were pooled (i.e., other were not pooled but presented in the time trends results).

# Supplementary Table 4: Selected lipid clinical guidelines from Latin America and the Caribbean

Statin Eligibility Criteria According to 7 Major Latin American Primary Prevention Guidelines

|  |  |  |  |
| --- | --- | --- | --- |
|  | **Lipid-based (Cholesterol level)** | **Risk-based** | |
| **Age range, y** | **Eligibility** |
| **SUDEAT, Uruguay1** | LDL-C ≥190 mg/dL | NA | DM, LDL-C ≥160 mg/dL with 2 cardiovascular risk factors. |
| **CCSS, Costa Rica 20042** | LDL-C ≥190 mg/dL, HDL-C < 40 mg/dL | Male ≥ 45, Female ≥ 55 | Hypertension (BP ≥ 140/90 mmHg or with antihypertensive treatment), history of early-onset coronary heart disease, first-degree male relative with history of coronary heart disease at age 55 or earlier, first-degree female relative with history of coronary heart disease at age 65 or earlier, smoking history.a |
| **SBC, Brazil 20133** | NA | NA | Familial hypercholesterolemia, CKD or microalbuminuria, metabolic syndrome according to IDF criteria, DM type 1 and type 2, family history of early-onset coronary heart disease,g left ventricular hypertrophy, high sensitivity CRP > 2 mg/L, subclinical atherosclerosis based on diagnostic studies.b |
| **CINETS, Colombia 20144** | LDL-C >190 mg/dL | NA | FRS > 10% predicted 10-y risk of any ASCVD, diabetes mellitus, history of atherosclerotic cardiovascular disease.c |
| **IMSS, Mexico 20165** | LDL-C ≥190 mg/dL | 40-75 | Familial hypercholesterolemia, DM, LDL-C of 100-189 mg/dL with very high cardiovascular riskd, LDL-C of 155-189mg/dL with high cardiovascular risk,e LDL-C of 155-189 mg/dL with moderate cardiovascular risk.f |
| **SAC, Argentina 20186** | LDL-C >190 mg/dL | NA | Familial hypercholesterolemia, moderate CKD (GFR 30-59 mL/min/1,73m2) or severe CKD (GFR less than 30 mL/min/1,73m2) without haemodialysis, DM, cardiovascular ≥20% predicted 10-y risk of any ASCVD, cardiovascular 10-19% predicted 10-y risk of any ASCVD with 1 risk factor or CRP > 2 mg/L, subclinical atheromatosis.g |
| **MINSAL, Chile 20187** | LDL-C >190 mg/dL | NA | DM, CKD stages 3b – 5 or albuminuria, resistant hypertension. |

Abbreviations: SUDEAT, Sociedad Uruguaya de Ateroesclerosis; CCSS, Caja Costarricense del Seguro social; SBC, Sociedade Brasileira de Cardiologia; CINETS, Centro Nacional de Investigación en Evidencia y Tecnologías en Salud; IMSS, Instituto Mexicano del Seguro social; SAC, Sociedad Argentina de Cardiología; MINSAL, Ministerio de Salud de Chile; FRS, Framingham Risk Score; IDF, International Diabetes Federation; ASCVD, atherosclerotic cardiovascular disease; CKD, chronic kidney disease; DM, diabetes mellitus; LDL-C, low-density lipoprotein colesterol; GFR, glomerular filtration rate; CRP, C-reactive protein.

a For primary prevention: 0-1 risk factors.

b Carotid intima-media thickness >1, coronary calcium score >100 or > 75th percentile for sex and age, ankle-brachial index <0.9.

c Acute coronary events such as acute myocardial infarction (AMI) and stable or unstable angina, cerebrovascular accident (CVA), transitory ischemic attack (TIA), history of previous revascularization (coronary or other site), or lower extremity atherosclerotic vascular disease.

d Established cardiovascular disease by imaging, history of AMI, coronary revascularization or any other revascularization method, ischemic-type cerebrovascular event, DM type 2 or 1 with target organ damage, moderate to severe GFR decrease (< 60 ml/min/1.73 m2), Globorisk > 10% predicted 10-y risk of any ASCVD.

e Globorisk 5-10% predicted 10-y risk of any ASCVD; markedly elevated risk factors such as uncontrolled blood pressure (blood pressure ≥180/10mmHg), uncontrolled dyslipidaemia (total cholesterol > 310mg/dL) or with primary familial hypercholesterolemia.

f Globorisk 1-5% predicted 10-y risk of any ASCVD.

g Significant peripheral arterial plaque (carotid, femoral or aortic), coronary calcium score > 75th percentile or > 300 units Agatston, coronary plaque on angiotomography.

1. Sociedad Uruguaya de Aterosclerosis. Segundo consenso uruguayo sobre dislipidemias.
2. Caja Costarricense de Seguro social. Guías para la detección, el diagnóstico y el tratamiento de las dislipidemias para el primer nivel de atención; 2004
3. Xavier HT, Izar MC, Faria JR, Assad MH, Rocha VZ, Sposito AC, et al. V Diretriz Brasileira de Dislipidemias e Prevenção da Aterosclerose. Sociedade Brasileira de Cardiologia. 2013; 101(4)
4. Centro Nacional de Investigación en Evidencia y Tecnologías en Salud CINETS. Guía de práctica clínica para la prevención, detección temprana, diagnóstico, tratamiento y seguimiento de las dislipidemias en la población mayor de 18 años; 2014
5. Instituto Mexicano del Seguro Social. Diagnóstico y tratamiento de DISLIPIDEMIAS (HIPERCOLESTEROLEMIA) en el adulto; 2016
6. Sociedad Argentina de Cardiología. Uso apropiado de las estatinas en la Argentina, Documento de posición. Revista Argentina de Cardiología. 2018; 86(1)
7. Ministerio de Salud de Chile. Orientación técnica Dislipidemias; 2018

# Supplementary Table 5: Country classification into sub-regions

|  |  |  |
| --- | --- | --- |
| **ISO3 Code** | **Country** | **Sub-Region** |
| ARG | Argentina | Southern and Tropical Latin America |
| ATG | Antigua and Barbuda | Caribbean |
| BHS | Bahamas | Caribbean |
| BLZ | Belize | Caribbean |
| BMU | Bermuda | Caribbean |
| BOL | Bolivia | Andean Latin America |
| BRA | Brazil | Southern and Tropical Latin America |
| BRB | Barbados | Caribbean |
| CHL | Chile | Southern and Tropical Latin America |
| COL | Colombia | Central Latin America |
| CRI | Costa Rica | Central Latin America |
| CUB | Cuba | Caribbean |
| DMA | Dominica | Caribbean |
| DOM | Dominican Republic | Caribbean |
| ECU | Ecuador | Andean Latin America |
| GRD | Grenada | Caribbean |
| GTM | Guatemala | Central Latin America |
| GUY | Guyana | Caribbean |
| HND | Honduras | Central Latin America |
| HTI | Haiti | Caribbean |
| JAM | Jamaica | Caribbean |
| KNA | Saint Kitts and Nevis | Caribbean |
| LCA | Saint Lucia | Caribbean |
| MEX | Mexico | Central Latin America |
| NIC | Nicaragua | Central Latin America |
| PAN | Panama | Central Latin America |
| PER | Peru | Andean Latin America |
| PRI | Puerto Rico | Caribbean |
| PRY | Paraguay | Southern and Tropical Latin America |
| SLV | El Salvador | Central Latin America |
| SUR | Suriname | Caribbean |
| TTO | Trinidad and Tobago | Caribbean |
| URY | Uruguay | Southern and Tropical Latin America |
| VCT | Saint Vincent and the Grenadines | Caribbean |
| VEN | Venezuela | Central Latin America |

Classification based on NCD-RisC sub-regions: <http://ncdrisc.org/>

1. Hoy D, Brooks P, Woolf A, et al. Assessing risk of bias in prevalence studies: modification of an existing tool and evidence of interrater agreement. Journal of clinical epidemiology 2012; 65(9): 934-9. [↑](#footnote-ref-1)