TABLE 1. COMPARISON OF SINGLE-GENE AND GENETICALLY COMPLEX CONDITIONS

Characteristic	Single-gene	Complex
Prevalence	Relatively rare (generally <1 in 1,000) but collectively numerous	Common (up to one person in three)
Underlying cause	Caused by DNA mutation in a single gene. Disease severity and age at onset varies according to the individual mutation and may be affected by the presence of other modifier genes.	Disease susceptibility influenced by DNA sequence variation in multiple genes interacting with environmental factors. Individual DNA sequence variations each contribute a small proportion of the overall risk of disease.
Role of environment	Often overridden by effect(s) of gene mutation	More important
Familial inheritance	Simple dominant, recessive or sex-linked	No simple mode of inheritance
Risk for relatives	More predictable and often high (typically around 25-50%)	Less predictable, often smaller risk
Gene identification before 2005	Over 2,000 disease genes identified	Fewer than 20 disease genes identified
Gene identification after 2005	Similar rate of discovery. Most disease genes not identified are exceptionally rare.	500 new disease genes located and many identified
Treatment	Limited	More likely to be effective
Examples	Cystic fibrosis, haemophilia, sickle cell disease, familial hypercholesterolaemia, Huntington's disease	Autism, asthma, cancer, coronary heart disease, diabetes, bipolar disorder, rheumatoid arthritis

Source: adapted from House of Lords Science and Technology Committee (2009)