

## Supplemental Online Content

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This supplemental material has been provided by the authors to give readers additional information about their work.

eAppendix 1. *International Classification of Diseases, Ninth Revision (ICD-9) and Tenth Revision (ICD-10) Codes for Down Syndrome*

<i>ICD-9</i>	<i>ICD-10</i>
758	Q90
	Q90.0
	Q90.1 (Mosaic Down syndrome)
	Q90.2 (Translocation)
	Q90.9 (Unspecified)

eAppendix 2. Algorithm For Alzheimer’s Disease

From <https://www2.ccwdata.org/web/guest/condition-categories-chronic>

Valid ICD-9 Codes	Valid ICD-10 codes	Number / Types of claims
331.0, 331.11, 331.19, 331.2, 331.7, 290.0, 290.10, 290.11, 290.12, 290.13, 290.20, 290.21, 290.3, 290.40, 290.41, 290.42, 290.43, 294.0, 294.10, 294.11, 294.20, 294.21, 294.8, 797 (any DX on the claim)	F01.50, F01.51, F02.80, F02.81, F03.90, F03.91, F04, F05, F06.1, F06.8, G13.8, G30.0, G30.1, G30.8, G30.9, G31.01, G31.09, G31.1, G31.2, G94, R41.81, R54 (any DX on the claim)	At least 1 inpatient, SNF, HHA, HOP, or Carrier claim with DX code

SNF: skilled nursing facility;  
HHA: home health agency  
HOP: hospital outpatient.

eTable 1. Bias Analysis Assessing Misclassification of Alzheimer Dementia in Medicaid Compared With Medicare

1a. Sensitivity and specificity calculation by age group

	Total			
<b>Age</b>	35-54			
		<b>Medicaid</b>		
		+	-	
<b>Medicare</b>	+	18388	5982	
	-	1092	32738	
	<b>Sensitivity=</b>	0.75	<b>Specificity=</b>	0.97
<b>Age</b>	44-54			
		<b>Medicaid</b>		
		+	-	
<b>Medicare</b>	+	2744	1136	
	-	261	9046	
	<b>Sensitivity=</b>	0.71	<b>Specificity=</b>	0.97
<b>Age</b>	55-64			
		<b>Medicaid</b>		
		+	-	
<b>Medicare</b>	+	9414	2786	
	-	511	6572	
	<b>Sensitivity=</b>	0.77	<b>Specificity=</b>	0.93
<b>Age</b>	65+			
		<b>Medicaid</b>		
		+	-	
<b>Medicare</b>	+	5305	1617	
	-	234	1815	
	<b>Sensitivity=</b>	0.77	<b>Specificity=</b>	0.89

1b. Calculations for correction of misclassification in Medicaid

Age	Full N+	Full N-	No Medicaid N+	No Medicaid N-	Corrected N+	Corrected N-	%
35-44	5043	18204	4522	11865	4985	18261	1.14
45-54	14855	11621	13866	9039	14921	11554	-0.45
55-64	8811	4125	8213	3157	8858	4077	-0.53

Full= full Medicaid + Medicare Sample

No Medicaid= Cases and non cases with any Medicare claims

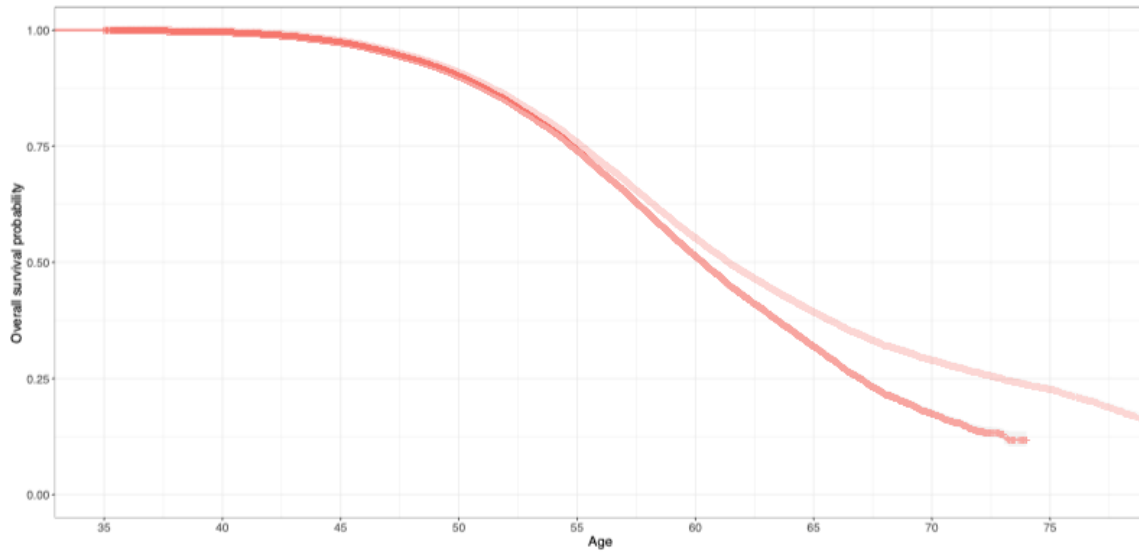
Corrected- Total cases we would expect correcting for imperfect sensitivity and specificity in Medicaid claims

eTable 2. Incidence Rate by Year and Demographics Among Adults With Down Syndrome

	2012		2013		2014		2015		2016		2017		2018		2019	
	PY	85 486	PY	88 513	PY	91846	PY	94292	PY	95 523	PY	95 818	PY	95 824	PY	94 757
	N	Rate	N	Rate	N	Rate	N	Rate	N	Rate	N	Rate	N	Rate	N	Rate
<b>Any Alzheimer’s dementia</b>	2062	24.1	2120	24.0	2058	22.4	2195	23.3	2238	23.4	2105	22.0	2010	21.0	1798	19.0
<b>Sex</b>																
Male	1140	24.9	1148	24.3	1105	22.6	1145	22.9	1191	23.5	1126	22.2	1034	20.4	990	19.9
Female	922	23.2	972	23.5	953	22.2	1050	23.8	1047	23.3	979	21.7	976	21.6	808	18.0
<b>Age</b>																
<35																
35-44	206	11.6	204	11.4	163	9.0	201	11.0	221	12.0	199	10.7	164	8.8	183	9.6
45-54	886	44.4	906	45.4	856	43.1	852	43.3	851	44.4	814	43.9	736	41.2	593	34.8
55-64	811	94.4	800	83.4	850	80.4	917	80.4	950	79.1	872	70.3	893	70.8	797	63.3
65+	159	68.0	210	79.2	189	65.5	225	72.8	216	144.9	220	64.3	217	62.0	225	62.6
Mean age, SD	54.1	7.6	54.2	7.8	54.8	7.8	54.9	7.8	54.8	8.1	55	8.0	55.6	8.2	55.5	8.7
Median age, SD	54	10.0	54	10.0	55	9.0	55	9.0	55	9.0	55	9.0	55	9.0	56	10.0
<b>Race ethnicity</b>																
Non-Hispanic White	1704	29.6	1748	29.6	1687	27.9	1772	29.0	1829	29.8	1670	27.4	1607	26.6	1397	23.5
Black	193	18.8	199	18.7	191	17.4	192	17.1	171	15.1	224	19.7	168	14.7	174	15.4
Mixed race / Other	11	9.0	14	10.8			22	14.7	28	18.3	19	12.2	26	16.7	13	8.3
Asian / PI	18	8.5	22	9.8	15	6.4	27	10.9	21	8.2	31	11.7	28	10.3	39	14.2
Native			10	13.1			15	18.1	18	21.5	10	11.8			13	15.3
Hispanic	114	9.0	114	8.4	132	9.2	152	9.8	152	9.5	140	8.5	165	9.8	149	8.7
<b>Enrollment</b>																
Medicaid only	220	5.9	190	4.8	231	5.4	254	5.6	301	6.5	305	6.4	255	5.2	277	5.6
Dual enrolled	1579	45.0	1640	45.3	1588	41.9	1669	43.1	1727	44.5	1561	40.8	1528	40.4	1305	35.8
Medicare only	263	20.4	290	23.0	239	21.1	242	23.1	210	20.7	239	23.7	227	24.2	216	23.9

PY: Person years  
 PI: Pacific Islander  
 Rates per 1000 person years  
 Cells <10 are suppressed

eFigure 1. Alzheimer Dementia Incidence Among Those With Down Syndrome by Whether We Restrict to Those Entering the Study Younger Than Age 65 Years



Darker red: restricted to those entering the study  $\leq$  65 years of age  
Lighter red: full sample  
N=2780 excluded; 2.1% of full sample

eTable 3. Age at incident Alzheimer’s dementia and age at death with Alzheimer’s dementia in Medicaid and Medicare enrolled adults with Down syndrome, 2011-2019

	Age at incident Alzheimer’s dementia			Age at death		
	N	Mean (SD)	Median (IQR)	N	Mean (SD)	Median (IQR)
<b>Total</b>	16392	54.5 (7.4)	54.6 (9.3)	15369	59.2 (6.9)	59.0 (8)
<b>Race / Ethnicity</b>						
White	13493	55 (7.8)	54.9 (9.3)	13074	59.3 (6.8)	59.0 (8)
Black	1 524	55 (8.8)	54.9 (10.9)	1221	59.0 (8.0)	58.4 (10)
Hispanic	1 122	54.2 (9.2)	53.8 (10.9)	731	58.5 (7.8)	58.9 (10)
Mixed race	142	52.8 (8.2)	54.5 (10.7)	97	58.2 (7.0)	58.6 (8)
Asian / PI	203	54.1 (9.2)	54.0 (11.5)	101	59.9 (7.7)	60.0 (8)
Native	88	52.4 (7.8)	52.3 (9.6)	63	57.8 (7.1)	58.0 (9)

SD: Standard deviation  
IQR: Interquartile range

eTable 4. Assessment of imputation for missing race among Medicaid enrollees with Down syndrome.

			% w/ Alzheimer's dementia		Age at Alzheimer's dementia	
	N after imputation	N not imputed	N after imputation	N not imputed	Imputed	Not imputed
White	73803	59987	27.3	27.2	54.5	54.5
Black	13758	10259	15.6	14.3	54.5	54.4
PI	1036	261	13.4	9.3	53.6	56.0
Asian	3521	2092	7.9	8.5	54.4	51.7
Native America	841	795	10.2	10.6	51.6	51.5
Multiple	6573	1279	13.2	6.9	56.8	54.0

eFigure. Age distribution comparing age at death for adults with Down syndrome with and without Alzheimer's dementia

