

Lotto	Chances for lotto jackpot		
	Not winning	Winning once	Winning twice
Lotto 7/37	0.99951 (99.951%)	4.854×10^{-4} (1 in 2060)	1.1787×10^{-7} (1 in 8,483,858)
Lotto 6/49	0.9996425 (99.964%)	3.574×10^{-4} (1 in 2797)	6.39×10^{-8} (1 in 15,649,363)
Lotto 6/59	0.999889 (99.9889%)	1.11×10^{-4} (1 in 9012)	6.156×10^{-9} (1 in 162,432,101)
Lotto 7/45	0.9998898 (99.98898%)	1.102×10^{-4} (1 in 9077)	6.069×10^{-9} (1 in 164,762,946)
Euro Millions	0.999964 (99.9964%)	3.575×10^{-5} (1 in 27,968)	6.392×10^{-10} (1 in 1,564,432,816)
Powerball USA	0.999983 (99.9983%)	1.711×10^{-5} (1 in 58,441)	1.464×10^{-10} (1 in 6,830,646,636)
Mega Millions USA	0.999835 (99.9835%)	1.6524×10^{-5} (1 in 60,516)	1.3653×10^{-10} (1 in 7,324,268,425)
Lotto 6/90	0.999992 (99.9992%)	8.03×10^{-6} (1 in 124,524)	3.2245×10^{-11} (1 in 31,012,167,250)

Table 4.2. Cumulative chances for jackpot from 5000 wagers

the wagers are; your chance of not winning the jackpot even once is close to 100% in all the lotteries despite the 5000 wagers.

There is another issue, which is that it takes a few draws for jackpot rollovers to build up in order that one-half the announced jackpot times the chance for the jackpot exceeds the cost of the wager. For example, USA's Powerball lotto had a chance (in 2019) of about 1 in 292 million for the jackpot. So if the minimum cost of a wager were \$1, then the announced jackpot would need to be at least twice \$292 million. If the minimum cost were \$2, then the announced jackpot would need to be four times \$292 million for our shrewd player. This happens only a few times a year. So our shrewd player can not make 5000 wagers in 50 years unless he/she either bets more in high-jackpot draws or joins a syndicate that pools from members and bets big.

Suppose such a syndicate played USA's Powerball which had a chance of about 1 in 292 million for the jackpot. Suppose the syndicate covered each of the 292, 201, 338 blocks, it would surely win (or split – see Section 9.3) the jackpot. But if it chose 292, 201, 338 blocks randomly, the chance