

[Published: 16 April 2013](#)

Higher frequency of genetic variants conferring increased risk for ADRs for commonly used drugs treating cancer, AIDS and tuberculosis in persons of African descent

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DOI: <https://doi.org/10.1038/tpj.2013.13>

[The Pharmacogenomics Journal](#) **volume 14**, pages 160–170 (2014)

Abstract

There is established clinical evidence for differences in drug response, cure rates and survival outcomes between different ethnic populations, but the causes are poorly understood. Differences in frequencies of functional genetic variants in key drug response and metabolism genes may significantly influence drug response differences in different populations. To assess this, we genotyped 1330 individuals of African ($n=372$) and European ($n=958$) descent for 4535 single-nucleotide polymorphisms in 350 key drug absorption, distribution, metabolism, elimination and toxicity genes. Important and remarkable differences in the distribution of genetic variants were observed between Africans and Europeans and among the African populations. These could translate into significant differences in drug efficacy and safety profiles, and also in the required dose to achieve the desired therapeutic effect in different populations. Our data points to the need for population-specific genetic variation in personalizing medicine and care.