

595 **Supplementary Table 1 Adjusted<sup>a</sup> baseline regional brain volumes and annual**  
 596 **rates of change in extratemporal regional brain volumes according to hearing**  
 597 **status**  
 598

	Baseline Volume (cm <sup>3</sup> ) <sup>b</sup>		Annual Rate of Change (cm <sup>3</sup> /year)			Effect Size <sup>d</sup>
	Normal Hearing Mean (95%CI)	Hearing Impairment Mean (95%CI)	Normal Hearing Mean (95%CI)	Hearing Impairment Mean (95%CI)	Difference <sup>c</sup> Mean (95%CI)	
<b>Frontal</b>						
Superior	19.0 (18.4 – 19.64)	18.8 (18.0 – 19.5)	-0.11 (-0.15 - -0.06)**	-0.11 (-0.17 - -0.05)**	-0.001 (-0.08 – 0.08)	-0.01
Middle	39.3 (38.2 – 40.3)	39.4 (38.1 – 40.7)	-0.31 (-0.38 - -0.25)**	-0.37 (-0.46 - -0.28)**	-0.06 (-0.17 - 0.05)	-0.39
Inferior	20.9 (20.2 – 21.7)	22.0 (21.1-22.9)	-0.10 (-0.15 - -0.05)**	-0.17 (-0.24 - -0.10)**	-0.07 (-0.16 - 0.02)	-0.52
Medial	24.2 (23.6 – 24.9)	25.1 (24.3 – 26.0)	-0.10 (-0.14 - -0.06)**	-0.13 (-0.18 - -0.07)**	-0.03 (-0.10 - 0.05)	-0.24
Orbitofrontal	24.1 (23.4 – 24.8)	24.3 (23.4 – 25.2)	-0.07 (-0.10 - -0.03)**	-0.09 (-0.14 - -0.05)**	-0.03 (-0.08 - 0.03)	-0.35
<b>Sensorimotor</b>						
Precentral	27.5 (26.7 – 28.2)	27.3 (26.3 – 28.2)	-0.22 (-0.28 - -0.16)**	-0.27 (-0.35 - -0.19)**	-0.05 (-0.16 - 0.05)	-0.33
Postcentral	21.0 (20.3 – 21.7)	21.4 (20.6 – 22.2)	-0.20 (-0.25 - -0.14)**	-0.28 (-0.35 - -0.21)**	-0.08 (-0.18 - 0.01)	-0.59
<b>Parietal</b>						
Superior	30.2 (29.3 – 31.1)	30.2 (29.1 – 31.3)	-0.28 (-0.32 - -0.23)**	-0.19 (-0.25 - -0.13)**	0.09 (0.01 – 0.17) <sup>+</sup>	0.88
Supramarginal	11.1 (10.7 – 11.6)	10.9 (10.3 – 11.5)	-0.11 (-0.14 - -0.08)**	-0.10 (-0.14 - -0.06)**	0.01 (-0.04 – 0.06)	0.13
Angular gyrus	17.8 (17.1 – 18.6)	18.4 (17.5 – 19.3)	-0.12 (-0.16 - -0.08)**	-0.15 (-0.20 - -0.10)**	-0.03 (-0.10 – 0.03)	-0.44
<b>Occipital</b>						
Superior gyrus	11.0 (10.6 – 11.4)	10.5 (9.9 – 11.1)	-0.11 (-0.14 - -0.09)**	-0.08 (-0.12 - -0.05)**	0.03 (-0.01 - 0.08)	0.61
Middle	10.8 (10.4 – 11.3)	10.9 (10.4 – 11.5)	-0.08 (-0.11 - -0.05)**	-0.07 (-0.11 - -0.03) <sup>+</sup>	0.01 (-0.05 - 0.07)	0.11
Inferior	6.02 (5.77 – 6.27)	6.00 (5.66 – 6.29)	-0.03 (-0.05 – 0.0) <sup>+</sup>	-0.05 (-0.07 - -0.02) <sup>+</sup>	-0.02 (-0.06 - 0.02)	-0.49
Occipitotemporal	32.6	32.5	-0.05	-0.07	-0.02	-0.19

	(31.6 – 33.5)	(31.3 – 33.6)	(-0.10 – 0.00) <sup>+</sup>	(-0.14 - -0.01) <sup>+</sup>	(-0.11 - 0.06)	
Occipital pole	6.79 (6.53 – 7.05)	6.6 (6.3 – 7.0)	-0.08 (-0.09 - -0.06) <sup>**</sup>	-0.06 (-0.08 - -0.03) <sup>**</sup>	0.02 (-0.01 - 0.05)	0.90
<b>Other regions</b>						
Cingulate gyrus	24.0 (23.3 – 24.8)	24.2 (23.3 – 25.2)	-0.19 (-0.23 - -0.15) <sup>**</sup>	-0.28 (-0.33 - -0.22) <sup>**</sup>	-0.09 (-0.16 - -0.01) <sup>+</sup>	-0.72
Insula	15.2 (14.7 – 15.6)	15.5 (15.0 – 16.1)	0.01 (-0.02 – 0.04)	-0.02 (-0.06 – 0.02)	<b>p = .02</b> -0.03 (-0.08 - 0.02)	-0.53
Precuneus	5.32 (5.11 – 5.54)	5.52 (5.24 – 5.80)	-0.03 (-0.04 - -0.02) <sup>**</sup>	-0.05 (-0.06 - -0.03) <sup>**</sup>	-0.02 (-0.04 – 0.004)	-0.72
Cuneus	81.3 (78.0 – 84.5)	76.5 (72.4 – 80.6)	-0.85 (-1.07 - -0.63) <sup>**</sup>	-0.55 (-0.84 - -0.25) <sup>**</sup>	0.30 (-0.08 - 0.69)	0.63
	<b>p</b> <b>=0.03</b>					

599

600 Statistical significance: + p &lt; .05, \* p &lt; .01, \*\* p &lt; .001

601

602 Abbreviations: vCSF = ventricular CSF

603

604 <sup>a</sup> All models included covariates of ICV, sex, baseline age, hypertension, smoking,  
605 hearing impairment, time (years of follow-up from baseline), and two-way interactions of  
606 time with hearing impairment, age, and sex.

607

608 <sup>b</sup> There were no significant differences in baseline regional brain volumes between  
609 individuals with normal hearing and hearing impairment except for cuneus.

610

611 <sup>c</sup> Difference is the (rate of change in hearing impairment) - (rate of change in normal  
612 hearing). Therefore, negative values indicate greater annual rates of atrophy in  
613 individuals with hearing impairment compared to those with normal hearing.

614

615 <sup>d</sup> Effect size is calculated as the difference in rates of change between those with  
616 hearing impairment and normal hearing divided by the corresponding standard deviation  
617 of the rate of change.

618

619

620

621