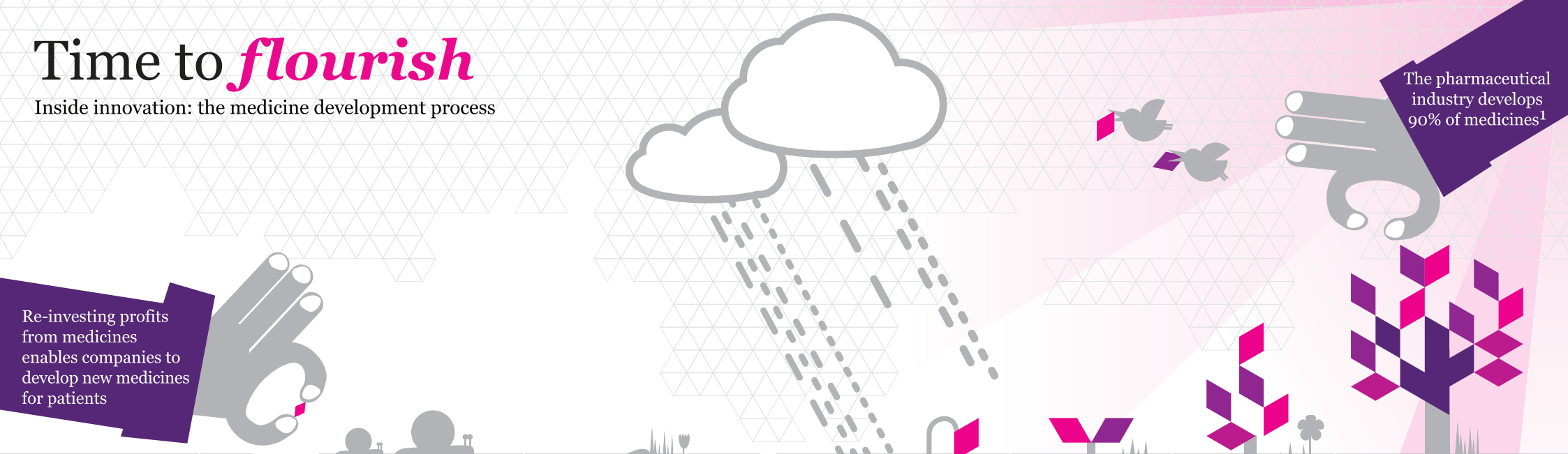


Time to flourish

Inside innovation: the medicine development process

The pharmaceutical industry develops 90% of medicines¹

Re-investing profits from medicines enables companies to develop new medicines for patients



Average number of years taken to develop successful medicine ²	4.5 years	5.5 years	7.0 years	8.5 years	11.0 years	12.5 years		
Average cost to research and develop successful medicine ³	£436 million	£533 million	£710 million	£916 million	£1.1 billion	£1.15 billion		
Number of medicinal candidates tested to achieve <u>one</u> approved medicine ⁴	5,000 - 10,000 candidates	10-20 candidates	5-10 candidates	2-5 candidates	1-2 candidates	1 medicine		
	Pre discovery Based on their disease focus, companies' scientists work to understand the disease	Drug discovery Researchers select a 'target', such as a gene or protein, then search for a molecule, or compound, that may act on the 'target' to alter the disease	Pre-clinical testing Early safety and efficacy tests are undertaken in computational models, cells and in animals	Phase 1 clinical trial The candidate medicine is tested in people for the first time. Studies are conducted with about 20 to 100 healthy volunteers	Phase 2 clinical trial Researchers evaluate the candidate medicine's efficacy in about 100 to 500 patients with the disease	Phase 3 clinical trial Researchers study the candidate medicine in about 1,000 to 5,000 patients to generate data about safety, efficacy and the overall benefit-risk relationship of the medicine	Licensing approval Information and results from all the studies is compiled and submitted to the regulatory agencies	Medicine available for patients The medicine is now licensed for use and patients may benefit from it, subject to value and cost-effectiveness assessments and local health budget availability

¹IFPMA analysis of the WHO Model Essential Medicines List (2006)
²Paul S et al How to improve R&D productivity: the pharmaceutical industry's grand challenge, Nature Reviews Drug Discovery, Volume 9 March 2010 (in 2010 prices based on Bank of England exchange rate)
³Paul S et al How to improve R&D productivity: the pharmaceutical industry's grand challenge, Nature Reviews Drug Discovery, Volume 9 March 2010
⁴PhRMA analysis, updated for data per Tufts Center for the Study of Drug Development (CSDD) database (1995)