

**Table S7. Fraction of local heritability recovered in simulation (normal allelic effects, genotyped SNPs tested).**

Low-frequency un-typed causal variants:										
# casuals	$h_{\text{GWAS}}^2$	$h_{\text{GWAS,joint}}^2$	Gain	$h_g^2$	Gain	$h_{\text{gLDAK}}^2$	Gain	$h_{\text{gLDAK}}^2$	Gain	$P(h_{\text{gLDAK}}^2 \text{ vs. } h_{\text{gLDAK}}^2)$
1	0.23	0.26 (0.03)	1.15	0.26 (0.06)	1.14	0.37 (0.08)	1.62	0.24 (0.05)	1.02	$1.7 \times 10^{-01}$
2	0.29	0.36 (0.02)	<b>1.25</b>	0.30 (0.05)	1.04	0.40 (0.07)	1.39	0.40 (0.05)	<b>1.38</b>	$9.8 \times 10^{-01}$
3	0.26	0.31 (0.02)	1.20	0.31 (0.05)	1.19	0.52 (0.07)	<b>1.99</b>	0.33 (0.06)	1.26	$4.2 \times 10^{-02}$
5	0.22	0.25 (0.02)	1.12	0.26 (0.06)	1.18	0.36 (0.07)	1.65	0.37 (0.06)	<b>1.68</b>	$9.4 \times 10^{-01}$
10	0.16	0.24 (0.02)	<b>1.50</b>	0.25 (0.06)	1.56	0.43 (0.07)	<b>2.66</b>	0.36 (0.07)	<b>2.26</b>	$4.9 \times 10^{-01}$
Average	0.23	0.28 (0.07)	1.24	0.28 (0.07)	1.20	0.42 (0.07)	1.81	0.34 (0.07)	1.47	

  

Common un-typed causal variants:										
# casuals	$h_{\text{GWAS}}^2$	$h_{\text{GWAS,joint}}^2$	Gain	$h_g^2$	Gain	$h_{\text{gLDAK}}^2$	Gain	$h_{\text{gLDAK}}^2$	Gain	$P(h_{\text{gLDAK}}^2 \text{ vs. } h_{\text{gLDAK}}^2)$
1	0.68	0.71 (0.03)	1.05	0.80 (0.07)	1.18	0.69 (0.08)	1.01	0.82 (0.07)	1.20	$2.1 \times 10^{-01}$
2	0.58	0.59 (0.03)	1.02	0.75 (0.06)	<b>1.29</b>	0.69 (0.08)	1.18	0.81 (0.07)	<b>1.39</b>	$2.8 \times 10^{-01}$
3	0.51	0.59 (0.03)	<b>1.15</b>	0.80 (0.05)	<b>1.57</b>	0.76 (0.07)	<b>1.48</b>	0.83 (0.06)	<b>1.64</b>	$3.8 \times 10^{-01}$
5	0.44	0.49 (0.03)	1.11	0.75 (0.07)	<b>1.72</b>	0.68 (0.09)	<b>1.54</b>	0.80 (0.06)	<b>1.82</b>	$2.5 \times 10^{-01}$
10	0.25	0.38 (0.02)	<b>1.52</b>	0.76 (0.05)	<b>3.06</b>	0.68 (0.07)	<b>2.72</b>	0.82 (0.07)	<b>3.29</b>	$1.4 \times 10^{-01}$
Average	0.49	0.55 (0.07)	1.13	0.77 (0.07)	1.58	0.70 (0.07)	1.42	0.82 (0.07)	1.67	