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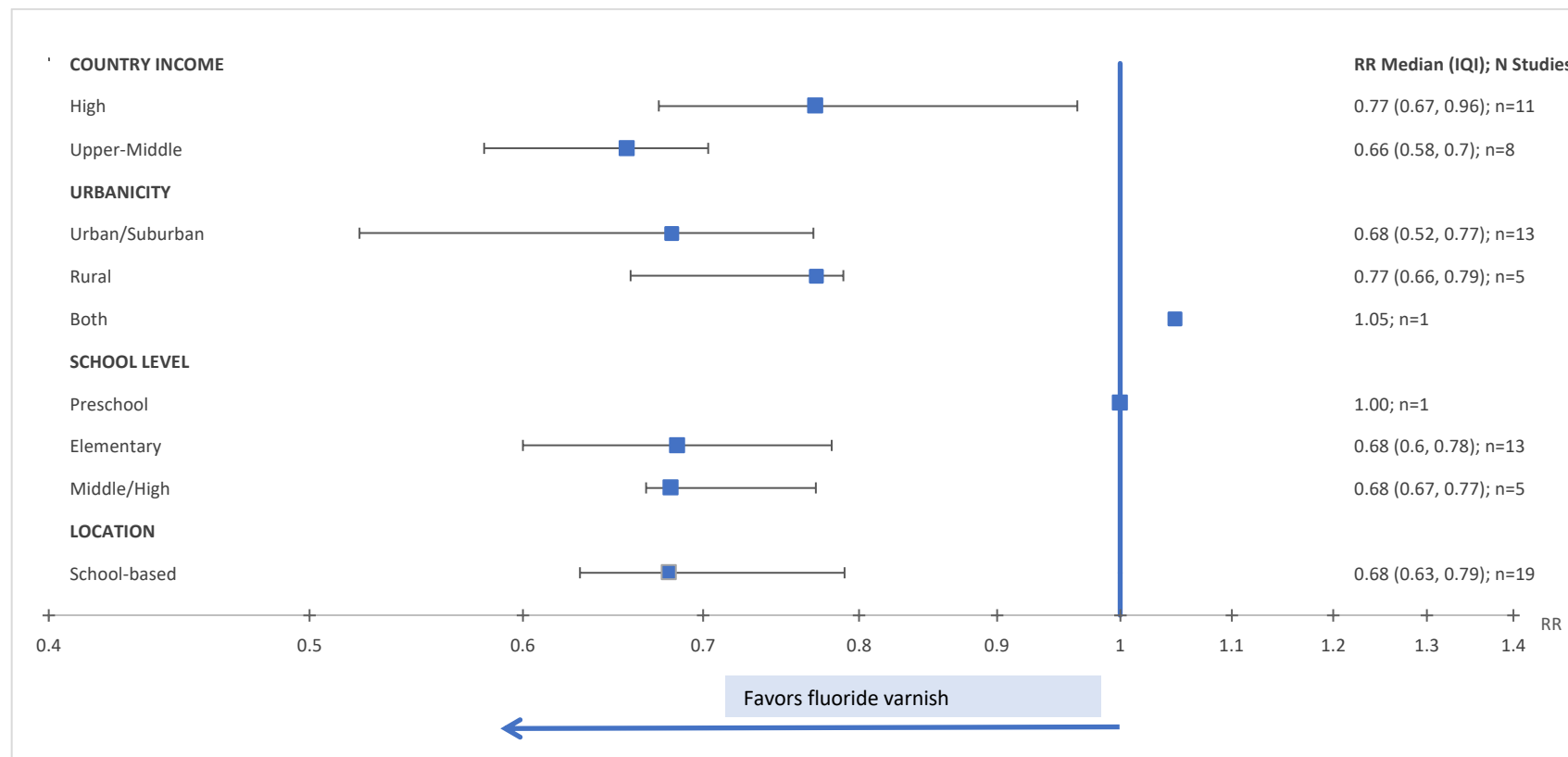
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7

8 **Appendix Figure 1.** Effectiveness of SFVDP relative to no program on caries initiation in permanent teeth, stratified by setting
 9 characteristics

10

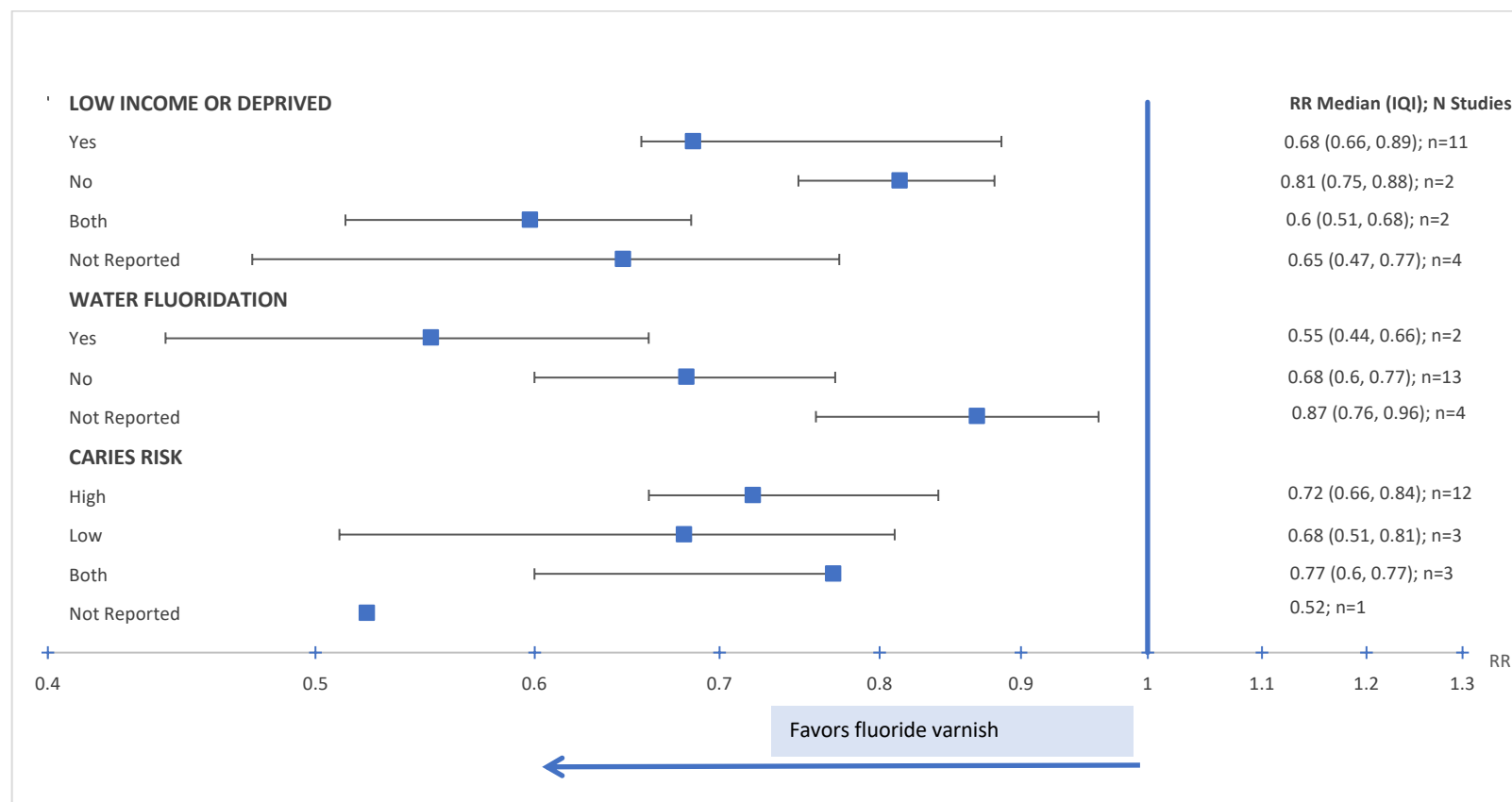


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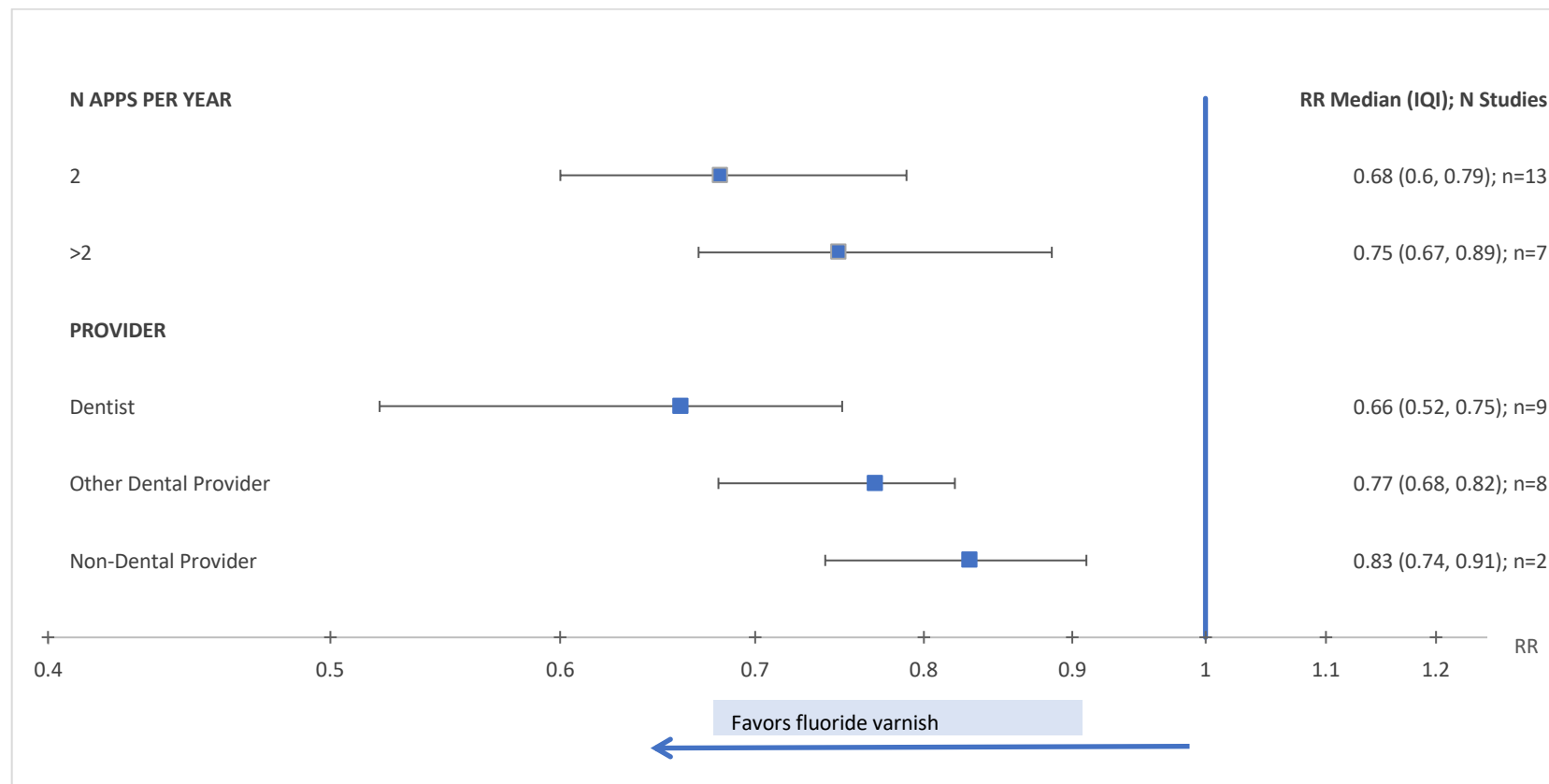
13 RR: Relative risk/ratio. IQI: Inter-quartile interval. n: Number of studies. SFVDP: School fluoride varnish delivery programs.

Appendix Figure 2. Effectiveness of SFVDP relative to no program on caries initiation in permanent teeth, stratified by population characteristics



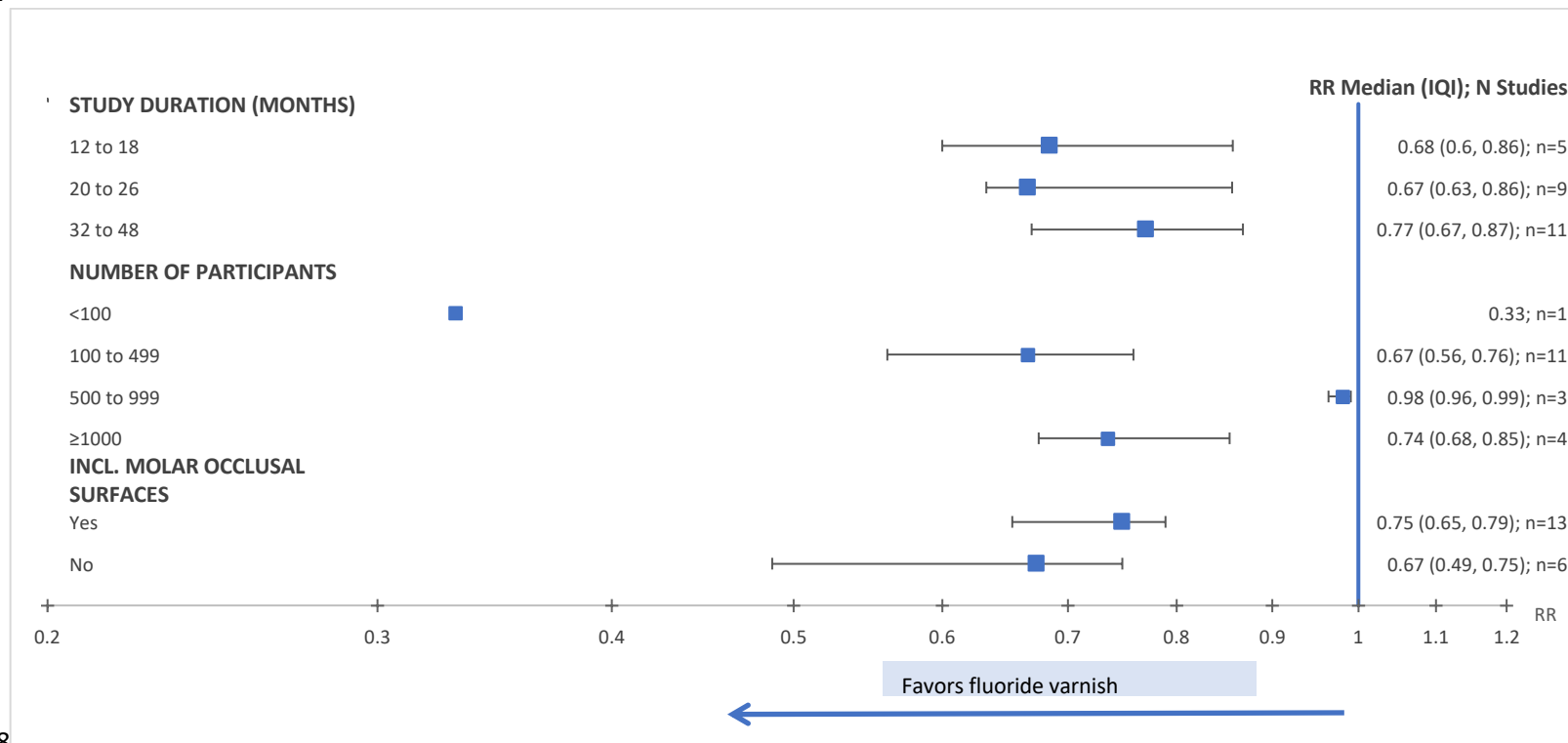
RR: Relative risk/ratio. IQI: Inter-quartile interval. n: Number of studies. SFVDP: School fluoride varnish delivery programs.

20 **Appendix Figure 3.** Effectiveness of SFVDP relative to no program on caries initiation in permanent teeth stratified by Intervention
 21 characteristics
 22



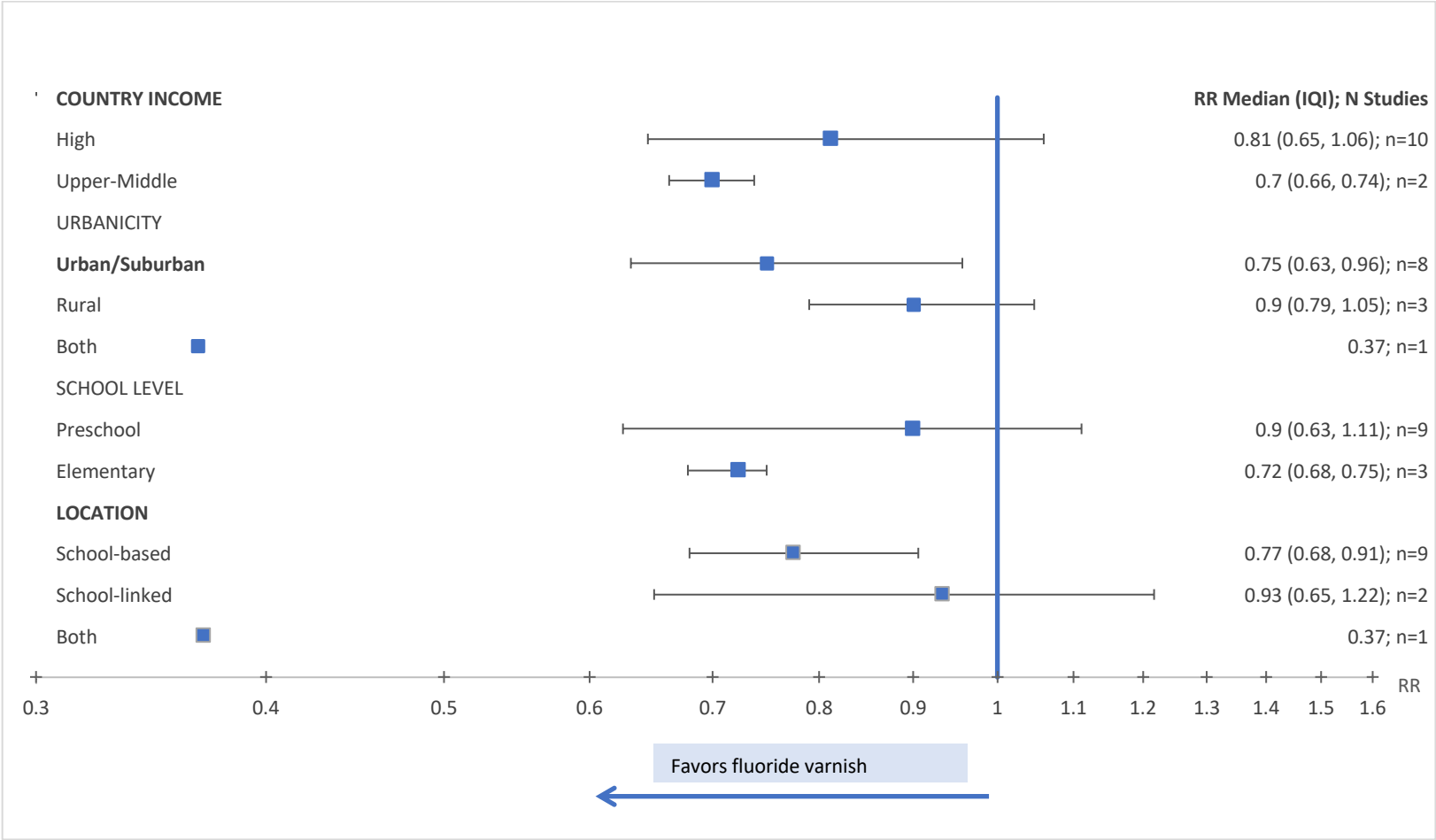
23
 24
 25 RR: Relative risk/ratio. IQI: Inter-quartile interval. n: Number of studies. SFVDP: School fluoride varnish delivery programs.

26 **Appendix Figure 4.** Effectiveness of SFVDP relative to no program on caries initiation in permanent teeth, stratified by study characteristics
 27



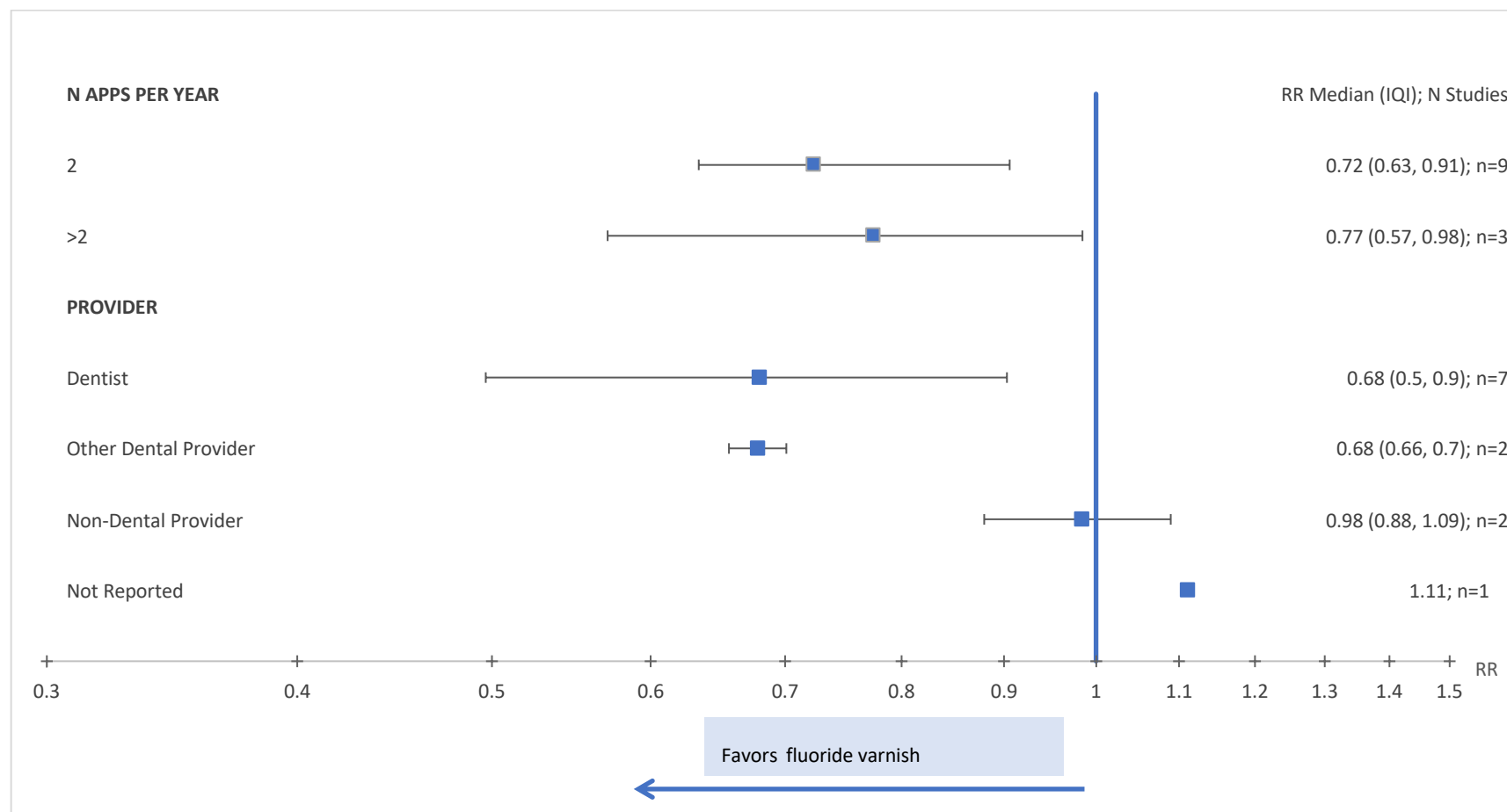
28
 29
 30 RR: Relative risk/ratio. IQI: Inter-quartile interval. n: Number of studies. SFVDP: School fluoride varnish delivery programs.

31 **Appendix Figure 5.** Effectiveness of SFVDP relative to no program on caries initiation in primary dentition, stratified by setting
32 characteristics
33



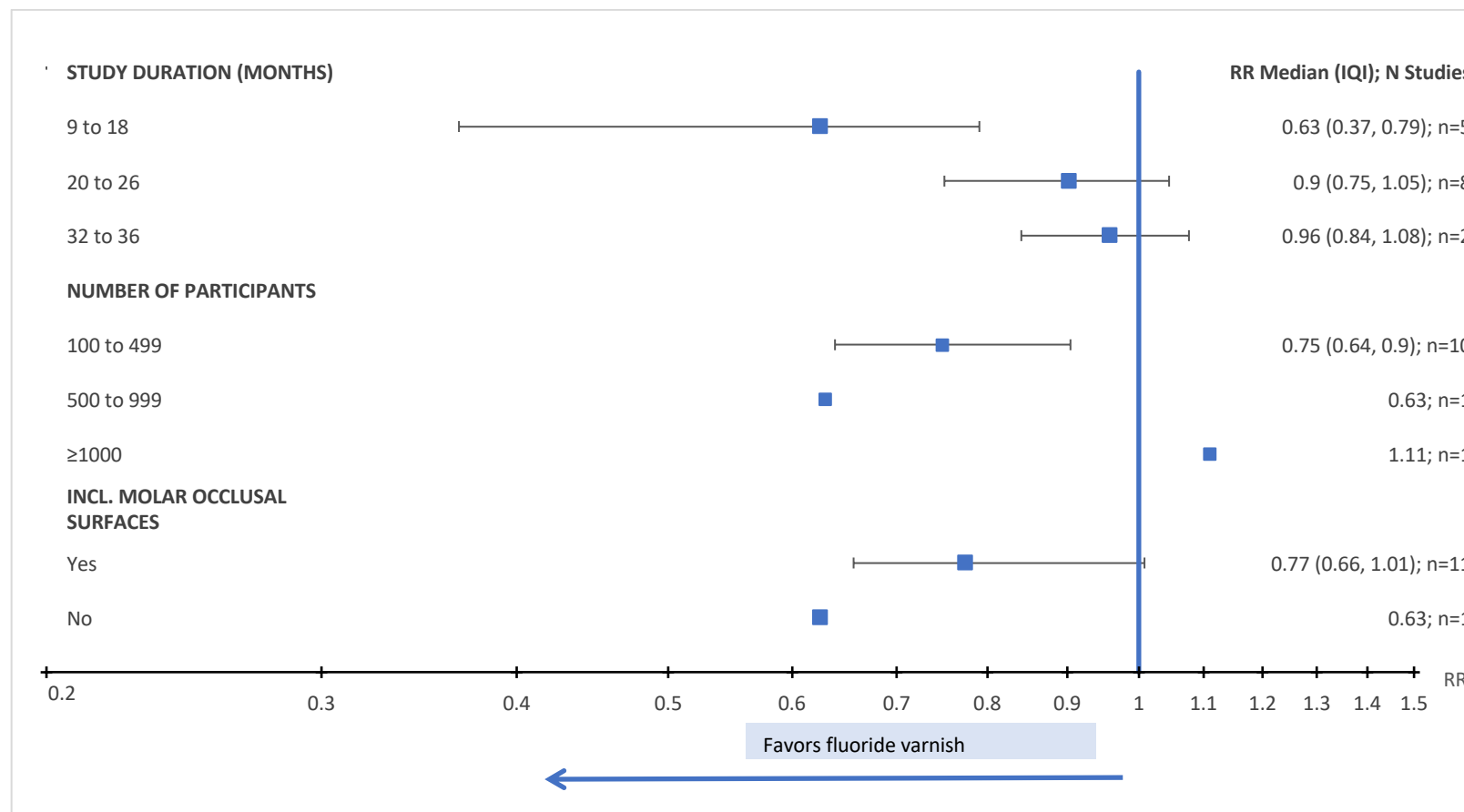
34
35
36 RR: Relative risk/ratio. IQI: Inter-quartile interval. n: Number of studies. SFVDP: School fluoride varnish delivery programs.

Appendix Figure 6. Effectiveness of SFVDP relative to no program on caries initiation in primary dentition, stratified by intervention characteristics



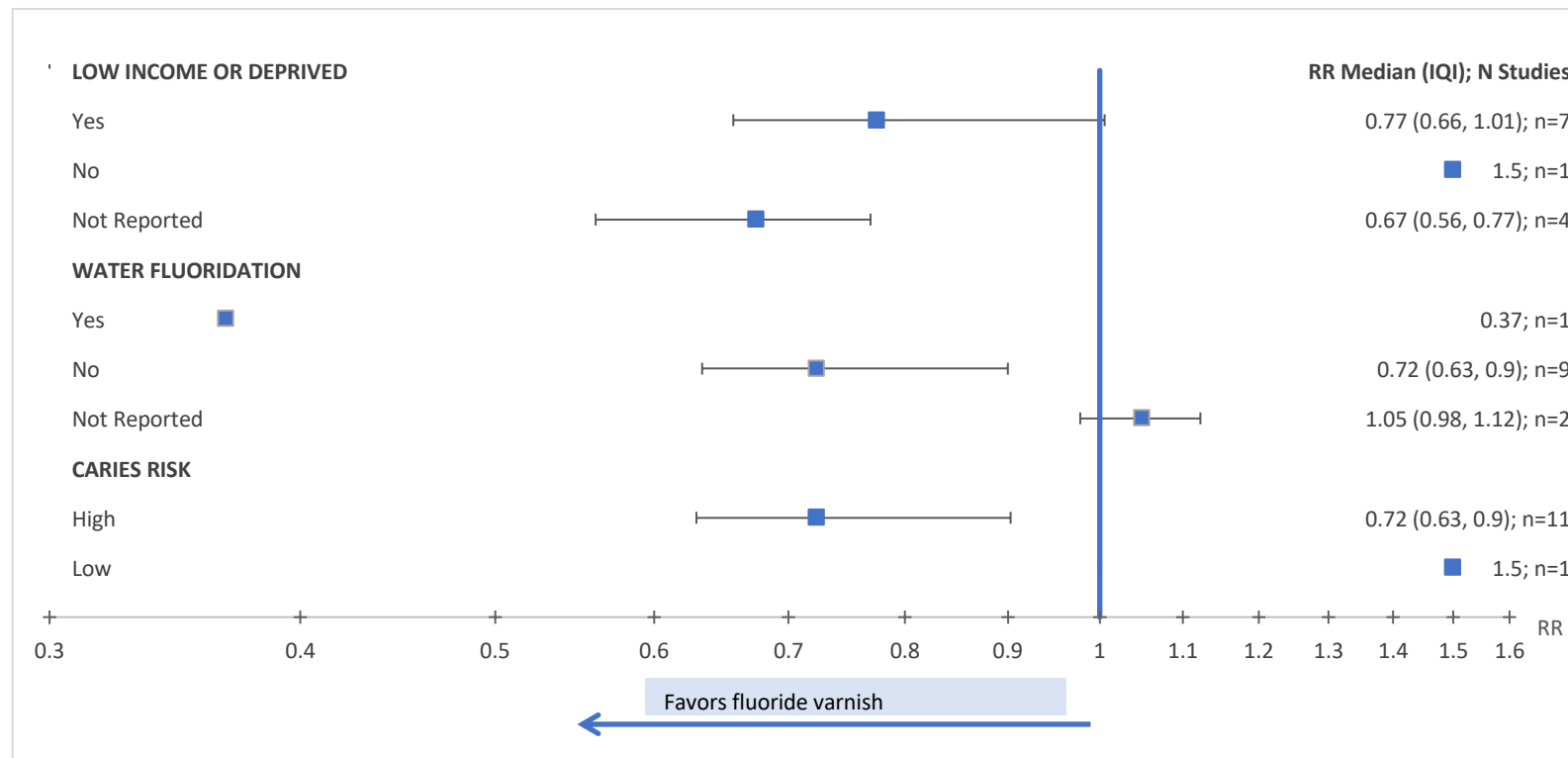
RR: Relative risk/ratio. IQI: Inter-quartile interval. n: Number of studies. SFVDP: School fluoride varnish delivery programs.

Appendix Figure 7. Effectiveness of SFVDP relative to no program on caries initiation in primary teeth, stratified by study characteristics



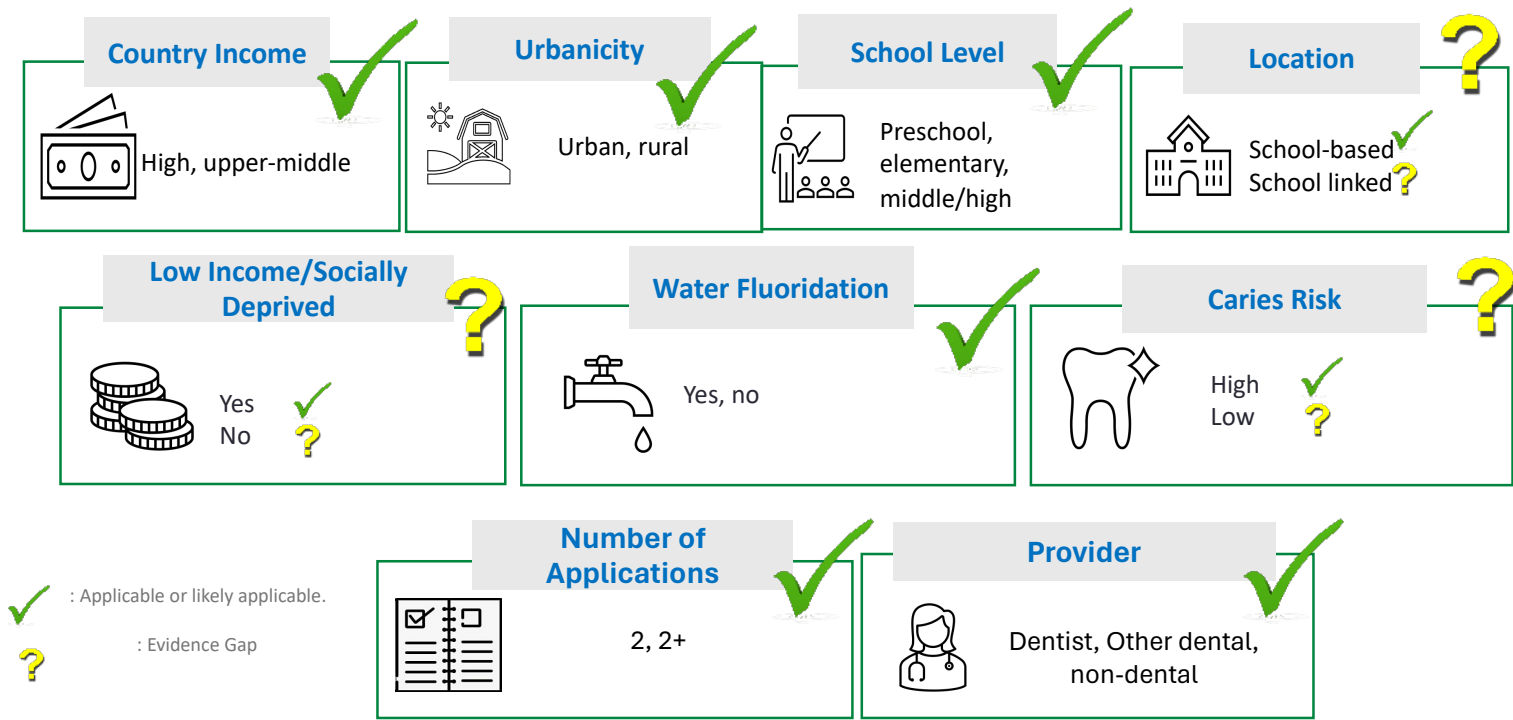
RR: Relative risk/ratio. IQI: Inter-quartile interval. n: Number of studies. SFVDP: School fluoride varnish delivery programs.

Appendix Figure 8. Effectiveness of SFVDP relative to no program on caries initiation in primary dentition, stratified by population characteristics



RR: Relative risk/ratio. IQI: Inter-quartile interval. n: Number of studies. SFVDP: School fluoride varnish delivery programs.

60 **Appendix Figure 9.** Applicability of findings by characteristics



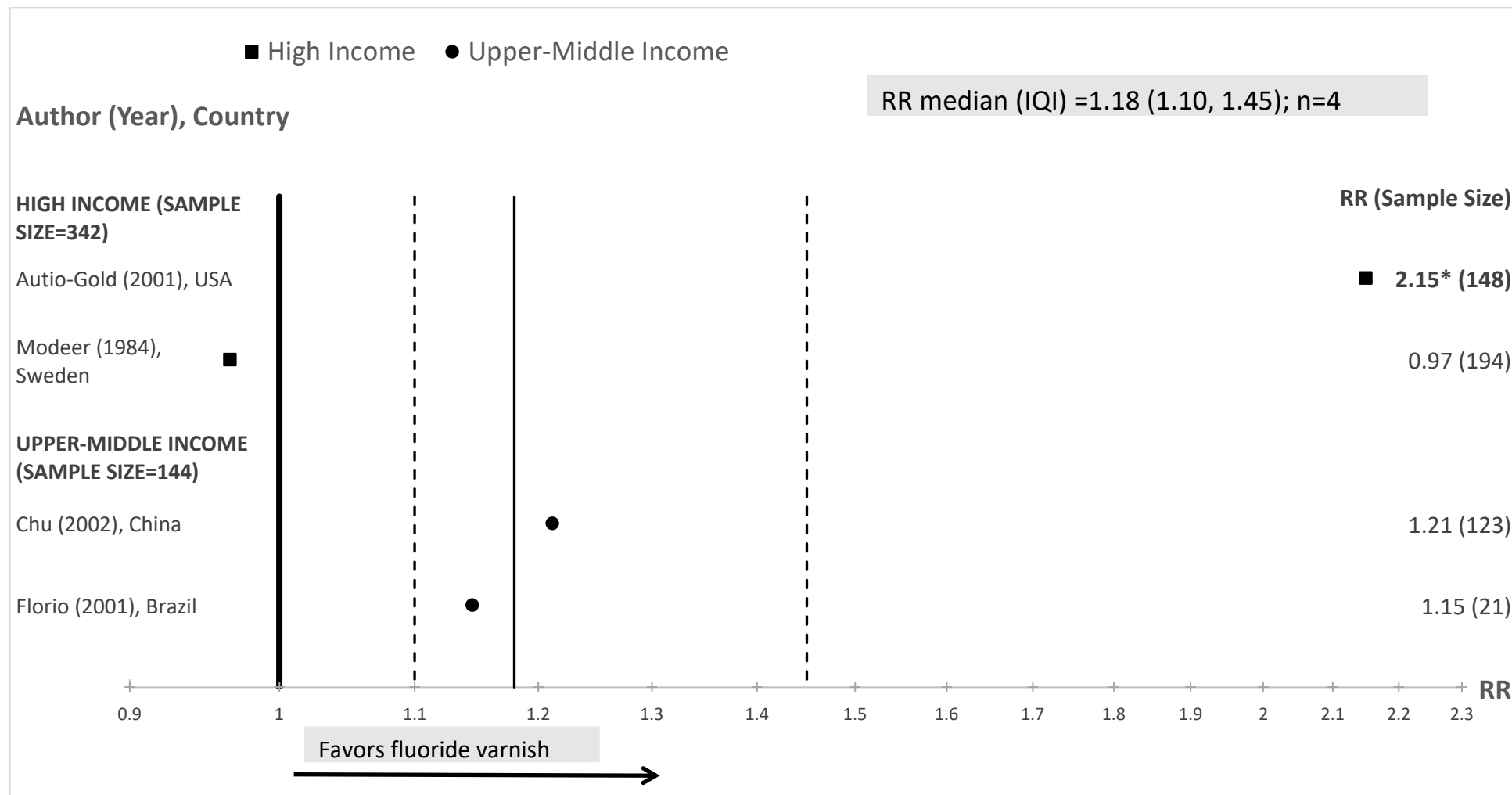
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65 **Appendix Figure 10.** Effectiveness of SFVDP relative to no program on caries regression/arrestment



66

67 RR: Relative risk/ratio. IQI: Inter-quartile interval. n: Number of studies. SFVDP: School fluoride varnish delivery programs.

68 X-axis is in log scale. Thin solid bar represents the median and dashed bars the IQI.

69 * Significant effect at $p < 0.05$ for difference in incidence or increment for SFVDP vs control.

70

71 **Appendix Table 1.** Studies excluded from review after abstraction and primary reason for exclusion

- 72 1. Agarwal D, Kumar A, Ghanghas M, Bc M, Yadav V. Effectiveness of Fluoride Varnish in Prevention of Early Childhood Caries in 3-4
73 Years Old Children - A 36 Month Prospective Community Based Randomized Controlled Trial. J Clin Pediatr Dent 2022;46(2):125-131.
74 (Setting)
- 75 2. Agouropoulos A, Twetman S, Pandis N, Kavvadia K, Papagiannoulis L. Caries-preventive effectiveness of fluoride varnish as adjunct
76 to oral health promotion and supervised tooth brushing in preschool children: a double-blind randomized controlled trial. Journal of Dentistry
77 2014;42(10):1277-83. ((FV<5%))
- 78 3. Amend S, Hartmann T, Heinzl-Gutenbrunner M, Frankenberger R, Krämer N, Winter J. Caries Experience and Increment in
79 Children Attending Kindergartens with an Early Childhood Caries Preventive Program Compared to Basic Prophylaxis Measures-A
80 Retrospective Cohort Study. J Clin Med 2022;11(10). (Eligible control)
- 81 4. Axelsson P, Paulander J, Nordkvist K, Karlsson R. Effect of fluoride containing dentifrice, mouthrinsing, and varnish on approximal
82 dental caries in a 3-year clinical trial. Community Dentistry & Oral Epidemiology 1987;15(4):177-80. (FV<5%)
- 83 5. Bhardwaj A, Ramoni R, Kalenderian E, Neumann A, Hebballi NB, White JM, et al. Measuring up: Implementing a dental quality
84 measure in the electronic health record context. Journal of the American Dental Association 2016;147(1):35-40. (Setting)
- 85 6. Bonetti D, Clarkson JE. Fluoride Varnish for Caries Prevention: Efficacy and Implementation. Caries Research 2016;50 Suppl 1:45-9.
86 (Protocol/review only)
- 87 7. Bryant LL, Quissell DO, Braun PA, Henderson WG, Johs N, George C, et al. A Community-Based Oral Health Intervention in Navajo
88 Nation Head Start: Participation Factors and Contextual Challenges. Journal of Community Health 2016;41(2):340-53. (Eligible control)
- 89 8. Buckingham S, John JH. Recruitment and participation in pre-school and school-based fluoride varnish pilots - the South Central
90 experience. British Dental Journal 2013;215(5):E8. (Eligible control)
- 91 9. Burgess-Allen J, Braithwaite M, Whiston S. Challenges associated with implementation of a school-based tooth-brushing and fluoride
92 varnish programme in a diverse and transient urban population. Community Dental Health 2018;35(2):71-74. (Isolate effect)
- 93 10. Chestnutt IG, Hutchings S, Playle R, Morgan-Trimmer S, Fitzsimmons D, Aawar N, et al. Seal or Varnish? A randomised controlled
94 trial to determine the relative cost and effectiveness of pit and fissure sealant and fluoride varnish in preventing dental decay. Health
95 Technology Assessment (Winchester, England) 2017;21(21):1-256. (Eligible control)
- 96 11. Chestnutt IG, Playle R, Hutchings S, Morgan-Trimmer S, Fitzsimmons D, Aawar N, et al. Fissure Seal or Fluoride Varnish? A
97 Randomized Trial of Relative Effectiveness. Journal of Dental Research 2017;96(7):754-761. (Eligible control)

- 98 12. Dimitropoulos Y, Blinkhorn A, Irving M, Skinner J, Naoum S, Holden A, et al. Enabling Aboriginal dental assistants to apply fluoride
99 varnish for school children in communities with a high Aboriginal population in New South Wales, Australia: a study protocol for a
100 feasibility study. *Pilot & Feasibility Studies* 2019;5:15. (Protocol/review only)
- 101 13. Dimitropoulos Y, Gwynne K, Blinkhorn A, Holden A. A school fluoride varnish program for Aboriginal children in rural New South
102 Wales, Australia. *Health Promotion Journal of Australia* 2020;31(2):172-176. (Eligible control)
- 103 14. Dimitropoulos Y, Holden A, Gwynne K, Do L, Byun R, Sohn W. Outcomes of a co-designed, community-led oral health promotion
104 program for Aboriginal children in rural and remote communities in New South Wales, Australia. *Community Dental Health* 2020;37(2):132-
105 137. (Isolate effect)
- 106 15. Dohnke-Hohrmann S, Zimmer S. Change in caries prevalence after implementation of a fluoride varnish program. *Journal of Public
107 Health Dentistry* 2004;64(2):96-100. (Eligible control)
- 108 16. Duangthip D, Chu CH, Lo EC. A randomized clinical trial on arresting dentine caries in preschool children by topical fluorides--18
109 month results. *Journal of Dentistry* 2016;44:57-63. (Eligible control)
- 110 17. Duangthip D, Wong MCM, Chu CH, Lo ECM. Caries arrest by topical fluorides in preschool children: 30-month results. *Journal of
111 Dentistry* 2018;70:74-79. (Eligible control)
- 112 18. Evans P, Pearson N, Simons D. A school-based oral health intervention in East London: the Happy Teeth fluoride varnish programme.
113 *British Dental Journal* 2013;215(8):E14. (Eligible control)
- 114 19. Garcia RI, Gregorich SE, Ramos-Gomez F, Braun PA, Wilson A, Albino J, et al. Absence of Fluoride Varnish-Related Adverse
115 Events in Caries Prevention Trials in Young Children, United States. *Preventing Chronic Disease* 2017;14:E17. (Measurement)
- 116 20. Garcia-Hoyos F, Barberia E, Garcia-Camba P, Varela M. Renal fluoride excretion in children following topical application of fluoride
117 varnish. *European Journal of Paediatric Dentistry* 2012;13(4):280-4. (Measurement)
- 118 21. Gugwad SC, Shah P, Lodaya R, Bhat C, Tandon P, Choudhari S, Patil S. Caries prevention effect of intensive application of sodium
119 fluoride varnish in molars in children between age 6 and 7 years. *Journal of Contemporary Dental Practice [Electronic Resource]*
120 2011;12(6):408-13. (Setting)
- 121 22. Hamp SE, Johansson LA, Karlsson R. Clinical effects of preventive regimens for young people in their early and middle teens in
122 relation to previous experience with dental prevention. *Acta Odontologica Scandinavica* 1984;42(2):99-108. (Eligible control)
- 123 23. Holm AK. Effect of fluoride varnish (Duraphat) in preschool children. *Community Dentistry & Oral Epidemiology* 1979;7(5):241-5.
124 (Setting)

- 125 24. Honkala S, ElSalhy M, Shyama M, Al-Mutawa SA, Boodai H, Honkala E. Sealant versus Fluoride in Primary Molars of Kindergarten
126 Children Regularly Receiving Fluoride Varnish: One-Year Randomized Clinical Trial Follow-Up. *Caries Research* 2015;49(4):458-66.
127 (Isolate effect)
- 128 25. Huber C, Baran S, de Graaff C, Howell M, Patterson S, Figueiredo R. Redirecting public oral health fluoride varnish intervention to
129 low socio-economic status children in Alberta. *Canadian Journal of Public Health. Revue Canadienne de Sante Publique* 2017;108(3):e273-
130 e278. (Eligible control)
- 131 26. Ibricevic H, Honkala S, Honkala E, Al-Quraini W. A field trial on semi-annual fluoride varnish applications among the special needs
132 schoolchildren. *Journal of Clinical Pediatric Dentistry* 2005;30(2):135-8. (Quality of execution)
- 133 27. Jablonski-Momeni A, Winter J, Petrakakis P, Schmidt-Schafer S. Caries prevalence (ICDAS) in 12-year-olds from low caries
134 prevalence areas and association with independent variables. *International Journal of Paediatric Dentistry* 2014;24(2):90-7. (Measurement)
- 135 28. Keller MK, Klausen BJ, Twetman S. Fluoride varnish or fluoride mouth rinse? A comparative study of two school-based programs.
136 *Community Dental Health* 2016;33(1):23-6. (Eligible control)
- 137 29. Kirkegaard E, Petersen G, Polusen S, Holm SA, Heidmann J. Caries-preventive effect of duraphat® varnish applications versus
138 fluoride mouthrinses: 5-year data. *Caries Research* 1986;20(6):548-555. (Eligible control)
- 139 30. Koch G, Petersson LG, Ryden H. Effect of fluoride varnish (Duraphat) treatment every six months compared with weekly
140 mouthrinses with 0.2 per cent NaF solution on dental caries. *Swedish Dental Journal* 1979;3(2):39-44. (Eligible control)
- 141 31. Lalloo R, Tadakamadla SK, Kroon J, Jamieson LM, Ware RS, Johnson NW. Carious lesions in permanent dentitions are reduced in
142 remote Indigenous Australian children taking part in a non-randomised preventive trial. *PLoS ONE [Electronic Resource]*
143 2021;16(1):e0244927. (Isolate effect)
- 144 32. Latifi-Xhemajli B, Begzati A, Veronneau J, Kutllovci T, Rexhepi A. Effectiveness of fluoride varnish four times a year in preventing
145 caries in the primary dentition: A 2 year randomized controlled trial. *Community Dental Health* 2019;36(2):190-194. ((FV<5%))
- 146 33. Luksamijarulkul N, Pongpanich S, Panza A. Protective factors for caries of a school-based oral health program in Bangkok, Thailand:
147 a retrospective cohort study. *Public Health* 2020;187:53-58. (Measurement)
- 148 34. Mabangkhru S, Duangthip D, Chu CH, Phonghanyudh A, Jirarattanasopha V. A randomized clinical trial to arrest dentin caries in
149 young children using silver diamine fluoride. *Journal of Dentistry* 2020;99:103375. (Eligible control)

- 150 35. Mathu-Muju KR, McLeod J, Walker ML, Chartier M, Harrison RL. The Children's Oral Health Initiative: An intervention to address
151 the challenges of dental caries in early childhood in Canada's First Nation and Inuit communities. Canadian Journal of Public Health. Revue
152 Canadienne de Sante Publique 2016;107(2):e188-e193. (Setting)
- 153 36. Mohammadi TM, Hajizamani A, Hajizamani HR, Abolghasemi B. Fluoride varnish effect on preventing dental caries in a sample of
154 3-6 years old children. Journal of International Oral Health 2015;7(1):30-5. (Follow-up)
- 155 37. Murray JJ, Winter GB, Hurst CP. Duraphat fluoride varnish. A 2-year clinical trial in 5-year-old children. British Dental Journal
156 1977;143(1):11-7. (Split mouth)
- 157 38. Paige CJ, Shahid SK. Developing and implementing a fluoride varnish programme for young children in Bradford, UK. Community
158 Dental Health 2014;31(1):5-8. (Eligible control)
- 159 39. Pieper K, Weber K, Margraf-Stiksrud J, Heinzl-Gutenbrunner M, Stein S, Jablonski-Momeni A. Evaluation of a preventive program
160 aiming at children with increased caries risk using ICDAS II criteria. Clinical Oral Investigations 2013;17(9):2049-55. (Measurement)
- 161 40. Pieper K, Weber K, Margraf-Stiksrud J, Stein S, Heinzl-Gutenbrunner M, Jablonski-Momeni A. Evaluation of an intensified
162 preventive programme aimed at 12-year-olds with increased caries risk. Journal of Public Health (Germany) 2012;20(2):151-157.
163 (Measurement)
- 164 41. Ricks TL, Phipps KR, Bruerd B. The Indian Health Service Early Childhood Caries Collaborative: A Five-year Summary. Pediatric
165 Dentistry 2015;37(3):275-80. (Setting)
- 166 42. Rodakowska E, Wilczynska-Borawska M, Baginska J. Evaluation of effectiveness of preventive procedures in 7-year old children in
167 Bialystok, Poland. HealthMED 2012;6(12):3929-3936. (FV<5%)
- 168 43. Salem K, Shahsavari F, Kazemnejad E, Poorhabibi Z. Pit and Fissure Sealant Versus Fluoride Varnish In Prevention of Occlusal
169 Caries. Journal of Dentomaxillofacial Radiology, Pathology and Surgery 2014;3(1):37-47. (Eligible control)
- 170 44. Shobha T, Nandlal B, Prabhakar AR, Sudha P. Fluoride varnish versus acidulated phosphate fluoride for schoolchildren in Manipal.
171 Journal of the Indian Dental Association 1987;59(6,7,8,9):157-60. (Eligible control)
- 172 45. Simmer-Beck M, Gadbury-Amyot CC, Ferris H, Voelker MA, Keselyak NT, Eplee H, et al. Extending oral health care services to
173 underserved children through a school-based collaboration: part 1: a descriptive overview. Journal of Dental Hygiene 2011;85(3):181-92.
174 (Eligible control)
- 175 46. Simons D, Pearson N, Evans P. A pilot of a school-based dental treatment programme for vulnerable children with possible dental
176 neglect: the Back2School programme. British Dental Journal 2013;215(8):E15. (Eligible control)

- 177 47. Skinner J, Dimitropoulos Y, Masoe A, Yaacoub A, Byun R, Rambaldini B, et al. Aboriginal dental assistants can safely apply fluoride
178 varnish in regional, rural and remote primary schools in New South Wales, Australia. *Australian Journal of Rural Health* 2020;28(5):500-505.
179 (Eligible control)
- 180 48. Slade GD, Bailie RS, Roberts-Thomson K, Leach AJ, Raye I, Endean C, et al. Effect of health promotion and fluoride varnish on
181 dental caries among Australian Aboriginal children: results from a community-randomized controlled trial. *Community Dentistry & Oral*
182 *Epidemiology* 2011;39(1):29-43. (Setting)
- 183 49. Sokal-Gutierrez K, Turton B, Husby H, Paz CL. Early childhood caries and malnutrition: Baseline and two-year follow-up results of a
184 community-based prevention intervention in Rural Ecuador. *BMC Nutrition* 2016;2(1). (Setting)
- 185 50. Suwansingha O, Rirattanapong P. Effect of fluoride varnish on caries prevention of partially erupted of permanent molar in high caries
186 risk. *Southeast Asian Journal of Tropical Medicine & Public Health* 2012;43(3):808-13. (Split mouth)
- 187 51. Tirupathi S, Svsg N, Rajasekhar S, Nuvvula S. Comparative cariostatic efficacy of a novel Nano-silver fluoride varnish with 38%
188 silver diamine fluoride varnish a double-blind randomized clinical trial. *Journal of Clinical & Experimental Dentistry* 2019;11(2):e105-e112.
189 (Isolate effect)
- 190 52. Turner S, Brewster L, Kidd J, Gnich W, Ball GE, Milburn K, et al. Childsmile: the national child oral health improvement programme
191 in Scotland. Part 2: Monitoring and delivery. *British Dental Journal* 2010;209(2):79-83. (Eligible control)
- 192 53. van Eck AA, Theuns HM, Groeneveld A. Effect of annual application of polyurethane lacquer containing silane-fluoride. *Community*
193 *Dentistry & Oral Epidemiology* 1984;12(4):230-2. (Setting)
- 194 54. Whelton HP. Fluorosis prevalence among German schoolchildren may not be associated with early kindergarten-based preventive
195 programmes. *Journal of Evidence Based Dental Practice* 2009;9(1):25-27. (Protocol/review only)
- 196 55. Winter J, Weber K, Martin K, Heinzl-Gutenbrunner M, Pieper K. Evaluation of an intensified prevention program for 4th graders
197 with increased caries risk using ICDAS. *International Journal of Paediatric Dentistry* 2016;26(4):250-8. (Measurement)
- 198 56. Wolff MS, Hill R, Wilson-Genderson M, Hirsch S, Dasanayake AP. Nationwide 2.5-Year School-Based Public Health Intervention
199 Program Designed to Reduce the Incidence of Caries in Children of Grenada. *Caries Research* 2016;50 Suppl 1:68-77. (Measurement)
- 200 57. Wright W, Turner S, Anopa Y, McIntosh E, Wu O, Conway DI, et al. Comparison of the caries-protective effect of fluoride varnish
201 with treatment as usual in nursery school attendees receiving preventive oral health support through the Childsmile oral health improvement
202 programme - the Protecting Teeth@3 Study: a randomised controlled trial. *BMC Oral Health* 2015;15:160. (Protocol/review only)

- 203 58. Xhemnica L, Sulo D, Rroco R, Hysi D. Fluoride varnish application: a new prophylactic method in Albania. Effect on enamel carious
204 lesions in permanent dentition. *European Journal of Paediatric Dentistry* 2008;9(2):93-6. (Isolate effect)
- 205 59. Ying Lam PP, Sardana D, Luo W, Ekambaram M, Man Lee GH, Man Lo EC, Yung Yiu CK. Glass Ionomer Sealant versus Fluoride
206 Varnish Application to Prevent Occlusal Caries in Primary Second Molars among Preschool Children: A Randomized Controlled Trial.
207 *Caries Research* 2021;55(4):322-332. (Eligible control)
- 208 60. Yusuf H, Wright K, Robertson C. Evaluation of a pilot oral health promotion programme 'Keep Smiling': perspectives from GDPs,
209 health champions and school staff. *British Dental Journal* 2015;218(8):455-9. (Eligible control)
- 210 61. Zimmer S, Bizhang M, Seemann R, Witzke S, Roulet JF. The effect of a preventive program, including the application of low-
211 concentration fluoride varnish, on caries control in high-risk children. *Clinical Oral Investigations* 2001;5(1):40-4. ((FV<5%))
- 212
- 213 Definitions: Follow-up=follow-up < 9 months; Ineligible control=control received treatment that FV group did not or there was no prior to
214 program baseline or concurrent comparison; Isolate effect=FV group received treatment in addition to FV OR confounding event;
215 Measurement=could not estimate effect due to no baseline and/or follow-up outcome data; Setting=indeterminate or not school; split
216 mouth=treatment and control in same mouth

Appendix Table 2. Articles included in review¹

1. Abreu-Placeres N, Garrido LE, Castillo Jaquez I, et al. Does applying fluoride varnish every three months better prevent caries lesions in erupting first permanent molars? A randomised clinical trial. *Oral Health Prev Dent.* 2019;17:541-546.
2. Arruda AO, Senthamarai Kannan R, Inglehart MR, et al. Effect of 5% fluoride varnish application on caries among school children in rural Brazil: a randomized controlled trial. *Community Dent Oral Epidemiol.* 2012;40(3):267-76.
3. Autio-Gold JT and Courts F. Assessing the effect of fluoride varnish on early enamel carious lesions in the primary dentition. *J Am Dent Assoc.* 2021;32(9):1247-53.
4. Bergstrom EK, Birkhed D, Granlund C, et al. Approximal caries increment in adolescents in a low caries prevalence area in Sweden after a 3.5-year school-based fluoride varnish programme with Bifluorid 12 and Duraphat. *Community Dent Oral Epidemiol.* 2014;42(5):404-11 2014.
5. Bergstrom EK, Lingstrom P, Hakeberg M, et al. Caries and costs: an evaluation of a school-based fluoride varnish programme for adolescents in a Swedish region. *Swed Dent J.* 2016;40(2):181-190.
6. Braun PA, Quissell DO, Henderson WG, et al. A cluster-randomized, community-based, tribally delivered oral health promotion trial in Navajo Head Start children. *J Dent Res.* 2016;95(11):1237-44.
7. Bravo M, Garcia-Anllo I, Baca P, et al. A 48-month survival analysis comparing sealant (Delton) with fluoride varnish (Duraphat) in 6- to 8-year-old children. *Community Dent Oral Epidemiol.* 1997;25(3):247-50.
8. (Bravo study) Bravo M, Baca P, Llodra JC, Osorio E. A 24-month study comparing sealant and fluoride varnish in caries reduction on different permanent first molar surfaces. *Journal of Public Health Dentistry* 1997;57(3):184-6.

- 236 9. (Bravo study) Bravo M, Llodra JC, Baca P, Osorio E. Effectiveness of visible light fissure sealant (Delton) versus fluoride varnish
237 (Duraphat): 24-month clinical trial. *Community Dent Oral Epidemiol* 1996;24(1):42-6.
- 238 10. (Bravo study) Bravo M, Montero J, Bravo JJ, Baca P, Llodra JC. Sealant and fluoride varnish in caries: a randomized trial. *J Dent Res*
239 2005;84(12):1138-43.
- 240 **11. Chu CH, Lo EC and Lin HC. Effectiveness of silver diamine fluoride and sodium fluoride varnish in arresting dentin caries in**
241 **Chinese pre-school children. *J Dent Res*. 2002;81(11):767-70.**
- 242 12. (Chr study) Lo EC, Chu CH, Lin HC. A community-based caries control program for pre-school children using topical fluorides: 18-
243 month results. *J Dent Res* 2001;80(12):2071-4.
- 244 13. (Chu study) Wong MC, Lam KF, Lo EC. Bayesian analysis of clustered interval-censored data. *J Dent Res* 2005;84(9):817-21.
- 245 14. (Chu study) Wong MC, Lam KF, Lo EC. Analysis of multilevel grouped survival data with time-varying regression coefficients. *Stat*
246 *Med* 2011;30(3):250-9.
- 247 **15. Clark DC, Stamm JW, Robert G, et al. Results of a 32-month fluoride varnish study in Sherbrooke and Lac Mégantic. *J Am***
248 ***Dent Assoc*. 1985;111(6):949-53.**
- 249 16. (Clark study) Clark DC, Stamm JW, Quee TC, Robert G. Results of the Sherbrooke-Lac Mégantic fluoride varnish study after 20
250 months. *Community Dent Oral Epidemiol* 1985;13(2):61-4.
- 251 **17. Dudovitz RN, Valiente JE, Espinosa G, et al. A school-based public health model to reduce oral health disparities. *J Public***
252 ***Health Dent*. 2019;78(1):9-16.**

18. Effenberger S, Greenwall L, Cebula M, et al. Cost-effectiveness and efficacy of fluoride varnish for caries prevention in South African children: A cluster-randomized controlled community trial. *Community Dent Oral Epidemiol.* 2021;50(5):453-460.
19. Florio FM, Pereira AC, Meneghim Mde C. et al. Evaluation of non-invasive treatment applied to occlusal surfaces. *ASDC J Dent Child.* 2001;68(5-6):326-31.
20. Grodzka K, Augustyniak L, Budny J, et al. Caries increment in primary teeth after application of Duraphat fluoride varnish. *Community Dent Oral Epidemiol.* 1982;10(2):55-9.
21. Hardman MC, Davies GM, Duxbury JT, et al. A cluster randomised controlled trial to evaluate the effectiveness of fluoride varnish as a public health measure to reduce caries in children. *Caries Res.* 2007;41(5):371-6.
22. Hedman E, Gabre P and Birkhed D. Dental hygienists working in schools - a two-year oral health intervention programme in Swedish secondary schools. *Oral Health Prev Dent.* 2015;13(2):177-88.
23. Jiang EM, Lo EC, Chu CH, et al. Prevention of early childhood caries (ECC) through parental toothbrushing training and fluoride varnish application: a 24-month randomized controlled trial. *J Dent.* 2014;42(12):1543-50.
24. Kidd JB, McMahon AD, Sherriff A, et al. Evaluation of a national complex oral health improvement programme: a population data linkage cohort study in Scotland. *BMJ Open.* 2020;10(11):e038116.
25. Liu BY, Lo EC, Chu CH, et al. Randomized trial on fluorides and sealants for fissure caries prevention. *J Dent Res.* 2012;91(8):753-8.
26. McMahon AD, Wright W, Anopa Y, et al. Fluoride varnish in nursery schools: A randomised controlled trial - protecting teeth @3. *Caries Res.* 2020;54(3):274-282.

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307

308 ¹Data used in synthesizing effect taken from studies in bold type.

309 **Appendix Table 3.** Quality assessment of 31 included studies

310

Quality of Execution	RCT (n=25)	Other (n=6)
Good (0–1 limitations)	Randomized at Student Level 14 (Aruda 2012, Autio-Gold 2021, Chu 2002, Clark 1987, Jiang 2014, Liu 2012, McMahon 2020, Modeer 1984, Munoz-Milan 2018, Sirivichayakul 2023, Souza2021, Tagliaferro 2011, Turska-Szybka 2021, Wu 2020) Randomized at School 6 (Braun 2016, Bravo 1997, Effenberger 2021, Hedman 2015, Milsom 2011, Wang 2021)	Retrospective 1 (Kidd 2020)
Fair (2–4 limitations)	Randomized at Student Level 4 (Abru-Placenes 2019, Bergstrom 2014, Florio 2001, Moberg-Skold 2005) Randomized at school level 1 (Hardman 2007)	Controlled Before-After 3 (Grodzka 1982, Pitchka 2013, Zimmer 1999) Retrospective 1 (Bergstrom 2016) Uncontrolled Before-After 1 (Dudowitz 2019)

311

312

313 Abbreviations: RCT, randomized controlled trial.

314

[illegible]

Liu	0	0	0	0	0	0	0	0	0	0
McMahon	0	0	0	0	0	0	0	0	0	0
Milsom	1	0	0	0	0	0	0	0	0	1
Moberg Skold	0	1	0	1	0	1	0	0	0	3
Modeer	0	1	0	0	0	0	0	0	0	1
Munoz-Millan	0	0	0	0	0	1	0	0	0	1
Pitchika	0	1	0	0	0	0	0	1	0	2
Souza	0	1	0	0	0	0	0	0	0	1
Tagliaferro	0	0	0	0	0	0	0	0	0	0
Turska-Szybka	0	0	0	0	1	0	0	0	0	1
Wang Z.; W. Rong; T. Xu	0	0	0	0	0	0	0	0	0	0
Wu	0	0	0	0	0	0	0	0	1	1
Zimmer S., Robke F. J. and Roulet J. F.	1	0	0	1	0	1	0	1		4
Sirivichayakul	0	0	0	0	0	0	0	0	0	0

316

317 Definition: Description=study population and intervention well described; Sampling=sampling frame/universe and inclusion/exclusion
318 criteria well described and representative of eligible population; Outcome=Measurement=valid and reliable; Exposure=valid and reliable;
319 Data analysis=adequate reporting of statistical methods and appropriate statistical testing; Loss to follow-up<80%; Confounding=controlled
320 for confounding if intervention and control groups were different at baseline; Bias=factors present that could have influenced outcomes
321 including examiner blinding; Other=biases or Concerns not represented in other domains

322

323 **Appendix Table 5.** Characteristics of 31 Included studies

Characteristic		Distribution Number of Studies (%)
Setting		
Country	U.S.	3 (9.7%)
	Non-U.S.	28 (90.3%)
Country Income	High	20 (64.5%)
	Upper-Middle	11 (35.5%)
Urbanicity	Urban/Suburban	22 (71.0%)
	Rural	7 (22.6%)
	Urban/Suburban/Rural	2 (6.5%)
School Level	Pre-school	11 (35.5%)
	Elementary (K to 6 th grade)	15 (48.4%)
	Middle/High	5 (16.1%)
Location	School-based	27 (87.1%)
	School-linked	3 (9.7%)
	Both	1 (3.1%)
Population		
Age	Mean	22 reporting (71%) Median: 6.3 years (IQI: 4.0 to 7.2)
	Categorical	<6 years: 11 (35.5%) 6 to 11 years: 15 (48.4%) 12 to 16 years: 5 (16.1%)
Sex	Female	27 reporting (87.1%) 49.8%
	Male	50.2%
Low-income/socially deprived ^a	Yes	18 (58.1%)
	No	3 (9.7%)
	Both	2 (6.5%)
	Not reported	8 (25.8%)
Water fluoridation ^b	Yes	4 (12.9%)
	No	21 (67.7%)
	Not reported	6 (19.4%)

Baseline caries risk ^c	High	22 (71.0%)
	High and low	4 (12.9%)
	Low	4 (12.9%)
	Not reported	1 (3.2%)
Intervention		
Number of fluoride varnish applications per year	1	0 (0%)
	2	22 (71.0%)
	>2	8 (25.8%)
	2 and 4	1 (3.2%)
Provider	Dentist	18 (58.1%)
	Other dental	10 (32.3%)
	Non-dental	2 (6.5%)
	Not reported	1 (3.2%)
Study characteristics		
Study duration ^d	9–18 months	8 (25.8%)
	20–30 months	12 (38.7%)
	32–48 months	11 (35.5%)
Number of participants	<100	2 (6.5%)
	100 to 499	20 (64.5%)
	500 to 999	3 (9.7%)
	≥1000	6 (19.4%)
	Median	253 participants (IQI: 183 to 609)
Dentition used in caries measurement includes chewing surfaces typically eligible for sealants	Primary included	8 (25.8%)
	Primary excluded	2 (6.5%)
	Permanent included	10 (32.3%)
	Permanent excluded	6 (19.4%)
	Primary & permanent included	4 (12.9%)
	Not reported	1 (3.2%)

324
325 IQI: Inter-quartile interval.

326
327 ^a Low-income/Socially deprived: defined as study reported. Social deprivation is an area-based measure of relative deprivation derived from
328 various socio-economic domains.

- 329 ^b Water fluoridation: defined as fluoride content ≥ 0.7 parts per million (ppm) in the drinking water systems of the study area.
- 330 ^c Caries risk: defined as study reported.
- 331 ^d Corresponding intervention duration (months): 4 to 12, 18 to 27, 30 to 45