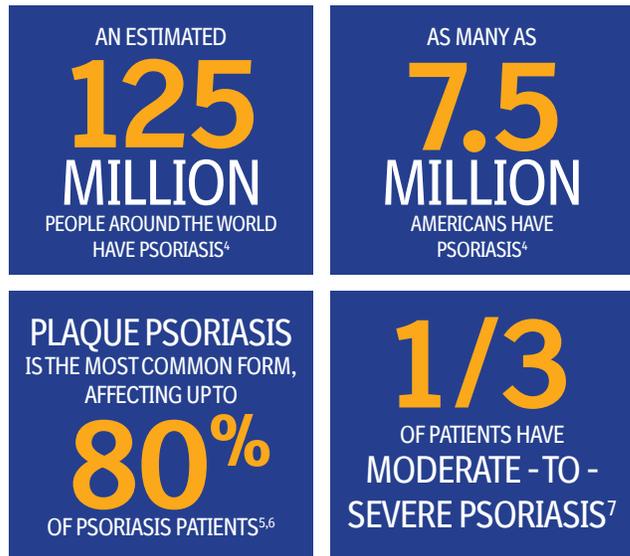
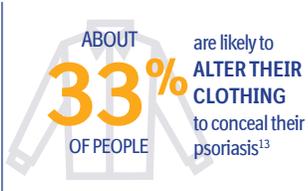
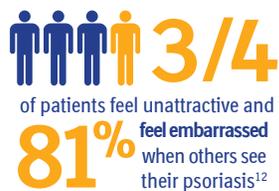


Overview of Psoriasis

Psoriasis is a chronic, systemic, immune-mediated disease that appears on people's skin and may cause itchy, red, scaly patches, everywhere on the body, including the nails. It develops when your own immune system mistakenly attacks and inflames or destroys healthy body tissue.^{1,2,3}



Burden of Psoriasis



People with psoriasis are also at an elevated risk to develop other chronic and serious health conditions including¹⁴

- Heart Disease
- Depression
- Crohn's Disease
- Diabetes
- Obesity

People with severe psoriasis have a



The Role the Immune System Plays in Psoriasis

- The abnormal immune response in psoriasis is driven by immune cells and proteins that are released, known as cytokines.
- A cytokine called interleukin-23 (**IL-23**) is one of the key drivers of psoriasis. **IL-23** activates and maintains several immune cells, like T-helper cells, and leads to the production of other cytokines including **IL-17** and **IL-22**.



- IL-17** and **IL-22** have direct effects on the skin inducing skin inflammation that contributes to appearance or flare up of psoriasis

Evaluating Psoriasis Severity

There are a wide range of tools available to measure psoriasis severity and skin clearance. The most widely used measure is the Psoriasis Area and Severity Index (PASI). In clinical trials, a meaningful measure of successful psoriasis treatment has historically been PASI 75, which is a 75% skin improvement from the initial PASI score.^{8,9,10} PASI 90 refers to “clear or almost clear skin” and is shorthand for a 90% improvement in PASI score. PASI 100 refers to completely clear skin.^{9,10}

Another tool is the static Physician's Global Assessment (sPGA). sPGA is used as co-primary endpoint for clinical trials, since it is requested by some health authorities, e.g. the U.S. Food and Drug Administration.

Continued Need for Research in Psoriasis

Mild disease can often be managed with topical treatments, whereas people with moderate-to-severe **plaque** psoriasis may need biologic treatment.¹¹ Biologics are different from traditional systemic drugs that impact the entire immune system. Biologics, instead, target specific parts of the immune system that are associated with inflammation.

Surveys have found that about 50% of patients are dissatisfied with their current treatment and 32% of patients report that their treatment is not effective enough.^{12,15,16,17} For many patients, existing treatments are either: not appropriate, ineffective or inaccessible due to cost and insurance.¹⁴ Treatments can even stop working over time, and it's common for people with moderate-to-severe psoriasis to cycle through several approaches.

As new treatment approaches are being investigated, scientists and clinicians are setting higher treatment goals, such as PASI 90, to establish a standard of care that demonstrates clearer skin. Learn more at the [National Psoriasis Foundation](#) website.

Boehringer Ingelheim has a robust Immunology research and clinical program development, covering a wide range of immune diseases, including psoriasis, psoriatic arthritis, Crohn's disease and lupus nephritis. Boehringer Ingelheim has a vision to transform the treatment of immune diseases and the lives of patients, supporting the families and physicians that care for them.

References:

1. About Psoriasis. National Psoriasis Foundation website. <http://www.psoriasis.org/about-psoriasis>. Accessed on February 26, 2015.
2. Diseases and Conditions Psoriasis. Mayo Clinic website. <http://www.mayoclinic.org/diseases-conditions/psoriasis/basics/definition/con-20030838>. Accessed February 27, 2015.
3. Davidovici BB, Sattar N, Jörg PC, et al. Psoriasis and Systemic Inflammatory Diseases: Potential Mechanistic Links between Skin Disease and Co-Morbid Conditions. *Journal of investigative dermatology*. 2010; 130, 1785-1796. doi: 10.1038/jid.2010.103
4. Statistics. National Psoriasis Foundation website. <http://www.psoriasis.org/research/science-of-psoriasis/statistics>. Accessed on February 26, 2015.
5. Types of Psoriasis. National Psoriasis Foundation website. <http://www.psoriasis.org/about-psoriasis/types>. Accessed on February 26, 2015.
6. Psoriasis: Who gets and causes. American Academy of Dermatology website. <https://www.aad.org/dermatology-a-to-z/diseases-and-treatments/m--p/psoriasis/who-gets-causes>. Accessed on March 4, 2015.
7. Herrier RN. Advances in the treatment of moderate-to-severe plaque psoriasis. *Am J Health Syst Pharm*. 2011 May; 68(9):795-806. doi: 10.2146/ajhp100227.
8. An overview of Psoriasis and Psoriatic Arthritis. National Psoriasis Foundation website. <http://www.psoriasis.org/document.doc?id=215>. Accessed on February 26, 2015.
9. Psoriasis Area & Severity Index. The Psoriasis and Psoriatic Arthritis Alliance website. <http://www.papaa.org/articles/psoriasis-area-severity-index>. Accessed on February 26, 2015.
10. Feldman SR, Krueger GG. Psoriasis assessment tools in clinical trials. *Ann Rheum Dis*. 2005; 64:ii65-ii68. doi:10.1136/ard.2004.031237
11. Psoriasis Treatments. National Psoriasis Foundation website. <http://www.psoriasis.org/about-psoriasis/treatments>. Accessed on February 26, 2015.
12. Krueger G, Koo J, Lebwohl M, Menter A, Stern RS, Rolstad T. The impact of psoriasis on quality of life: results of a 1998 National Psoriasis Foundation patient-membership survey. *Arch Dermatol*. 2001;137(3):280-284.
13. Facts about psoriasis. National Psoriasis Foundation website. <http://www.psoriasis.org/document.doc?id=191>. Accessed on February 26, 2015.
14. Psoriasis and Mental Health Issue Brief. National Psoriasis Foundation website. <http://www.psoriasis.org/document.doc?id=350>. Accessed on February 26, 2015.
15. Armstrong AW, Robertson AD, Wu J, Schupp C, Lebwohl MG. Undertreatment, treatment trends, and treatment dissatisfaction among patients with psoriasis and psoriatic arthritis in the United States: findings from the National Psoriasis Foundation surveys, 2003-2011. *JAMA Dermatol*. 2013 Oct; 149(10):1180-5. doi: 10.1001/jamadermatol.2013.5264.
16. Christophers E, Griffiths CE, Gaitanis G, van de Kerkhof P. The unmet treatment need for moderate to severe psoriasis: results of a survey and chart review. *J Eur Acad Dermatol Venereol*. 2006 Sep; 20(8):921-5.
17. Dubertret L, Mrowietz U, Ranki A, et al. European patient perspectives on the impact of psoriasis: the EUROPSO patient membership survey. *British Journal of Dermatol*. 2006;155:729-736. doi: 10.1111/j.1365-2133.2006.07405.x.