| **Study Description****Author/Year:** Chlebowski et al, 2013[1](#_ENREF_1) | **Baseline/Prescreening Characteristics** | **Screening and Diagnosis** | **Characteristics of Population Screened and/or Diagnosed** | **Screening Outcomes** |
| --- | --- | --- | --- | --- |
| **Country:** US**Study period:** NR**Inclusion/exclusion criteria:*** Excluded if received an ASD diagnosis before being screened with the M-CHAT
* Severe sensory or motor disability (e.g., blindness or deafness)
* child’s caregivers not fluent in English or Spanish
* Includes children from early intervention and pediatric referrals

Note: See related publications Robins 2008,[2](#_ENREF_2) Kleinman 2008,[3](#_ENREF_3) Pandey 2008,[4](#_ENREF_4) Robins 2001[5](#_ENREF_5) | **Population characteristics****Population description:** Screening of 18,989 toddlers at pediatric well-child visits (18-24 month) in 2 US geographic regions **Race/ethnicity, n (%):** White, non-Hispanic: 6184 (68.4)Nonwhite: 1186 (13.1)**Age at screening, mean ± SD:** 20.4 ± 3.1 months**Sex, n (%):** Female: 9388 (49.4)Male: 9601 (50.6)**Risk factors:** NR**IQ, mean ± SD:** NR**ASD severity, mean ± SD:** NR**Mental age:** NR**Language development, mean ± SD:** NR**Adaptive behavior, mean ± SD:** NR**Family context:**SES: NRInsurance status: NRParental education: NR Marital status: NRPrimary language spoken in home: NRLimited English proficiency: NR | **Screening****Instrument/method:** M-CHAT+ telephone followup (M-CHAT/F)**Mode of administration:** Parent-rated, M-CHAT-F by telephone**Setting:** Primary care**Administrator:** Research assistants**Scorer:** Research office**Study definition of positive screen:** Screening positive on 2 of 6 critical items or on 3 of 23 items overall on both the M-CHAT and M-CHAT/F**Total number available to screen:** 18,989**Total number screened:** With M-CHAT: 18,989With M-CHAT/F: 1295M-CHAT:Number screening positive: 1737Number screening negative: 17,252M-CHAT/F: Number screening positive: 272Number screening negative: 1023**% completing screening followup/diagnosis:** 1.1% (207/18,989)**Diagnosis****Diagnostic process:** ADOS, ADI-R, Mullen Scales of Early Learning, Vineland Adaptive Behavior Scales and CARS, DSM-IV; included those who screened positive on M-CHAT/F (n=171) and those flagged by pediatrician despite screen negative (n=36)**Who diagnosed:** Licensed clinical psychologist or developmental pediatrician and a psychology doctoral student**Diagnoses, n:** ASD: Screening Positive: 92 (autistic disorder= 44, PDD-NOS=48)Screening Negative: 1Non-ASD diagnoses, n:Developmental Delay: Screening Positive: 37Screening Negative: 11Developmental language disorder:Screening Positive: 18Screening Negative: 6Other DSM-IV diagnoses:Screening Positive: 5Screening Negative: 1Developmental concerns: Screening Positive: 15Screening Negative: 9Typical development:Screening Positive: 4Screening Negative: 3**Age at diagnosis, mean ± SD:** 25.75 ± 4.51, n=207 | **Screening** **Race/ethnicity, n (%):** NR**Age, mean ± SD:** NR**Sex, n (%):** NR**Risk factors:** NR**IQ, mean ± SD:** NR**ASD severity, mean ± SD:** NR**Language development, mean ± SD:** NR**Adaptive behavior, mean ± SD:** NR**Family context:** NR**Diagnosis****Race/ethnicity, n (%):** NR**Age, mean ± SD:** NR**Sex, n (%):** NR**Risk factors:** NR**IQ, mean ± SD:** NR**ASD severity, mean ± SD:** NR**Language development, mean ± SD:** NR **Family context:** NR | **Performance characteristics (%)****M-CHAT:** PPV: 6%**M-CHAT + M-CHAT/F:**PPV: 54%  **Other outcomes****Intermediate/Process outcomes:** NR**Time between screening and diagnosis, mean ± SD:** NR**Time between screening and intervention, mean ± SD:** NR**Health-related outcomes:**NR**Modifiers of screening outcomes/performance:** NR |

| **Study Description Author/Year:**Kleinman et al, 2008[3](#_ENREF_3) | **Baseline/Prescreening Characteristics** | **Screening and Diagnosis** | **Characteristics of Population Screened and/or Diagnosed** | **Screening Outcomes** |
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| **Country:** US**Study period:** NR**Inclusion/exclusion criteria:*** Excluded if received an ASD diagnosis before being screened with the M-CHAT
* Severe sensory or motor disability

 (eg, blindness or deafness)* child’s caregivers not fluent in English or Spanish
* Includes children from early intervention and pediatric referrals

Note: See related publications Robins 2001,[5](#_ENREF_5) Robins 2008,[2](#_ENREF_2) Chlebowski 2013,[1](#_ENREF_1) Pandey 2008[4](#_ENREF_4) | **Population characteristics****Population description:** Initial screen: Screening of toddlers at pediatric well-child visits or during early intervention intake or after referral from developmental pediatrician or psychologistRescreening: Children who passed initial screening or followup interview; also included participants from Robins et al, 2001**Race/ethnicity, n (%):** NR**Age at screening, mean months ± SD:** 21.01 ± 3.37At followup screening: 58.32 ± 8.66**Sex, n (%):** Initial screening:M: 2003 (52.8)F: 1743 (46.0)NR: 47 (1.2)Rescreening:M: 800 (56.5)F: 602 (42.5)NR: 14 (1)**Risk factors:** NR**IQ, mean ± SD:** NR**ASD severity, mean ± SD:** NR**Mental age:** NR**Language development, mean ± SD:** NR**Adaptive behavior, mean ± SD:** NR**Family context:**SES: NRInsurance status: NRParental education: NR Marital status: NR Primary language spoken in home: NRLimited English proficiency: NR | **Screening****Instrument/method:** M-CHAT+ telephone followup (M-CHAT/F) at 2 time points**Mode of administration:** Parent-rated, M-CHAT-F by telephone**Setting:** Primary care**Administrator:** Research assistants**Scorer:** Research office**Study definition of positive screen:** Screening positive on 2 of 6 critical items or 3 of 23 items overall on both the M-CHAT and M-CHAT/F or physician/parent concerns**Total number available to screen:** Initial screen: 3793Rescreening: 2469**Total number screened:** Initial screen: 3793Rescreening: 1416**Number screening positive:**Initial screen: 385Rescreening: M-CHAT: 201M-CHAT/F: 124**Number screening negative:** Initial screen: 3408Re-screening: M-CHAT: 1215M-CHAT/F: NR**% completing screening followup/diagnosis:** Initial screening: 5.4% (203/3793)Followup screening: n=131 (denominator unclear)**Diagnosis****Diagnostic process:** ADOS, ADI-R, Mullen Scales of Early Learning, Vineland Adaptive Behavior Scales and CARS, DSM-IVRescreening diagnostic pool included those who had received a diagnostic evaluation after initial screening due to screen failure or clinician/parent concern (n=120); failed the rescreener (n=8); or passed the rescreening but indicated they had been referred for possible ASD or other developmental delay in the time between screenings (n=3)**Who diagnosed:** Licensed clinical psychologist or developmental pediatrician and a psychologydoctoral student**Diagnoses, n:** ASD: 60PDD-NOS:18Asperger’s: 2Non-ASD diagnoses, n:Language delay: 13Global developmental delay: 12Other: 14No diagnosis: 12**Age at diagnosis, mean months ± SD:** Non-ASD: 55.87 ± 8.01ASD: 52.17 ± 8.01 | **Screening** **Race/ethnicity, n (%):** NR**Age, mean ± SD:** NR**Sex, n (%):** NR**Risk factors:** NR**IQ, mean ± SD:** NR**ASD severity, mean ± SD:** NR**Language development, mean ± SD:** NR**Adaptive behavior, mean ± SD:** NR**Family context:** SES: NRInsurance status: NRParental education: NRMarital status:NR**Diagnosis****Race/ethnicity, n (%):** NR**Age, mean ± SD:** NR**Sex, n (%):** NR**Risk factors:** NR**IQ, mean ± SD:** NR**ASD severity, mean ± SD:** NR**Language development, mean ± SD:** NR **Family context:** NR | **Performance characteristics (%)**Initial screen: M-CHAT:PPV: 36 (95% CI, 31-40)M-CHAT-F: 74 (95% CI, 68-80)Re-screening:M-CHAT:PPV: 38 (31-45)M-CHAT-F: 59 (50-68)**Other outcomes****Intermediate/Process outcomes:**ASD diagnoses missed at initial screening and discovered at rescreening: 7**Time between screening and diagnosis, mean ± SD:** NR**Time between screening and intervention, mean ± SD:** NR**Health-related outcomes:**NR**Modifiers of screening outcomes/performance:** NR |

| **Study Description Author/Year:**Pandey et al, 2008[4](#_ENREF_4) | **Baseline/Prescreening Characteristics** | **Screening and Diagnosis** | **Characteristics of Population Screened and/or Diagnosed** | **Screening Outcomes** |
| --- | --- | --- | --- | --- |
| **Country:** US**Study period:** NR**Inclusion/exclusion criteria:*** Excluded if received an ASD diagnosis before being screened with the M-CHAT
* Severe sensory or motor disability (e.g., blindness or deafness)
* Child’s caregivers not fluent in English or Spanish
* Includes children from early intervention and pediatric referrals

Note: See related publications Robins 2001,[5](#_ENREF_5) Kleinman 2008,[3](#_ENREF_3) Chlebowski 2013,[1](#_ENREF_1) Robins 2008[2](#_ENREF_2) | **Population characteristics****Population description:** Screening of toddlers at pediatric well-child visits or parent/clinician report of concerns **Race/ethnicity, n (%):** NR**Age at screening, mean months ± SD:** Age 16-23 months: 18.73 ± 1.23Age 24-30 months: 25.12 ± 1.59**Sex, n (%):** Age 16-23 months:M: 2368 (51)F: 2140 (47)NR: 74 (2)Age 24-30 months:M: 1216 (56)F: 949 (43)NR: 19 (1)**Risk factors:** NR**IQ, mean ± SD:** NR**ASD severity, mean ± SD:** NR**Mental age:** NR**Language development, mean ± SD:** NR**Adaptive behavior, mean ± SD:** NR**Family context:** NR | **Screening****Instrument/method:** M-CHAT+ telephone followup (M-CHAT/F) or parent/MD concern**Mode of administration:** Parent-rated, M-CHAT-F by telephone**Setting:** Primary care**Administrator:** Research assistants**Scorer:** Research office**Study definition of positive screen:** Screening positive on 2 of 6 critical items or 3 of 23 items overall on both the M-CHAT and M-CHAT/F or physician/parent concerns**Total number available to screen:** 6776**Total number screened:** 6776**Number screening positive:** 322**Number screening negative:** 6454**Percent completing screening followup/diagnosis:** 4% (270/6776)**Diagnosis****Diagnostic process:** ADOS, ADI-R, Mullen Scales of Early Learning, Vineland Adaptive Behavior Scales and CARS, DSM-IV; included those who screened positive on M-CHAT/F and those flagged by pediatrician despite screen negative **Who diagnosed:** Licensed clinical psychologist or developmental pediatrician and a psychologydoctoral student**Diagnoses, n:** ASD: 93PDD-NOS: 91Non-ASD: 66No diagnosis: 16Typical development: 4**Age at diagnosis, mean ± SD:** NR | **Screening** **Race/ethnicity, n (%):** NR**Age, mean ± SD:** NR**Sex, n (%):** NR**Risk factors:** NR**IQ, mean ± SD:** NR**ASD severity, mean ± SD:** NR**Language development, mean ± SD:** NR**Adaptive behavior, mean ± SD:** NR**Family context:** NR**Diagnosis****Race/ethnicity, n (%):** NR**Age, mean ± SD:** NR**Sex, n (%):** NR**Risk factors:** NR**IQ, mean ± SD:** NR**ASD severity, mean ± SD:** NR**Language development, mean ± SD:** NR **Family context:** NR | **Performance characteristics (%)**High risk=Parental/MD concerns, but no diagnosisLow risk=unselected well- child visit sampleYoung: age 16-23 monthsOld: age 24-30 months**PPV by age group, %:**Total young: 66Total old: 79**PPV, % (95%CI):**Young/high risk: 79 (71-87)Old/high risk:74 (65-83)Among high risk, younger vs. older subjects: p=NSYoung/low risk: 28 (13-43)Old/low risk: 61 (44-78)Among low risk, younger vs. older subjects: p<0.01**Other outcomes** **Intermediate/Process outcomes:** NR**Time between screening and diagnosis, mean ± SD:** NR**Time between screening and intervention, mean ± SD:** NR**Health-related outcomes:** NR**Modifiers of screening outcomes/performance:** NR |

| **Study Description Author/Year:**Robins, 2008[2](#_ENREF_2) | **Baseline/Prescreening Characteristics** | **Screening and Diagnosis** | **Characteristics of Population Screened and/or Diagnosed** | **Screening Outcomes** |
| --- | --- | --- | --- | --- |
| **Country:** US**Study period:** March 2005 – October 2007**Inclusion/exclusion criteria:*** Excluded if received an ASD diagnosis before being screened with the M-CHAT
* Severe sensory or motor disability (e.g., blindness or deafness)
* Child’s caregivers not fluent in English or Spanish
* Includes children from early intervention and pediatric referrals

Note: See related publications Robins 2001,[5](#_ENREF_5) Kleinman 2008,[3](#_ENREF_3) Chlebowski 2013,[1](#_ENREF_1) Pandey 2008[4](#_ENREF_4) | **Population characteristics****Population description:** Initial screen: Screening of toddlers at pediatric well-child visits or during early intervention intake or after referral from developmental pediatrician or psychologistRe-screening: children who passed initial screening or followup interview; also included participants from Robins et al, 2001**Race/ethnicity, n (%):** N=1177Caucasian: 779 (66.2)African American: 246 (20.9)Hispanic/Latino: 32 (2.7)Asian: 24 (2.1)Hawaiian/Pacific Islander: 2 (0.1)Other: 94**Age at screening, mean months ± SD:** 20.92 ± 3.10At followup screening:58.32 ± 8.66**Sex, n (%):** Initial screening:M: 2384 (49.7)F: 2280 (47.5)NR: 133 (2.8)Rescreening:M: 800 (56.5)F: 602 (42.5)NR: 14 (1)**Risk factors:** NR**IQ, mean ± SD:** NR**ASD severity, mean ± SD:** NR**Mental age:** NR**Language development, mean ± SD:** NR**Adaptive behavior, mean ± SD:** NR**Family context:** NR | **Screening****Instrument/method:** M-CHAT+ telephone followup (M-CHAT-F) at 2 time points**Mode of administration:** Parent-rated, M-CHAT-F by telephone**Setting:** Primary care**Administrator:** Research assistants**Scorer:** Research office**Study definition of positive screen:** Screening positive on 2 of 6 critical items or 3 of 23 items overall on both the M-CHAT and M-CHAT-F or clinician suspicion (negative screens included those who declined phone interview or were excluded for other reasons)**Total number available to screen:** 4797**Total number screened:** M-CHAT: 4797M-CHAT-F: 362**Number screening positive:**M-CHAT: 466M-CHAT-F: 65**Number screening negative:** M-CHAT: 4331M-CHAT-F: 301**% completing screening followup/diagnosis:** 1% (41/4797)**Diagnosis****Diagnostic process:** ADOS, ADI-R, Mullen Scales of Early Learning, Vineland Adaptive Behavior Scales and CARS, DSM-IV**Who diagnosed:** Licensed clinical psychologist or developmental pediatrician, psychology doctoral student, an undergraduate research assistant to videotape the child**Diagnoses, n:** ASD: 21Non-ASD: 20**Age at diagnosis, mean months ± SD:** 23.56 ± 4.25 | **Screening** **Race/ethnicity, n (%):** NR**Age, mean ± SD:** NR**Sex, n (%):** NR**Risk factors:** NR**IQ, mean ± SD:** NR**ASD severity, mean ± SD:** NR**Language development, mean ± SD:** NR**Adaptive behavior, mean ± SD:** NR**Family context:** NR**Diagnosis****Race/ethnicity, n (%):** NR**Age, mean ± SD:** NR**Sex, n (%):** NR**Risk factors:** NR**IQ, mean ± SD:** NR**ASD severity, mean ± SD:** NR**Language development, mean ± SD:** NR **Family context:** NR | **Performance characteristics (%)****PPV:**M-CHAT: 5.8%M-CHAT-F: 57%**Other outcomes****Intermediate/Process outcomes:** NR**Time between screening and diagnosis, mean ± SD:** NR**Time between screening and intervention, mean ± SD:** NR**Health-related outcomes:** NR**Modifiers of screening outcomes/performance:** NR |

| **Study Description Author/Year:**Robins et al, 2001[5](#_ENREF_5) | **Baseline/Prescreening Characteristics** | **Screening and Diagnosis** | **Characteristics of Population Screened and/or Diagnosed** | **Screening Outcomes** |
| --- | --- | --- | --- | --- |
| **Country:** US**Study period:** NR**Inclusion/exclusion criteria:*** Excluded if received an ASD diagnosis before being screened with the M-CHAT
* Severe sensory or motor disability (e.g., blindness or deafness)
* child’s caregivers not fluent in English or Spanish
* Includes children from early intervention and pediatric referrals

Note: See related publications Robins 2008,[2](#_ENREF_2) Kleinman 2008,[3](#_ENREF_3) Chlebowski 2013,[1](#_ENREF_1) Pandey 2008[4](#_ENREF_4) | **Population characteristics****Population description:** Initial screen: Screening of toddlers at pediatric well-child visits or during early intervention intake **Race/ethnicity, n (%):** NR**Age at screening, mean months ± SD:** NR **Sex, n (%):** Initial screening:M: 2003 (52.8)F: 1743 (46.0)NR: 47 (1.2)Rescreening:M: 800 (56.5)F: 602 (42.5)NR: 14 (1)**Risk factors:** NR**IQ, mean ± SD:** NR**ASD severity, mean ± SD:** NR**Mental age:** NR**Language development, mean ± SD:** NR**Adaptive behavior, mean ± SD:** NR**Family context:** NR | **Screening****Instrument/method:** M-CHAT+ telephone followup (M-CHAT/F) at 2 time points**Mode of administration:** Parent-rated, M-CHAT-F by telephone**Setting:** Primary care**Administrator:** Research assistants**Scorer:** Research office**Study definition of positive screen:** Screening positive on 2 of 8 critical items or any 3 items overall on both the M-CHAT and M-CHAT/F**Total number available to screen:** 1293**Total number screened:** 1293**Number screening positive:** NR**Number screening negative:** M-CHAT: 1161M-CHAT-F: 74**% completing screening followup/diagnosis:** 4.5% (58/1293)**Diagnosis****Diagnostic process:** ADOS, ADI-R, Mullen Scales of Early Learning, Vineland Adaptive Behavior Scales and CARS, DSM-IV**Who diagnosed:** Licensed clinical psychologist, graduate student clinician, and student who videotaped the session**Diagnoses, n:** ASD or PDD: 39Non-ASD diagnoses, n:Language or global delays: 19**Age at diagnosis, mean months:** ASD: 27.6 Non-ASD: 26.7**Time to evaluation after screening, mean months:** 2.12 | **Screening** **Race/ethnicity, n (%):** NR**Age, mean ± SD:** NR**Sex, n (%):** NR**Risk factors:** NR**IQ, mean ± SD:** NR**ASD severity, mean ± SD:** NR**Language development, mean ± SD:** NR**Adaptive behavior, mean ± SD:** NR**Family context:** NR**Diagnosis****Race/ethnicity, n (%):** NR**Age, mean ± SD:** NR**Sex, n (%):** NR**Risk factors:** NR**IQ, mean ± SD:** NR**ASD severity, mean ± SD:** NR**Language development, mean ± SD:** NR **Family context:** NR | **Performance characteristics (%)****PPV:** 39 of 58 children evaluated due to screen failure were diagnosed with ASD or PDD (67.2%)**Other outcomes****Intermediate/Process outcomes:** ASD diagnoses missed at initial screening and discovered at rescreening: 7**Time between screening and diagnosis, mean ± SD:** NR**Time between screening and intervention, mean ± SD:** NR**Health-related outcomes:** NR**Modifiers of screening outcomes/performance:** NR |

| **Study Description Author/Year:**Nygren et al, 2012[6](#_ENREF_6) | **Baseline/Prescreening Characteristics** | **Screening and Diagnosis** | **Characteristics of Population Screened and/or Diagnosed** | **Screening Outcomes** |
| --- | --- | --- | --- | --- |
| **Country:** Sweden**Study period:** January 2010 – December 2012**Inclusion/exclusion criteria:*** Children seen for 2.5- year-old checkup at child health center, any time during 2010
 | **Population characteristics****Population description:** 3999 Swedish children screened during their 2.5-year well-child visit **Age at screening, mean ± SD:** 2.5 years**Sex, n (%):**Female: 1912 (47.8)Male: 2087 (52.2)**Risk factors:** Family history of ASD: 12/48 (25%)**IQ, mean ± SD:** NR**ASD severity, mean ± SD:** NR**Language development, mean ± SD:** NR**Adaptive behavior, mean ± SD:** NR**Family context:**Primary language spoken in home: NRLimited English proficiency: NR | **Screening****Instrument/method:** M-CHAT+ followup interview, JA-OBS**Mode of administration:** Interview**Setting:** Child health center**Administrator:** Nurse **Scorer:** Nurse**Study definition of positive screen:** Definitive failure on the M-CHAT or failure on ≥2 items of the JA-OBS or both**Total number available to screen:** 3999**Total number screened:** 3999**Number screening positive:**Total: 64M-CHAT+interview: 36JA-OBS: 40Both: 48**Number screening negative:** NR (estimated 3935 based on reported N screening positive)**% completing diagnostic followup, n:** 1.3 (54/3999)**Diagnosis****Diagnostic process:** DSM-IV (based on all evidence obtained at the assessment and medical records), ADOS, Vineland Adaptive Behavior Scales; only screen-positive children followed for diagnosis**Who diagnosed:** Clinicians**Diagnoses, n** M-Chat+interviewASD: 33/36JA-OBSASD: 37/40M-Chat+interview and/or JA-OBSASD: 43/48**Subtypes of ASD among the 48 children diagnosed, n:** Autistic disorder: 27PDD-NOS: 21**Non-ASD diagnoses, n**M-Chat+interview + JA-OBSLanguage Disorder: 3Typically Developing: 3**Age at diagnosis, mean ± SD:** 2.5 ± 0.5 years | **Screening** **Race/ethnicity, n (%):** NR**Age, mean ± SD:** NR**Sex, n (%):** NR**Risk factors:** NR**IQ, mean ± SD:** NR**ASD severity, mean ± SD:** NR**Language development, mean ± SD:** NR**Adaptive behavior, mean ± SD:** NR**Family context:** NR**Diagnosis****Among those diagnosed with ASD** **Race/ethnicity, n:**Parents of non-Swedish descent: 24/48 (50)1 parent not of Swedish descent: 8/48 Both parents of Swedish descent: 16/48**Age, mean ± SD:** NR**Sex, n (%):**Female: NRMale: NR**Risk factors:**Parental concern about child development prior to screening: 35/48Family history of ASD: 12/48**IQ, mean ± SD:** NR**ASD severity, mean ± SD:** NR**Adaptive behavior, mean ± SD:** NR**Family context:**SES: NRInsurance status: NRParental education: NRMarital status: NRPrimary language spoken in home: NRLimited English proficiency: NR | **Performance characteristics, % (95%CI)** **M-CHAT+interview** (n=49):PPV: 91.7 (77.5-98.2)**JA-OBS** (n=48):PPV: 92.5 (79.6-98.4)**M-CHAT and / or JA-OBS** (n=51):PPV: 89.6 (77.3-96.5)**Other outcomes:****Intermediate/Process outcomes:** NR**Time between screening and diagnosis, mean ± SD:** NR**Time between screening and intervention, mean ± SD:** NR**Health-related outcomes:**NR |

| **Study Description Author/year:**Barbaro et al, 2011[7](#_ENREF_7), [8](#_ENREF_8)  | **Baseline/Prescreening Characteristics** | **Screening and Diagnosis** | **Characteristics of Population Screened and/or Diagnosed** | **Screening Outcomes** |
| --- | --- | --- | --- | --- |
| **Country:** Australia**Study period:** September 2006 – 2008**Inclusion/exclusion criteria:*** Children 8 to 24 months of age attending there well visits at a Maternal Child Health center in a 20-km radius of Melbourne University
* “At risk” children referred by Maternal and Child Health nurse to the Social Attention and Communication Study (SACS) team
* Parental consent given
* Attendance at scheduled SACS assessment
 | **Population characteristics****Population description:** From a population of 20,770 children monitored via the Social Attention and Communication Study (SACS) at maternal and child health centers, 216 children referred for further evaluation; consent obtained for 124 children; 110 children completed at least 1 SACS assessmentIncluded 10 12-month assessments; 46 18-month assessments; and 100 24-month assessments**Race/ethnicity, n (%):** NR**Age at screening, mean ± SD:** NR**Sex, n (%):** NR**Risk factors:** NR**IQ, mean ± SD:** NR**Language development, mean ± SD:** NR**Adaptive behavior, mean ± SD:** NR**Family context:** NR | **Screening****Instrument/method:** SACS protocol**Mode of administration:** In person**Setting:** Maternal-child health centers**Administrator:** Nurses**Scorer:** Nurses**Study definition of positive screen:** Items most relevant to ASD and developmentally appropriate for the age being monitored were considered “key” items. Children were considered at risk for an ASD only if they showed a “pattern” of failure on the items of interest (e.g., by failing 3 of the 4 key items).**Total number available to screen:** 22,168**Total number screened:** 20,770**Number screening positive:** 216**Number screening negative:** 20,554**% completing screening followup/diagnosis, (n):** Screen positive:0.5 (110)**Diagnosis****Diagnostic process:**At 12 and 18 months: Investigator administered: Mullen Scales of Early Learning, Early Social and Communication Scales; imitation/name call/spontaneous play tasks (+empathy at 18 months only); CHAT-23 (at 18 months only)Parent questionnaires: Infant Toddler Checklist-CSBS-DP; Early Development Interview; CHAT-23 (18 months only)At 24 months: Investigator administered: Mullen Scales of Early Learning; ADOS; imitation/empathy tasksParent questionnaires: ADI-R**Who diagnosed:** SACS investigators**Diagnoses, n** ASD: 50Autistic disorder: 39Developmental or other language delay: 20Typically developing:1**Age at diagnosis, mean ± SD:** NR | **Screening** **Race/ethnicity, n (%):** NR**Age, mean ± SD:** NR**Sex, n (%):** NR**Risk factors:** NR**IQ, mean ± SD:** NR**Language development, mean ± SD:** NR**Adaptive behavior, mean ± SD:** NR**Family context:** NR**Diagnosis****Race/ethnicity, n (%):** NR**Age, mean months ± SD:**12 month assessment:Autistic disorder: 13.7 ± 1.2ASD: 12.7 ± 0.5Developmental/language delay: 15.018 month assessment:Autistic disorder: 19.2 ± 1.0ASD: 19.1 ± 1.2Developmental/language delay: 19.9 ± 1.624 month assessment:Autistic disorder: 25.2 ± 1.6ASD: 25.6 ± 2.2Developmental/language delay: 25.8 ± 2.7**Sex, n (%):** 12 month assessment:Female:Autistic disorder: 1ASD: 1Developmental/language delay: 0Male:Autistic disorder: 2ASD: 5Developmental/language delay: 118 month assessment:Female:Autistic disorder: 4ASD: 1Developmental/language delay: 3Male:Autistic disorder: 12ASD: 20Developmental/language delay: 524 month assessment:Female:Autistic Disorder: 10ASD: 8Developmental/language delay: 6Male:Autistic disorder: 27ASD: 34Developmental/language delay: 8**Risk factors:** NR**IQ, mean ± SD:** NR**Overall mental age, months:**12 months:Autistic disorder: 10.6 ± 2.6ASD: 10.3 ± 2.2Developmental/language delay: 12.318 months:Autistic disorder: 13.2 ± 1.9ASD: 14.8 ± 1.8Developmental/language delay: 15.4 ± 1.524 months:Autistic disorder: 15.1 ± 2.5ASD: 18.5 ± 2.9Developmental/language delay: 19.5 ± 3.3**Nonverbal age, months:**12 months:Autistic disorder: 12.0 ± 4.3ASD: 11.5 ± 2.2Developmental/language delay: 16.518 months:Autistic disorder: 17.3 ± 2.3ASD: 17.5 ± 2.9Developmental/language delay: 17.4 ± 1.924 months:Autistic disorder: 19.1 ± 2.9ASD: 21.4 ± 2.7Developmental/language delay: 21.3 ± 3.6**T score, visual reception**12 months:Autistic disorder: 29.7 ± 6.5ASD: 37.0 ± 9.2Developmental/language delay: 47.018 months:Autistic disorder: 37.6 ± 8.5ASD: 39.0 ± 9.1Developmental/language delay: 37.0 ± 7.524 months:Autistic disorder: 30.9 ± 7.6ASD: 35.8 ± 8.1Developmental/language delay: 36.6 ± 9.9**T score, fine motor:**12 months:Autistic Disorder: 43.7 ± 20.1ASD: 44.7 ± 10.8Developmental/language delay: 53.018 monthsAutistic disorder: 44.0 ± 10.9ASD: 44.9 ± 11.8Developmental/language delay: 42.1 ± 6.524 monthsAutistic disorder: 36.0 ± 11.1ASD: 40.7 ± 9.0Developmental/language delay: 37.8 ± 11.0**ASD severity, mean ± SD:** NR**Language development, mean ± SD:**Verbal age:12 months:Autistic disorder: 9.2 ± 2.9ASD: 9.0 ± 2.5Developmental/language delay: 8.018 monthsAutistic disorder: 9.2 ± 2.2ASD: 12.0 ± 1.5Developmental/language delay: 13.4 ± 2.024 months:Autistic disorder: 11.0 ± 2.7ASD: 15.8 ± 4.1Developmental/language delay: 17.6 ± 3.5T score, receptive language:12 months:Autistic disorder: 28.5 ± 5.2ASD: 30.8 ± 7.3Developmental/language delay: 20.018 monthsAutistic disorder: 20.6 ± 2.5ASD: 24.4 ± 5.0Developmental/language delay: 25.5 ± 4.524 months Autistic disorder: 20.3 ± 1.6ASD: 26.3 ± 9.2Developmental/language delay: 32.2 ± 10.4T score, expressive language:12 months:Autistic disorder: 31.3 ± 3.8ASD: 38.2 ± 10.6Developmental/language delay: 28.018 months:Autistic disorder: 26.3 ± 4.6ASD: 31.4 ± 4.9Developmental/language delay: 35.0 ± 4.324 months:Autistic disorder: 23.9 ± 4.1ASD: 31.7 ± 7.4Developmental/language delay: 32.5 ± 6.5**Adaptive behavior, mean ± SD:** NR**Family context:** NR | **Performance characteristics****SACS assessment process:****PPV (%):** At 12 months: 90At 18 months: 79At 24 months: 81**Other outcomes****Intermediate/Process outcomes:****Time between screening and diagnosis, mean ± SD:** NR**Time between screening and intervention, mean ± SD:** NR**Health-related outcomes:** NR**Modifiers of screening outcomes/performance:** NR |

| **Study Description Author/Year:**Canal-Bedia et al, 2011a[9](#_ENREF_9" \o "Canal-Bedia, 2011 #298) | **Baseline/Prescreening Characteristics** | **Screening and Diagnosis** | **Characteristics of Population Screened and/or Diagnosed** |
| --- | --- | --- | --- |
| **Country:** Spain**Study period:** October 2005 – April 2008**Inclusion criteria:*** Age 18-36 months
* Resident in geographic area of interest during study period
 | **Population characteristics****Population description:** Unselected children at well-child visit **Race/ethnicity, n (%):** NR**Age at screening, range:**Unselected population: 18-24 months**Sex, n (%):**Female: 949 (46)Male: 1106 (54)**Risk factors:** None**IQ, mean ± SD:** NR**Language development, mean ± SD:** NR**Adaptive behavior, mean ± SD:** NR**Family context:** NR | **Screening****Instrument/method:** M-CHAT with followup interview (Spanish translation)**Mode of administration:** In person during well-child visit, telephone followup for those screening positive**Setting:** Clinic**Administrator:** Initial screening:Primary care pediatricians and nursesPhone followup: Psychologist with child development training**Scorer:** Initial screening:Central research team Phone followup: Psychologist conducting the phone interview**Study definition of positive screen:** Failure of 3/23 items or 2/6 critical items **Total number available to screen:** NR**Total number screened:** 2055**Number screening positive:**Initial screening: 336Phone followup: 31**Number screening negative:**Initial screening: 1719Phone interview: 305**% completing screening telephone followup:** Screen positive:100Screen negative: 100**% completing diagnosis:** Screen positive:100**Diagnosis****Diagnostic process:** Team of clinicians using diagnostic algorithm based on recommendations of American Academy of Neurology and Child Neurology Society plus VABS, Merrill-Palmer revised scales, ADOS-G module 1 with cases classified according to DSM-IV-TR**Who diagnosed:** Psychologists and neurologists **Diagnoses, n:**ASD: 6Non-ASD: 25**Age at diagnosis, range:** 18-24 months | **Screening** **Race/ethnicity, n (%):** NR**Age, mean ± SD:** NR**Sex, n (%):** NR**Risk factors:** NR**IQ, mean ± SD:** NR**Language development, mean ± SD:** NR**Adaptive behavior, mean ± SD:** NR**Family context:** NR**Diagnosis****Race/ethnicity, n (%):** NR**Age, mean ± SD:** NR**Sex, n (%):** NR**Risk factors:** NR**IQ, mean ± SD:** NR**ASD severity, mean ± SD:** NR**Language development, mean ± SD:** NR**Adaptive behavior, mean ± SD:** NR**Family context:** NR |

| **Study Description Author/Year:**Canal-Bedia et al, 2011b[9](#_ENREF_9" \o "Canal-Bedia, 2011 #298) | **Baseline/Prescreening Characteristics** | **Screening and Diagnosis** | **Characteristics of Population Screened and/or Diagnosed** | **Screening Outcomes** |
| --- | --- | --- | --- | --- |
| **Country:** Spain**Study period:** October 2005 – April 2008**Inclusion criteria:*** Age 18-36 months or for children at high risk, maximum chronological age of 48 months with developmental age of 18-24 months
* Resident in geographic area of interest during study period
 | **Population characteristics****Population description:** Unselected children at well-child visit and children considered at high risk for ASD recruited from early intervention or child psychiatry units**Race/ethnicity, n (%):** NR**Age at screening, range:**Unselected population: 18-24 monthsHigh-risk population: NR**Sex, n (%):**Unselected populationFemale: 1163 (47)Male: 1254 (51)High-risk populationFemale: 14 (.56)Male: 49 (2)**Risk factors:**Attending early intervention or child psychiatry units, n=63**IQ, mean ± SD:** NR**Language development, mean ± SD:** NR**Adaptive behavior, mean ± SD:** NR**Family context:** NR**Primary language spoken in home:** NR**Limited English proficiency:** NR | **Screening****Instrument/method:** M-CHAT (with followup interview) (Spanish translation)**Mode of administration:** In person during well-child visit, telephone followup for those screening positive**Setting:** Clinic**Administrator:** Initial screening:Primary care pediatricians and nursesPhone followup: Psychologist with child development training**Scorer:** Initial screening:Central research team Phone followup: Psychologist conducting the phone interview**Study definition of positive screen:** Failure of 3/23 items or 2/6 critical items **Total number available to screen:** NR**Total number screened:** 2480**Number screening positive:**Initial screening: 429Phone followup: 86**Number screening negative:**Initial screening: 2051Phone interview: 343**% completing screening telephone followup:** Screen positive:100Screen negative: 100**% completing diagnostic followup:** Screen Positive: 100**Diagnosis****Diagnostic process:** Team of clinicians using diagnostic algorithm based on recommendations of American Academy of Neurology and Child Neurology Society plus VABS, Merrill-Palmer revised scales, ADOS-G module 1 with cases classified according to DSM-IV-TR**Who diagnosed:** Psychologists and neurologists **Diagnoses, n ASD:**Unselected population: 4High-risk population: 19**Non-ASD diagnoses, n:** Typical development: 4 Non-ASD developmental disorder: 59 **Age at diagnosis, range:** Unselected population: 18-24 monthsHigh-risk population: NR | **Screening** **Race/ethnicity, n (%):** NR**Age, mean ± SD:** NR**Sex, n (%):** NR**Risk factors:** NR**IQ, mean ± SD:** NR**Language development, mean ± SD:** NR**Adaptive behavior, mean ± SD:** NR**Family context**SES: NRInsurance status: NRParental education : NRMarital status: NR**Diagnosis****Race/ethnicity, n (%):** NR**Age, mean ± SD:** NR**Sex, n (%):** NR**Risk factors:** NR**IQ, mean ± SD:** NR**ASD severity, mean ± SD:** NR**Language development, mean ± SD:** NR**Adaptive behavior, mean ± SD:** NR**Family context:** NR | **Performance characteristics****Initial screen + phone followup, % (95% CI)**PPV: 35 (23-46)AUC: 99**Other outcomes****Intermediate/Process outcomes:** NR**Time between screening and diagnosis, mean ± SD:** NR**Time between screening and intervention, mean ± SD:** NR**Health-related outcomes:**NR**Modifiers of screening outcomes/performance:** NR |

| **Study Description Author/Year:**Inada et al, 2011 [10](#_ENREF_10) | **Baseline/Prescreening Characteristics** | **Screening and Diagnosis** | **Characteristics of Population Screened and/or Diagnosed** | **Screening Outcomes** |
| --- | --- | --- | --- | --- |
| **Country:** Japan**Study period:**Reliability: NRConcurrent validity:December 2008 – December 2009Discriminant validity: April 2005 – March 2007**Inclusion/exclusion criteria:*** Validity samples: Discriminant: 18- month-olds attending health checkup in Munakata City, Japan between April 2005 and March 2007
 | **Population characteristics****Population description:***Discriminant Validity Sample*Collected from children at free health checkup visits for 18-month-olds**Race/ethnicity, n (%):** NR**Age at screening, mean ± SD:***Discriminant Validity Sample: NR* (but collected at 18-month well-baby visit)**Sex, n (%):***Discriminant Validity Sample*Female: 575 (48.4)Male: 612 (51.6)**Risk factors:** NR**IQ, mean ± SD:** NR**Language development, mean ± SD:** NR**Adaptive behavior, mean ± SD:** NR**Family context:**Primary language spoken in home: NR Limited English proficiency:NA | **Screening****Instrument/method:** JapaneseM-CHAT 23-item version, M-CHAT 9-item version (short)**Mode of administration:** Parent-rated**Setting:** Clinic**Administrator:** NR**Scorer:** Research team**Study definition of positive screen:** 23-item M-CHAT: Failing 2/23 items9-item M-CHAT: Failing 1/9 items**Total number available to screen:** Discriminant Validity: 1187 **Total number screened:** Discriminant Validity: 1187 **Number screening positive** **Cutoff value ≥2:**23 items: 1489 items: 60**Number screening negative** **Cutoff value ≥2:**23 items: 10399 items: 1127**% completing screening followup/ diagnosis:**Screen positive+screen negative:100**Diagnosis****Diagnostic process:*****Discriminant Validity Sample***Children were diagnosed based on developmental history, clinical assessment, and based on DSM-IV-TR criteria**Who diagnosed:** Research team including 2 psychiatrists and psychologist**Diagnoses, n** ***Discriminant Validity Sample*****Among those screening positive:** (cutoff value ≥2)Using 23 items:ASD: 15Non-ASD: 133Using 9 items:ASD: 11Non-ASD: 49**Among those screening negative:** (cutoff value ≥2)Using 23 items:ASD: 5Non-ASD: 1034Using 9 items:ASD: 9Non-ASD: 1118**Age at diagnosis, mean ± SD:** 24 months ± 0.7 months | **Screening** **Race/ethnicity, n (%):** NR**Age, mean ± SD:** NR**Sex, n (%):** NR**Risk factors:** NR**IQ, mean ± SD:** NR**Language development, mean ± SD:** NR**Adaptive behavior, mean ± SD:** NR**Family context:** NR**Diagnosis****Race/ethnicity, n (%):** NR**Age, mean ± SD:** 24 months ± 0.7 months**Sex, n (%):**FemaleASD: 4Non-ASD: 571MaleASD: 16Non-ASD: 596**Risk factors:** NR**IQ, mean ± SD:** NR**ASD severity, mean ± SD:**  NR**Language development, mean ± SD:** NR**Adaptive behavior, mean ± SD:** NR**Family context:** NR | **Performance characteristics*****23-item M-CHAT******Cutoff Score ≥1***Sensitivity: 80Specificity: 60.9PPV: 3.4NPV: 99.4***Cutoff Score ≥2***Sensitivity: 75Specificity: 89.3PPV: 10.7NPV:99.5***Cutoff Score ≥3***Sensitivity: 55Specificity: 96.1PPV: 19.3NPV:99.2***Cutoff Score ≥4***Sensitivity: 35Specificity: 97.8PPV: 21.2NPV:98.9***9-item M-CHAT******Cutoff Score ≥1***Sensitivity: 65Specificity: 88.5PPV: 8.8NPV:99.3***Cutoff Score ≥2***Sensitivity: 55Specificity: 95.8PPV: 18.3NPV: 99.2***Cutoff Score ≥3***Sensitivity: 40Specificity: 98.1PPV: 26.7NPV:99.0***Cutoff Score ≥4***Sensitivity: 20Specificity: 99.0PPV: 25.0NPV:98.6**Other outcomes****Intermediate/Process outcomes****Time between screening and diagnosis, mean ± SD:** NR**Time between screening and intervention, mean ± SD:** NR**Health-related outcomes:** NR**Modifiers of screening outcomes/performance:** NR |

| **Study Description Author/Year:**Miller et al, 2011[11](#_ENREF_11) | **Baseline/Prescreening Characteristics** | **Screening and Diagnosis** | **Characteristics of Population Screened and/or Diagnosed** | **Screening Outcomes** |
| --- | --- | --- | --- | --- |
| **Country:** US**Study period:** NR**Inclusion/exclusion criteria:** * Toddlers aged 14-30 months presenting to the community based pediatric practice during the 6 month screening period
 | **Population characteristics****Population description:** Children attending any visit during the study period (well-child, sick, followup or injection visit). **Race/ethnicity, n (%):**N=524Black: 17 (3.2)Pacific Islander: 21 (4.0)Asian: 22 (4.2)Native American: 11 (2.0)White, Non- Hispanic: 287 (55)Other: 1 (0.2)Hispanic: 167 (32)**Age at screening, mean ± SD:**Range:14-24 months**Sex, n (%):** NR**Risk factors:** NR**IQ, mean ± SD:** NR**Language development, mean ± SD:** NR**Adaptive behavior, mean ± SD:** NR**Family context:** NR**Primary language spoken in home, n (%):**English: 721 (91)Spanish: 75 (9)**Limited English proficiency:** NR | **Screening****Instrument/method:** M-CHAT + followup interview or Infant Toddler Checklist (ITC) + followup interview**Mode of administration:** Parent-rated**Setting:** Primary Care**Administrator:** Self-administered by caregiver; followup phone call be research staff**Scorer:** Research Staff**Study definition of positive screen:** ITC: Score below 10th percentile on Social, Symbolic, or Total ScoreM-CHAT: Failure of ≥2 critical items or ≥3 of any item**Total number available to screen:** 990**Total number screened:** 796**Number screening positive:**At initial questionnaire: 192 At followup phone call: 47 **Number screening negative:**At initial questionnaire: 544At follow-p phone call: 98 **% completing screening followup/ diagnosis:**Overall: 30/796 (4%)Screening positive: 28/192 (14.6%)Screening negative: 2/544 (0.4%)**Diagnosis****Diagnostic process:** Parents of children who screened positive on either screener or were referred by a clinician due to concerns (regardless of screen outcome) were called. If positive M-CHAT, M-CHAT followup interview was completed by a graduate student. If positive ITC, unspecified relevant items were repeated and discussed over the phone. If clinician referral, M-CHAT and ITC were repeated over the phone. Children who had a confirmed positive screen over the phone were invited for diagnostic evaluation, including ADOS-T, Mullen, and Vineland.**Who diagnosed:** Research reliable clinician**Diagnoses, n** Among screen positives (n=25):ASD: 8 Non-ASD diagnoses, n:Developmental delay: 16Typically developing: 1Among screen negatives (n=2):ASD: 2Non-ASD:0**Age at diagnosis:** NR | **Screening** **Race/ethnicity, n (%):** NR**Age, mean ± SD:** NR**Sex, n (%):** NR**Risk factors:** NR**IQ, mean ± SD:** NR**Language development, mean ± SD:** NR**Adaptive behavior, mean ± SD:** NR**Family context:** NR**Diagnosis****Race/ethnicity, n (%):ASD**Black: 1 (8)Hispanic: 4 (30.7)White, non-Hispanic: 8 (61.5)**Non-ASD**Black: 0 (0)Hispanic: 4 (23.5)White, non-Hispanic: 11 (64.7)Pacific Islander: 2 (11.8)**Age, mean ± SD:** NR**Sex, n (%):** NR**Risk factors:** NR**IQ, mean ± SD:** NR**ASD severity, mean ± SD:** NR**Language development, mean ± SD:** NR**Adaptive behavior, mean ± SD:** NR**Family context:** NR | **Performance characteristics (%)**M-CHAT/ITC:Sensitivity: NRPPV: 32 (8/25) **Other outcomes:****Intermediate/Process outcomes****Time between screening and diagnosis, mean ± SD:** NR**Time between screening and intervention, mean ± SD:** NR**Health-related outcomes:** NR**Modifiers of screening outcomes/performance:** NR |

| **Study Description Author/Year:**Pierce et al, 2011[12](#_ENREF_12) | **Baseline/Prescreening Characteristics** | **Screening and Diagnosis** | **Characteristics of Population Screened and/or Diagnosed** | **Screening Outcomes** |
| --- | --- | --- | --- | --- |
| **Country:** US**Study period:** NR**Inclusion/exclusion criteria:*** Infants attending 1-year checkup at various pediatrician offices in San Diego County, California
 | **Population characteristics****Population description:** Children at well-child checkup visits; 184 children who screened positive at 12-month well-baby visits; 41 control children**Race/ethnicity, n (%):** NR**Age at screening, mean ± SD:**Mean=12.54 monthsRange=10.08 to 15.97 months**Sex, n (%):** NR**Risk factors:** NR.**IQ, mean ± SD:** NR**Language development, mean ± SD:** NR**Adaptive behavior, mean ± SD:** NR**Family context:** NR**Primary language spoken in home:** NR | **Screening****Instrument/method:** CSBS-DP-IT**Mode of administration:** Parent-rated**Setting:** Primary care**Administrator:** Checklist is given to parents by receptionist at primary care office; parent self-administers**Scorer:** Medical staff**Total number available to screen:** 10,479**Total number screened:** 10,479**Number completing screening followup/diagnosis:** Screen positive: 184 Screen negative: 41**Number screening positive:** 1318 (12.5%)**Number screening negative:** 9179 (87.5%)**Diagnosis****Diagnostic process:** Developmental evaluation including ADOS-T and Mullen. Children were followed every 6 months until 3 years of age. **Who diagnosed:** Psychologist **Diagnoses, n** ASD: 32Initial ASD diagnosis, removed at followup: 5Language Delay: 56Developmental Delay: 9Other Diagnosis: 36False Positive: 46Typically Developing: 41**Age at diagnosis (latest), mean ± SD months:**ASD: 34.7 ± 8.8Initial ASD, removed at followup: 32.0 ± 8.9Language Delay: 25.9 ± 9.2Developmental Delay: 33.4 ± 9.8Other: 25.7 ± 8.6False-Positive Screen: 25.4 ± 8.7Typically Developing: 25.5 ± 10.3**Number of Visits, mean ± SD**ASD: 6.0 ± 2.5Initial ASD, removed at follow-up: 4.8 ± 2.2Language Delay: 4.4 ± 2.4Developmental Delay: 5.8 ± 2.9Other: 4.3 ± 2.1False-Positive Screen: 4.6 ± 2.3Typically Developing: 4.3 ± 2.7**% of sample tracked until 24 months old or older:**ASD: 97%Initial ASD, removed at followup: 80%Language Delay: 54%Developmental Delay: 78%Other: 61%False-Positive Screen: 61%Typically Developing: 56%**% of sample tracked until 32 months old or older:**ASD: 72%Initial ASD, removed at followup: 60%Language Delay: 30%Developmental Delay: 67%Other: 26%False-Positive Screen: 28%Typically Developing: 42% | **Screening** **Race/ethnicity, n (%):** NR**Age, mean ± SD:** NR**Sex, n (%):** NR: **Risk factors:** NR**IQ, mean ± SD:**Screen positive: NRScreen negative: 111.2 ± 11.7**Language development, mean ± SD:** NR**Adaptive behavior, mean ± SD:** NR**Family context:** NR**Diagnosis***At Earliest Age***Race/ethnicity, n (%):** NR**Sex, n (%):** NR**Risk factors:** NR**Age at IQ Testing, mean ± SD:**ASD: 17.8 ± 3.9Language Delay: 15.3 ± 3.1Developmental Delay: 17.0 ± 3.9Other: 14.5 ± 2.5Initial ASD, removed at followup: 15.9 ± 4.4False-Positive Screen: 13.7 ± 1.4Typically Developing: 14.5 ± 2.4**IQ (Early Learning Composite), mean ± SD:**MSEL; Standard ScoreASD: 75.5 ± 15.4Language Delay: 90.4 ± 11.6Developmental Delay: 63.3 ± 11.1Other: 96.3 ± 12.0Initial ASD, removed at followup: 92.6 ± 9.1False-Positive Screen: 106.1 ± 11.9Typically Developing: 111.2 ± 11.7**IQ (Visual Reception), mean ± SD:**MSEL; T-ScoresASD: 43.0 ± 10.2Language Delay: 51.0 ± 10.2Developmental Delay: 30.5 ± 7.3Other: 52.8 ± 9.5Initial ASD, removed at followup: 51.6 ± 7.2False-Positive Screen: 55.0 ± 8.5Typically Developing:56.5 ± 8.2**Language development (Receptive Language), mean ± SD:**MSEL; T-ScoreASD: 29.1 ± 11.4Language Delay: 39.6 ± 8.9Developmental Delay: 23.4 ± 3.1Other:40.7 ± 8.4Initial ASD, removed at followup: 34.8 ± 5.5False-Positive Screen: 46.7 ± 8.3Typically Developing: 53.4 ± 11.0**Language development (Expressive Language), mean ± SD:**MSEL; T-ScoreASD: 32.2 ± 11.7Language Delay: 37.0 ± 7.3Developmental Delay: 26.7 ± 8.0Other: 45.3 ± 8.0Initial ASD, removed at followup: 41.6 ± 8.1False-Positive Screen: 51.6 ± 9.6Typically Developing:53.3 ± 7.4**Age at Earliest ADOS, mean ± SD:**ASD: 17.9 ± 3.8Language Delay: 15.6 ± 3.1Developmental Delay: 16.2 ± 3.1Other: 14.7 ± 2.5Initial ASD, removed at followup: 16.2 ± 4.8False-Positive Screen: 14.0 ± 1.5Typically Developing:15.0 ± 2.3**ASD severity, mean ± SD:**ADOS Total ScoreASD: 16.8 ± 6.0Language Delay: 6.5 ± 4.3Developmental Delay: 12 ± 7.2Other: 6.2 ± 4.1Initial ASD, removed at followup: 11.6 ± 5.0False-Positive Screen: 3.3 ± 3.0Typically Developing: 2.5 ± 2.1**ASD severity, mean ± SD:**ADOS Social Affect ScoreASD: 13.8 ± 4.8Language Delay: 5.3 ± 3.3Developmental Delay: 9.6 ± 6.4Other: 4.3 ± 3.2Initial ASD, removed at followup: 9.8 ± 4.1False-Positive Screen: 3.0 ± 2.9Typical: 2.1 ± 1.8**ASD severity, mean ± SD:**ADOS RR ScoreASD: 2.9 ± 1.8Language Delay: 1.2 ± 1.4Developmental Delay: 2.3 ± 2Other: 1.8 ± 2.1Initial ASD, removed at followup: 1.8 ± 1.6False-Positive Screen: 0.3 ± 0.6Typically Developing:0.5 ± 1.0**Adaptive behavior, mean ± SD:** NR**Family context:** NR*At Latest Age***Race/ethnicity, n (%):** NR**Sex, n (%):** NR**Risk factors:** NR**Age at Latest IQ Testing, mean months ± SD:**ASD: 34.1 ± 8.9Language Delay: 25.1 ± 9.0Developmental Delay: 32.4 ± 11.2Other: 24.9 ± 8.8Initial ASD, removed at followup: 31.7 ± 9.3False-Positive Screen: 24.6 ± 8.9Typically Developing: 23.8 ± 10.2**IQ (Early Learning Composite), mean ± SD:**MSEL; Standard ScoreASD: 78.6 ± 17.5Language Delay: 98.8 ± 17.4Developmental Delay: 58.8 ± 22.1Other: 98.6 ± 18.1Initial ASD, removed at followup: 99.8 ± 8.1False-Positive Screen: 110.9 ± 13.3Typically Developing: 111.8 ± 13.6**IQ (Visual Reception), mean ± SD:**MSEL; T-ScoresASD: 41.0 ± 11.6Language Delay: 54.7 ± 12.6Developmental Delay: 31.8 ± 12.2Other: 51.8 ± 12.3Initial ASD, removed at followup: 50.6 ± 3.9False-Positive Screen: 57.3 ± 8.7Typically Developing: 56.9 ± 11.1**Language development (Receptive Language), mean ± SD:**MSEL; T-ScoreASD: 35.5 ± 12.1Language Delay: 45.7 ± 11.3Developmental Delay: 30.4 ± 9.4Other: 46.1 ± 11.1Initial ASD, removed at followup: 46.8 ± 10.7False-Positive Screen: 51.8 ± 9.2Typically Developing: 54.3 ± 11.7**Language development (Expressive Language), mean ± SD:**MSEL; T-ScoreASD: 37.6 ± 14.6Language Delay: 43.2 ± 11.2Developmental Delay: 30.9 ± 8.3Other: 47.6 ± 10.0Initial ASD, removed at followup: 54.0 ± 6.2False-Positive Screen: 51.8 ± 10.4Typically Developing: 53.1 ± 8.3**Age at Latest ADOS, mean ± SD:**ASD: 34.2 ± 8.8Language Delay: 25.1 ± 8.8Developmental Delay: 32.6 ± 11.2Other: 24.7 ± 9.1Initial ASD, removed at followup: 32.1 ± 10.3False-Positive Screen: 24.9 ± 8.7Typically Developing:24.6 ± 9.9**ASD severity, mean ± SD:**ADOS Total ScoreASD: 16.9 ± 5.2Language Delay: 4.1 ± 3.5Developmental Delay: 6.9 ± 4.8Other: 4.8 ± 3.0Initial ASD, removed at followup: 5.3 ± 1.0False-Positive Screen: 2.6 ± 2.5Typically Developing: 1.9 ± 2.1**ASD severity, mean ± SD:**ADOS Social Affect ScoreASD: 13.4 ± 4.6Language Delay: 3.6 ± 2.9Developmental Delay: 4.6 ± 3.4Other: 4.0 ± 2.4Initial ASD, removed at followup: 4.8 ± 1.9False-Positive Screen: 2.3 ± 2.3Typically Developing: 1.7 ± 1.8**ASD severity, mean ± SD:**ADOS RR ScoreASD: 3.5 ± 1.6Language Delay: 0.6 ± 1.0Developmental Delay: 2.3 ± 1.8Other: 0.8 ± 1.6Initial ASD, removed at followup: 0.5 ± 1.0False-Positive Screen: 0.3 ± 0.7Typically Developing:0.2 ± 0.5**Adaptive behavior, mean ± SD:** NR**Family context:** NR | **Performance characteristics (%)**Sensitivity: 100Specificity: 47PPV: 75NPV: 100**Other outcomes****Intermediate/Process outcomes****Time between screening and diagnosis, mean ± SD:** NR**Time between screening and intervention, mean ± SD:** Children began treatment on average at 17 months**Mean amount of intervention (hours/week):**ASD: 11.5 Language Delay: 1.9Developmental Delay:8.5**Health-related outcomes:** NR**Modifiers of screening outcomes/performance:** NR |

| **Study Description Author/year:**Honda et al, 2009[13](#_ENREF_13) | **Baseline/Prescreening Characteristics** | **Screening and Diagnosis** | **Characteristics of Population Screened and/or Diagnosed** | **Screening Outcomes** |
| --- | --- | --- | --- | --- |
| **Country:** Japan**Study period:** 1989- 1992 **Inclusion/exclusion criteria:*** Children undergoing 18-month checkup in Yokohama
 | **Population characteristics****Population description:** Children undergoing 18-month check-up**Race/ethnicity, n (%):** NR**Age at screening, mean ± SD:** NR (18 month well child visit)**Sex, n (%):** NR**Risk factors:** NR**IQ, mean ± SD:** NR**Language development, mean ± SD:** NR**Adaptive behavior, mean ± SD:** NR**Family context:** NR | **Screening****Instrument/method:** YACHT 18 (Young Autism and other developmental disorders checkup tool) used at 18 month routine health check-up **Mode of administration:** In person**Setting:** Pediatric well-baby visits**Administrator:** Nursing staff**Scorer:** Nursing staff**Study definition of positive screen:** NR (Public health nurse assessment of all screening data)**Total number available to screen:** 3036**Total number screened:** 2,814**Number screening positive:** 402**Number screening negative:** 2412**Percent completing screening followup/diagnosis:** 0.82% (23/2814)**Diagnosis****Diagnostic process:** NR**Who diagnosed:** NR**Diagnoses, n** Among all participants:ASD: 5PDD-NOS: 10Learning disorders:1ADHD: 6Mental retardation: 4Cerebral palsy: 1Erb’s palsy: 1**Among those screening positive:**Total: 19ASD: 3PDD-NOS: 8Learning disorders: 1ADHD: 5Mental retardation: 2Cerebral palsy: 0Erb’s palsy:0**Among those screening negative** Total: 4ASD: 2PDD-NOS: 1Learning disorders: 0ADHD: 1Mental retardation: 0Cerebral palsy: 0Erb’s palsy: 0**Age at diagnosis, mean ± SD:** NR | **Screening** **Race/ethnicity, n (%):** NR**Age, mean ± SD:** NR**Sex, n (%):** NR**Risk factors:** NR**IQ, mean ± SD:** NR**Language development, mean ± SD:** NR**Adaptive behavior, mean ± SD:** NR**Family context:** NR**Diagnosis****Race/ethnicity, n (%):** NR**Age, mean ± SD:** NR**Sex, n (%):** NR **Risk factors:** NR**IQ, mean ± SD:** NR**ASD severity, mean ± SD:** NR**Language development, mean ± SD:** NR**Adaptive behavior, mean ± SD:** NR**Family context:** NR | **Performance characteristics (%)**YACHT (18 months, autistic disorder and PDD)Sensitivity: 79 Specificity: 11PPV: 58NPV: 25For any developmental disorder:Specificity: 86.3 (extraction stage: 2408/2791); 100 (refinement stage) Among IQ ≥70:Sensitivity: 86.7 (13/15)Among IQ ≤69:Sensitivity: 75 (6/8)**Other outcomes:** **Intermediate/Process outcomes****Age at diagnosis, mean ± SD:** NR**Time between screening and intervention, mean ± SD:** NR**Health-related outcomes:** NR**Modifiers of screening outcomes/performance:** NR |

| **Study Description Author/year:**Wetherby et al, 2008[14](#_ENREF_14) | **Baseline/Prescreening Characteristics** | **Screening and Diagnosis** | **Characteristics of Population Screened and/or Diagnosed** | **Screening Outcomes** |
| --- | --- | --- | --- | --- |
| **Country:** US**Study period:** June 1997 – November 2003**Inclusion/exclusion criteria:*** Between 4-10 years old
* Born between June 1997 and November 2003
 | **Population characteristics****Population description:** General population recruited from childcare and healthcare agencies**Race/ethnicity, n (%):**Caucasian: 3193 (59.3)African American: 1626 (30.2)Hispanic: 167 (3.1)Asian: 124 (2.3)Other: 275 (5.1)**Age at screening, mean ± SD:** 13.5 months ± 4.7 (at first screen)**Sex, n (%):**Female: 2633 (48.9)Male: 2752 (51.1)**Risk factors:** NR**IQ, mean ± SD:** NR**Language development, mean ± SD:** NR**Adaptive behavior, mean ± SD:** NR**Family context:****Parental education** Years of Education CompletedMothers: 14.3 ± 2.4Fathers: 14.3 ± 2.7**Parental age at birth of child**Mothers: 28.2 ± 6.2Fathers: 30.9 ± 7.0**Primary language spoken in home:** NR**Limited English proficiency:** NR | **Screening****Instrument/method:** Infant Toddler Checklist**Mode of administration:** Parent-rated, independently**Setting:** Home, clinic**Administrator:** NR**Scorer:** NR**Study definition of positive screen:** Score in the bottom 10th percentile on Social Composite, Symbolic composite or Total score on ITC *OR* bottom 10th percentile on speech composite on 2 consecutive ITCs**Total number available to screen:** 5385**Total number screened:** 5385**Number screening positive:** 969 (18%)**Number screening negative:**4416 (82%)**Percent completing screening followup/diagnosis:** Among those screening positive: NRAmong those screening negative: NR**Diagnosis****Diagnostic process:**Behavior Profile (CSBS), MullenVineland, ADOS, Social Communication Questionnaire**Who diagnosed:** NR**Diagnoses, n** ASD: 60 (56 of these had screened positive)Non-ASD diagnoses:NR**Age at diagnosis, range:** 4–10 years | **Screening** **Race/ethnicity, n (%):** NR**Age, mean ± SD:** NR**Sex, n (%):** NR**Risk factors:** NR**IQ, mean ± SD:** NR**Language development, mean ± SD:** NR**Adaptive behavior, mean ± SD:** NR**Family context:** NR**Diagnosis****Race/ethnicity, n (%):** NR**Age, mean ± SD:** NR**Sex, n (%):** NR**Risk factors:** NR**IQ, mean ± SD:** NR **ASD severity, mean ± SD:** NR**Language development, mean ± SD:** NR**Adaptive behavior, mean ± SD:** NR**Family context:** NR  | **Performance characteristics****Sensitivity:** 93.3**Other outcomes****Intermediate/Process outcomes****Time between screening and diagnosis, mean ± SD:** NR**Time between screening and intervention, mean ± SD:** NR**Health-related outcomes:** NR**Modifiers of screening outcomes/performance:** NR |

| **Study Description****Author/Year:**Dietz et al, 2007[15](#_ENREF_15) | **Baseline/Prescreening Characteristics** | **Screening and Diagnosis** | **Characteristics of Population Screened and/or Diagnosed** | **Screening Outcomes** |
| --- | --- | --- | --- | --- |
| **Country:** Netherlands**Study period:** October 1999-April 2002**Inclusion criteria:*** Children screened at well-baby visit at age 14-15 months

**Exclusion criteria:*** Parents did not cooperate (n=52)
* Screening lists incomplete or physician unable to pre-screen child usually due to language barrier (n=399)

Note: Population may overlap with Dietz et al[16](#_ENREF_16) | **Population characteristics****Population description:** Children screened at well-baby visit at age 14-15 months**Race/ethnicity, n (%):** NR**Age at screening:**Screen 1:14-15 monthsScreen 2: 16 ± 2months (from population screening)27 ± 6 months (from surveillance)**Sex, %: (n=173)**Female: 25Male: 75**Risk factors:** NR**DQ, n:** By compliance status:Early: 69.94 ± 17.96Late: 72.54 ± 18.88Noncompliance: 89.19 ± 14.95 **Language development, mean ± SD:** NR**Adaptive behavior, mean ± SD:** NR**Family context:** NR | **Screening****Instrument/method:** 2-stage screening: 4- & 14-item ESAT + developmental surveillanceChildren initially prescreened with 4-item ESAT by their doctor; parents of those who screened positive or those identified by surveillance were invited to have a 1.5 hr home visit with a child psychologist who conducted the 14-item ESAT **Mode of administration:** In person**Setting:** clinic; home**Administrator:** Trained child psychologist**Scorer:** Administrator**Study definition of positive screen:** Prescreen: negative answer by parent on 1/4 ESAT items; screening: >3 negative answers in 14-item ESAT by both parent and child psychologist**Total number available to screen:** 31,724Screen 1 (4-item ESAT): Total screened: 31,724Number screening positive: 370Number screening negative: 31,354Screen 2 (14-item ESAT)Total screened: 364 (255 of screen 1 positives & 109 through surveillance)Number screening positive: 173Number screening negative: 191**% completing screening followup/diagnosis:** 17.8% (66/370) of screen 1 positives 81.5 % (141/173) of screen 2 positives **Diagnosis****Diagnostic process:** 5 tests over 5 weeks including standardized parent interview, developmental history, cognitive testing (Bayley Scales, Mullen Scales of Early Learning, Psychoeducational Profile-Revised), Vineland Social-Emotional Early Childhood Scales, standardized behavior observation using ADOS or ADOS-G, pediatric examination and medical workupSubset of patients undergoing screening with SCQ had diagnostic workup including ADI-R**Who diagnosed:** Experienced child psychiatrist made a clinical judgment about whether the child would meet DSM-IV criteria of different diagnoses by age 3.5 years**Diagnoses, n** Screen 1:Total diagnosed: 66/255 complied (ASD=19, non-ASD=47)Screen 2:Total diagnosed: 141/173 (ASD=58; non-ASD=83)**Age at diagnosis, mean ± SD:** 3.5 years | **Screening** **Race/ethnicity, n (%):** NR**Age, mean ± SD:** NR**Sex, n (%):** NR**Risk factors:** NR**IQ, mean ± SD:** NR**Language development, mean ± SD:** NR**Adaptive behavior, mean ± SD:** NR**Family context:** NR**Diagnosis****Race/ethnicity, n (%):** NR**Age, mean ± SD:** NR**Sex, n (%):**NR **Risk factors:** NR**IQ, mean ± SD:** NR**ASD severity, mean ± SD:** NR**Language development, mean ± SD:** NR**Adaptive behavior, mean ± SD:** NR**Family context:** NR | **Performance characteristics** (%):4-item ESAT + developmental surveillance:PPV: 2914-item ESAT:PPV: 41.1 **Other outcomes****Intermediate/Process outcomes****Time between screening and diagnosis, mean ± SD:** NR**Time between screening and intervention, mean ± SD:** NR**Health-related outcomes:** NR**Modifiers of screening outcomes/performance:** NR |

| **Study Description Author/Year:**VanDenHeuvel et al, 2007[17](#_ENREF_17) | **Baseline/Prescreening Characteristics** | **Screening and Diagnosis** | **Characteristics of Population Screened and/or Diagnosed** | **Screening Outcomes** |
| --- | --- | --- | --- | --- |
| **Country:** UK**Study period:** NR**Inclusion/exclusion criteria:*** 18 month olds
* Attending well check visit
 | **Population characteristics****Population description:** 2117 infants attending the routine 18-month developmental assessment **Race/ethnicity, n (%):** NR**Age at screening, mean ± SD:** 18 months**Sex, n (%):**Female: 1029 (49%)Male: 1088 (51%)**Risk factors:** NR**IQ, mean ± SD:** NR**Language development, mean ± SD:** NR**Adaptive behavior, mean ± SD:** NR**Family context****SES:** Representative of the area social class distribution based on 2002 census data**Primary language spoken in home:** NR**Limited English proficiency:** NR | **Screening****Instrument/method:** Checklist for Autism in Toddlers (CHAT), 14- item interviewer-administered instrument divided into 2 sections: Section A includes 9 items administered to the parent and Section B includes 5 items based on interviewer observations of the infant**Mode of administration:** Interview/observation **Setting:** Clinic**Administrator:** Public health nurses**Scorer:** Public health nurses**Study definition of positive screen:** Each completed CHAT was scored into 1 of 3 categories: high, medium, or low risk for autism, based on a standard scoring system. If an infant scored medium or high risk for autism at the first administration, a second screening was administered approximately 1 month later.**Total number available to screen:** 2684**Total number screened:** 2117**Number screening positive:** 29 **Number screening negative:** 2088**% completing screening followup:** 24.1 (7/29) **% completing diagnosis:**Overall: 0.57 (12/2117)Screen Positive: 41.4 (12/29)Screen Negative: 0**Diagnosis****Diagnostic process:** Diagnostic assessment by experienced psychologist**Who diagnosed:** Clinical psychologist**Diagnoses, n** **Among those screening positive**ASD: 7 (high risk) **Non-ASD diagnoses, n**Learning disability: 2Low risk autism: 3 **Among those screening negative:** NR**Age at diagnosis, mean ± SD:** NR | **Screening** **Race/ethnicity, n (%):** NR**Age, mean ± SD:** NR**Sex, n (%):** NR**Risk factors:** NR**IQ, mean ± SD:** NR**Language development, mean ± SD:** NR**Adaptive behavior, mean ± SD:** NR**Family context:** NR**Diagnosis****Race/ethnicity, n (%):** NR**Age, mean ± SD:** NR**Sex, n (%):** NR**Risk factors:** NR**IQ, mean ± SD:** NR**ASD severity, mean ± SD:** NR**Language development, mean ± SD:** NR**Adaptive behavior, mean ± SD:** NR**Family context:** NR | **Performance characteristics (%)**PPV:58.3 (7/12)**Other outcomes:** **Intermediate/Process outcomes****Time between screening and diagnosis:** NR**Time between screening and intervention:** NR**Health-related outcomes:** NR |

| **Study Description****Author/Year:**Dietz et al, 2006[16](#_ENREF_16) | **Baseline/Prescreening Characteristics** | **Screening and Diagnosis** | **Characteristics of Population Screened and/or Diagnosed** | **Screening Outcomes** |
| --- | --- | --- | --- | --- |
| **Country:** Netherlands**Study period:** October 1999-April 2002**Inclusion criteria:*** Children screened at well-baby visit at age 14-15 months

**Exclusion criteria:*** Parents did not cooperate (n=52)
* Screening lists incomplete or physician unable to pre-screen child usually due to language barrier (n=399)

Note: Population may overlap with Dietz et al[15](#_ENREF_15) | **Population characteristics****Population description:** Children screened at well-baby visit at age 14-15 months **Race/ethnicity, n (%):** NR**Age at screening, mean months ± SD:** 14.91 ± 1.37**Sex, %:**Female: 37%Male: 63%**Risk factors:** NR**IQ, n:**Mullen Scales of Early LearningLow (<70)Screen Positive: 26Screen Negative: 5Below average (70-85)Screen Positive: 30Screen Negative: 22Average (>85)Screen Positive: 44Screen Negative: 128**Language development, mean ± SD:** NR**Adaptive behavior, mean ± SD:** NR**Family context:** NR | **Screening****Instrument/method:** Children initially prescreened with 4-item ESAT by their doctor; parents of those who screened positive were invited to have a 1.5 hr home visit with a child psychologist who conducted the 14-item ESAT **Mode of administration:** In person**Setting:** Clinic; home**Administrator:** Trained child psychologist**Scorer:** Administrator**Study definition of positive screen:** Prescreen: negative answer by parent on 1/4 ESAT items; screening: >3 negative answers in 14-item ESAT by both parent and child psychologist**Total number available to pre-screen:** 31,724**Total number pre-screened:** 31,273**Total number available to screen (test positives from prescreen):** 370**Total number screened:** 255 (69%)**Number screening positive:** 100**Number screening negative:** 155**% completing screening followup/diagnosis**: Screen positive: 73 (29% of screened population)Screen negative: None**Diagnosis****Diagnostic process:** 5 tests over 5 weeks including observation of child behavior in small group of very young children and their parents, standardized parent interview, developmental history, Vineland Social-Emotional Early Childhood Scales, standardized behavior observation using ADOS or ADOS-G, pediatric examination and medical workup**Who diagnosed:** Experienced child psychiatrist made a clinical judgment about whether the child would meet DSM-IV criteria of different diagnoses by age 3.5 years**Diagnoses, n** ASD: 18Non-ASD diagnoses, nMental retardation: 13Language disorder: 22Other DSM-IV: 7Other developmental disorder/ classification:13**Age at diagnosis, mean ± SD:** NR | **Screening** **Race/ethnicity, n (%):** NR**Age, mean ± SD:** NR**Sex, n (%):** NR**Risk factors:** NR**IQ, mean ± SD:** NR**Language development, mean ± SD:** NR**Adaptive behavior, mean ± SD:** NR**Family context:** NR**Diagnosis****Race/ethnicity, n (%):** NR**Age, mean ± SD:** NR**Sex, n (%):** NR**Risk factors:** NR**IQ, mean ± SD:** NR**ASD severity, mean ± SD:** NR**Language development, mean ± SD:** NR**Adaptive behavior, mean ± SD:** NR**Family context:** NR | **Performance characteristics: ESAT (%)**PPV:25**Other outcomes****Intermediate/Process outcomes****Time between screening and diagnosis, mean ± SD:** NR**Time between screening and intervention, mean ± SD:** NR**Health-related outcomes:** NR**Modifiers of screening outcomes/performance:** NR |

| Study Description Author/Year:Baird et al, 2000[18](#_ENREF_18) | **Baseline/Prescreening Characteristics** | Screening and Diagnosis | **Characteristics of Population Screened and/or Diagnosed** | **Screening Outcomes** |
| --- | --- | --- | --- | --- |
| Country: UKStudy period: NR**Inclusion/exclusion criteria:*** Children with profound developmental delay excluded
 | Population characteristicsPopulation description: 12-month birth cohort of children in the south- east Thames regionRace/ethnicity, n (%)CaucasianASD: 101 (100)Other: 95 (100)Typically Developing: 117 (100)Age at screening, mean ± SD: 18.7 months ± 1.1 monthsSex, n (%): NRRisk factors: NRIQ, mean ±SD: NRLanguage development, mean ± SD: NRAdaptive behavior, mean ± SD: NRFamily context: NR | ScreeningInstrument/method: CHATMode of administration:Stage 1: Mail (n=2541) and in person (n=13,694)Stage 2: re-administration of the CHAT 1 month later Setting: Primary care clinicAdministrator: Stage 1: Primary health care providers (n=13,694) and via mail (n=2541)Stage 2: Research teamScorer: Stage 1: Primary health care providerStage 2: Research team Study definition of positive screen:High Risk: Failure of all 5 critical itemsMedium Risk: Failure of item A7 and Biv or only A7Total number available to screen: 40,818Total number screened: Stage 1: 16,235Stage 2: 60 Number screening positive:CHAT–Stage 1 High Risk: 38 Medium Risk: 369CHAT–Stage 2 High Risk: 12 Medium Risk: 22 Number screening negative:Stage 1: 15,828Stage 2: 26/60 % completing screening followup/diagnosis: CHAT-1: 100CHAT-2: 0.37 (60/16,235)DiagnosisDiagnostic process: Autism Diagnostic Interview–Revised, Leiter International Performance Scale *or* Kaufman Assessment Battery for Children, Reynell Developmental Language Scales *or* Clinical Evaluation of Language Fundamentals–Preschool *or* Clinical Evaluation of Language Fundamentals–Revised; structured interactive assessmentWho diagnosed: 3 clinicians experienced in diagnosing autism and related disordersDiagnoses, nCHAT-1:Among screen positives:Autism: 19PDD: 14Other diagnosis: 44Clinically normal: 330Among screen negatives:Autism: 31PDD: 30No risk: 15,767CHAT-2:Among screen positives:Autism: 10PDD: 10Other diagnosis: 11Clinically normal: 3Among screen negatives: NRAge at diagnosis, mean ± SD: NR | Screening Race/ethnicity, n (%): NRAge, mean ± SD: NRSex, n (%): NRRisk factors: NRIQ, mean ±SD: NRLanguage development, mean ± SD: NRAdaptive behavior, mean ± SD: NRFamily context: NRDiagnosisRace/ethnicity, n (%): NRAge, mean ± SD: NR Sex, n (%):FemaleASD: 3 (3)Aspergers: 0 (0)PDD-NOS: 8 (9)MaleASD: 42 (45)Aspergers: 5 (5)PDD-NOS: 36 (38)Risk factors: NRIQ, mean ±SD: NRASD severity, mean ± SD: NRLanguage development, mean ± SD: NRAdaptive behavior, mean ± SD: NRFamily context: NR | Performance characteristics (%)Stage 1 screening, high risk threshold*ASD (including Asperger’s)*Sensitivity: 20Specificity: 99.8PPV: 26.3*PDD*Sensitivity: 2.3Specificity: 99.8PPV: 2.6*All PDDs*Sensitivity: 11.7Specificity: 99.8PPV: 28.9Stage 1 screening, combined high and medium risk*ASD*Sensitivity: 38Specificity: 97.6PPV: 4.7*PDD*Sensitivity: 31.8Specificity: 97.6PPV: 3.4*All PDDs*Sensitivity: 35.1Specificity: 97.7PPV: 8.1Stage 2 screening,\*\* combined high and medium risk*All PDDs*PPV: 58.8Other outcomes\*Comparison of TP and FN at initial screen*Gender (n)*ASD TP Female: 2 TP Male: 11 FN Female: 1 FN Male: 12PDD TP Female: 1 TP Male: 19 FN Female: 1 FN Male: 5Age at Diagnosis mean ± SD*ASD:* TP=13, FN=13 TP: 47.5 ± 14.3 months FN: 61.5 ± 12.2 months*PDD:* TP=11, FN=6 TP: 46.4 ± 7.5 months FN: 65 ± 13.8 monthsIQ mean ± SD*ASD* TP: 65.7 ± 21.8 FN: 88.7 ± 16.9*PDD* TP: 99.5 ± 15 FN: 83.2 ± 10.9Intermediate/Process outcomesTime between screening and diagnosis, mean ± SD: NRTime between screening and intervention, mean ± SD: NRHealth-related outcomes: NR |

ADHD=attention deficit hyperactivity disorder; ADI-R=Autism Diagnostic Interview-Revised; ADOS=Autism Diagnostic Observation Schedule; ADOS-G=Autism Diagnostic Observation Schedule-Generic; ADOS-T=Autism Diagnostic Observation Schedule–Toddler Module; ASD=Autism Spectrum Disorder; CARS=Childhood Autism Rating Scale; CHAT=Checklist for Autism in Toddlers; CSBS-DP=Communication and Symbolic Behavior Scales–Developmental Profile; CSBS-DP-T=Communication and Symbolic Behavior Scales–Developmental Profile-Toddlers; DSM-IV=Diagnostic and Statistical Manual of Mental Disorders–Fourth Edition; ESAT=Early Screening for Autistic Traits; IQ=Intelligence Quotient; ITC=Infant Toddler Checklist; JA-OBS=Joint Attention Observation Schedule; M-CHAT=Modified Checklist for Autism in Toddlers; M-CHAT-F=Modified Checklist for Autism in Toddlers-Followup Interview; MSEL=Mullen Scales of Early Learning; NR=not reported; PDD-NOS=Pervasive Developmental Disorder-Not Otherwise Specified; SACS=Social Attention and Communication Study; SCQ=Social Communication Questionnaire; SD=standard deviation; SES=socioeconomic status; VABS=Vineland Adaptive Behavior Scales; YACHT=Young Autism and other developmental disorders Checkup Tool.