

Supplemental Material S4. Summary of studies included in the cost of illness analysis.

Author (Year)	Country	Study design	Size (N)	Cohort	Male (%)	Population characteristics (stuttering diagnosis, severity, treatment)	Cost outcomes	Risk of bias
Randomized controlled trials								
de Sonnevile-Koedoot et al. (2015)	The Netherlands	Multi-center parallel group RCT	199	Children	Lidcombe Program: 69.4 RESTART-DCM: 70.0	Stuttering severity rating ≥ 2 ('mild') and stuttered at least 3% of syllables.	Health care utilization, direct and indirect costs.	High
McAllister et al. (2017)	Britain	Two-group parallel design (treatment vs placebo), double-blinded feasibility study.	31	Adults	Treatment: 94 Placebo: 67	Individuals who stutter and have social anxiety disorder.	Health care utilization, direct costs	Low
Non-randomized studies								
Berchiatti et al. (2020)	Italy	Case-control	572 (CWS $n = 62$, CWNS $n = 474$, Teachers $n = 36$)	Children	CWS: 58.1 CWNS: 49.2	Stuttering diagnosis made by speech therapist in medical centers. CWS had prior/current formal therapy.	Education (teacher relationships; academic performance), social (friendships)	High

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Blumgart et al. (2010a)	Australia	Cross-sectional ^a	200	Adults	75.5	Mean (SD) SS = 3.7 (2.8). Mean (SD) perceived stuttering severity = 4.2 (2). 94% had sought prior treatment.	Direct and indirect costs, employment	Moderate
Boulet et al. (2009)	USA	Cross-sectional	95,132 (CWS <i>n</i> = 1,530)	Children	71.4	Parent/ guardian report based on clinical diagnosis	Health care utilization, education (special services/early intervention)	Moderate
Boyle (2018)	USA	Cross-sectional	324	Adults	67	Self-diagnosed PWS. 95% had prior therapy	Social (discrimination), employment (recruitment)	High
Boyle et al. (1994)	USA	Cross-sectional	2,779 (CWS <i>n</i> = 297)	Children with disabilities	Not reported	Parent/ guardian report	Health care utilization, education (school attendance and performance)	High
Calnan & Richardson (1977)	England, Scotland, and Wales	Cross-sectional	11,455 (CWS <i>n</i> = 65)	Children	Not reported	Stuttering 'diagnosed' in three ways: clinician assessment, teacher assessment, speech test. Results based on different diagnosis methods	Education (performance)	High

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Craig & Calver (1991)	Australia	Study II: 10-month follow-up of 2 non-randomized experimental trials	62	Adults	Not reported	Craig 1984: AWS Craig 1985: AWS, mean %SS = 12.9 All participants were successfully treated with smooth speech prior to 10-month follow-up.	Employment (promotion, career improvement)	High
Erickson & Block (2013)	Australia	Cross-sectional	36	Adolescents	77.8	Mean (SD) stuttering frequency 6.9% (5.7%) SS, range = 2.1–26.8% Mean (SD) onset: 8.5 (3.0). Previously received treatment: 30 (84%). Major treatment type: speech restructuring (63% of those treated).	Education (avoid school, affected schoolwork), social (teasing/bullying, exclusion), indirect costs	High
Franic et al. (2012)	USA	Cross-sectional	80 (included $n = 78$, history of stuttering $n = 4$)	Adults	17.9%	Not discussed	Direct and indirect costs (willingness to pay)	High
Gerlach et al. (2018)	USA	Cohort	20,745 (included $n = 13,564$, PWS $n = 261$)	Stuttered in adolescence, outcomes as adults	PWS: 64.8 PWNS: 47.5	PWS: 84% of respondents described their stuttering as "mild"; 15%, as "moderate"; and less than 1%, as "severe."	Employment (earnings, employment status)	Moderate

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Hayhow et al. (2002)	UK	Cross-sectional	332	Adolescents and adults (age range 16–86 years)	71	Self-reported severity (10-point scale, 1=mild and 10=severe). 264 (80%) rating their stammering as "mild" (1–3) on a good day. Bad day 8% (1–3), 15% (4–5), 32% (6–7), 45% (8–10)	Education (performance), employment (occupation choice, promotion), social (friendships, romantic partners)	High
Hugh-Jones & Smith (1999)	UK	Cross-sectional	276	Adolescents or adults	75.7	Not discussed	Education (attendance, performance), employment (performance), social (relationships)	High
Iimura & Miyamoto (2022)	Japan	Cross-sectional	112 (included $n = 110$, AWS without comorbidity $n = 52$)	Adults	82.7	Participates in self-help group: 5% no, 18% rarely, 30% sometimes, 35% often, 12% almost always.	Employment (self-rated job difficulties)	High
Klein & Hood (2004)	USA	Cross-sectional	232	Adults	71.1	Self-rated severity: 33 (14%) very mild, 72 (31%) mild, 103 (44%) moderate, 20 (9%) severe, 4 (<2%) very severe. 91% had been enrolled in speech therapy at one time.	Employment (performance, promotion)	High

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McAllister et al. (2012)	UK	Cohort	18,558 (no stutter at age 16 and no history of speech problems $n = 15,694$, stutter at age 16 $n = 217$)	Stuttered in adolescence, outcomes as adults	PWS: 78.7 to 86.6 ^b PWNS: 47.1 to 67.6 ^b	CWS identified by parent report	Educational (attainment), employment (status and income)	Moderate
McClure & Yaruss (2003)	USA	Cross-sectional	642 (AWS $n = 544$, parents of CWS $n = 98$)	Children, adolescents, and adults	Not reported	Prior treatment: of those who had received treatment, 85% had ≥ 2 experiences. All survey respondents were NSA members, <50% had attended convention, workshop, or meeting	Education (performance), employment (performance, promotion, recruitment)	Critical
O'Brian et al. (2011)	Australia and New Zealand	Cross-sectional	147	Adults	78.9	Stuttering confirmed by SLP. 123 (81.6%) had previously received treatment for stuttering.	Education (achievement)	High
Palasik (2012)	USA	Cross-sectional	184	Adults	72.8	Self-rated stuttering severity: 51% mild, 41% moderate, 8% severe. 21% currently in therapy,	Employment (performance, career development)	High

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						90% have had therapy at any stage		
Plexico et al. (2019)	USA (Geographic locations not equally distributed between PWS and PWNS groups $p = .000$)	Cross-sectional	164 (PWS $n = 72$, PWNS $n = 92$)	Adults	PWS: 63.4 PWNS: 34.1	On a 1-10 (worst) scale, mean (SD) severity: 5.17 (2.37) 86% had some past treatment for stuttering. 40% had received treatment ≥ 4 times. 74% of those receiving prior treatment experienced relapse. 60% were members of NSA.	Employment (roles, career progression, income, discrimination)	High
Rees & Sabia (2014)	USA	Cohort	15,170 (analyzed $n = 13,549$)	Stuttered in adolescence, outcomes as adults	PWS: 57.8 PWNS: 45.5	Self-reported stutter. 7% answered affirmative in Wave III ($n \approx 948$).	Education (achievement, attainment)	Moderate
Rice (1994)	Canada	Cross-sectional	>250	Not reported	Not reported	Not discussed	Employment	Critical
Rice & Kroll (2006)	USA ($n = 239$), Britain ($n = 64$), Canada ($n = 32$), Australia	Cross-sectional	412	Adults	71.6	Stuttering severity: mild (39%), moderate (54%) severe (7%).	Employment	High

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	(<i>n</i> = 24), India (<i>n</i> = 13), other (<i>n</i> = 40). 32 countries total							
Rosenbaum (2018)	USA	Case-control	9,909 enrolled in community college <i>n</i> = 1494, enrolled in 4-year college <i>n</i> = 2,721)	Adults	39.6	Self-reported stutter: 7.2% overall (<i>n</i> = 714), 8.1% not attending college, 7.0% attending community college, 5.5% attending 4-yr college	Education (attainment)	Moderate
Sommer et al. (2021)	Germany	Cross-sectional	27,977	Children, adolescent s, and adults	75	Confirmed outpatient diagnosis (ICD-10 code recorded in insurer database)	Healthcare utilization	High
Werle & Byrd (2022)	USA	Cross-sectional	158	College instructors	Not reported	Instructors who teach or evaluate oral presentations in university foundational oral communications courses within last 5 yrs.	Education (performance)	Moderate
Williams et al. (1969)	USA	Case-control	1. 400 (CWS <i>n</i> =	Children	87	Names of CWS submitted by SLP	Education (performance)	Moderate

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			100, CWNS $n = 300$). 2. 200 (male CWS $n = 50$, male CWNS $n = 150$)					
Qualitative research								
Beilby et al. (2013)	Unclear	Mixed method (questionnaires, interviews).	20	Adults	PWS: 90 Partner: 10	Clinical diagnosis of stuttering confirmed by a SLP with ≥ 10 years of experience in assessment and treatment of fluency disorders;	Social (romantic partner)	Lower
Boberg & Boberg (1990)	Canada	Interviews	15	Adults	0	Non-stuttering wives of PWS. 7/15 husbands completed 3wk intensive stuttering program, 3 completed precision fluency program, 3 avoidance reduction, 2 no therapy	Social (family)	Higher
Bricker-Katz et al. (2013)	Australia	Interviews	9	Adults	66.6	Stuttering severity: 2 severe, 3 moderate, 1 mod/mild, 3 mild. Treatment history: 2 current, 3 intermittent/not	Employment (occupational progression)	Lower

Author (Year)	Country	Study design	Size (N)	Cohort	Male (%)	Population characteristics (stuttering diagnosis, severity, treatment)	Cost outcomes	Risk of bias
						current, 3 never, 1 early childhood		
Butler (2013)	UK	Interviews, focus groups	38	Adults	Just over 80	Typically experiencing dysfluency from age 5yrs	Education (academic achievement, progression)	Lower
Butler (2014)	UK	Interviews, focus groups, conversations	36	Adults	100	Diagnosis/ severity not discussed.	Education (achievement), employment (aspirations, recruitment)	Lower
Crichton-Smith (2002)	UK	Interviews	14	Adults	78.6	13 persistent developmental stuttering, 1 acquired stammer. Previous therapy: 2/14 never, 3/14 as child, 4/14 as adult, 5/14 as child + adult.	Education (attainment), employment	Lower
Georges (2017)	USA (<i>n</i> = 9) NZ (<i>n</i> = 1)	Interviews	10	Adults	0	Not described	Employment, social, direct and indirect costs	Lower
Johnson (1934)	USA	Mixed method (interviews, questionnaires, clinical examination)	80	Children, adolescents, and adults (age range 7–42 years)	76.3	Greater proportion of severe cases among boys than girls.	Education (attainment), employment (occupation choice)	Higher

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		autobiographies).						
Leko Krhen et al. (2021)	Croatia	Interviews	6	Adults	0	Self-report. PWS >5 yrs. Half perceived stuttering moderate at onset, remainder severe. Stutter onset: half <6rs, remainder 6–10 yrs.	Education, employment, social	Higher
Nang et al. (2018)	Australia	Interviews	9	Adults	0	Stuttering severity: 5 mild, 2 mild-moderate, 2 moderate. All started stuttering in childhood and had received some SLP intervention. Support group membership: 3 < 10yrs, 4 10-20 years, 2 > 30 years.	Social (romantic relationships), employment (recruitment)	Lower
Silverman & Zimmer (1982)	US	Interviews	20 (Group 1 <i>n</i> = 10, Group 2 <i>n</i> = 10)	Adults	Group 1: 0 Group 2: 100	Some parent, self, teachers, relative, or friend-diagnosed (no mention of clinical diagnosis). Stutter onset: 4yrs women, 6.2yrs men. Treatment onset: 11.4yrs w, 9.8yr m.	Education, employment, social, healthcare utilization	Higher

AWS = adults who stutter; BSA = British Stuttering Association; CWNS = children who do not stutter; CWS = children who stutter; DCM = Demands and Capacities Model; LP = Lidcombe Program; NSA = National Stuttering Association; NZ = New Zealand; PWNS = people who do not stutter; PWS = people

who stutter; RCT = Randomized Controlled Trial; *SD* = standard deviation; SLP = speech-language pathologist; SS = sample size; UK = United Kingdom; USA = United States of America; yrs. = years.

^a This study is described by the authors as a population group cohort study. However, it specifically recruited PWS so has been classified as a cross-sectional study in this review.

^b Proportion of males was presented by outcome variable (e.g., highest qualification at 50 years, unemployment at 23 years, pay at age 23)