MAX INDEPENDENT SET is a paradigmatic problem in theoretical computer science and numerous studies tackle its resolution by exact algorithms with non-trivial worst-case complexity. The best such complexity is, to our knowledge, the $O^*(1.1889^n)$ algorithm claimed by (J. M. Robson, Finding a maximum independent set in time $O(2^{n/4})$, Technical Report 1251-01, LaBRI, Université de Bordeaux I, 2001) in his unpublished technical report. We also quote the $O^*(1.2210^n)$ algorithm by (F. V. Fomin, F. Grandoni and D. Kratsch, Measure and conquer: a simple $O(2^{0.288n})$ independent set algorithm, Proc. SODA’06, pages 18–25, 2006), that is the best published result about MAX INDEPENDENT SET. In this paper we settle MAX INDEPENDENT SET in (connected) graphs with “small” average degree, more precisely with average degree at most 3, 4, 5 and 6. Dealing with exact computation of MAX INDEPENDENT SET in graphs of average degree at most 3, the best bound known is the recent $O^*(1.0977^n)$ bound by (N. Bourgeois, B. Escoffier and V. Th. Paschos, An $O^*(1.0977^n)$ exact algorithm for MAX INDEPENDENT SET in sparse graphs, Proc. IWPEC’08, LNCS 5018, pages 55–65, 2008). Here we improve this result down to $O^*(1.0854^n)$ by proposing finer and more powerful reduction rules. We then propose a generic method showing how improvement of the worst-case complexity for MAX INDEPENDENT SET in graphs of average degree $d$ entails improvement of it in any graph of average degree greater than $d$ and, based upon it, we tackle MAX INDEPENDENT SET in graphs of average degree 4, 5 and 6. For MAX INDEPENDENT SET in graphs with average degree 4, we provide an upper complexity bound of $O^*(1.1571^n)$, obviously still valid for graphs of maximum degree 4, that outperforms the best known bound of $O^*(1.1713^n)$ by (R. Beigel, Finding maximum independent sets in sparse and general graphs, Proc. SODA’99, pages 856–857, 1999). For MAX INDEPENDENT SET in graphs of average degree at most 5 and 6, we provide bounds of $O^*(1.1969^n)$ and $O^*(1.2149^n)$, respectively, that improve upon the corresponding bounds of $O^*(1.2023^n)$ and $O^*(1.2172^n)$ in graphs of maximum degree 5 and 6 by (Fomin et al., 2006). Let us remark that in the cases of graphs of average degree at most 3 and 4, our bounds outerperform the $O^*(1.1889^n)$ claimed by (Robson, 2001).