

Image and Performance Enhancing Drugs

Glasgow
22nd March 2017

**The range of IPEDs, user populations and
motivations for use**

Jim McVeigh

Director

Public Health Institute

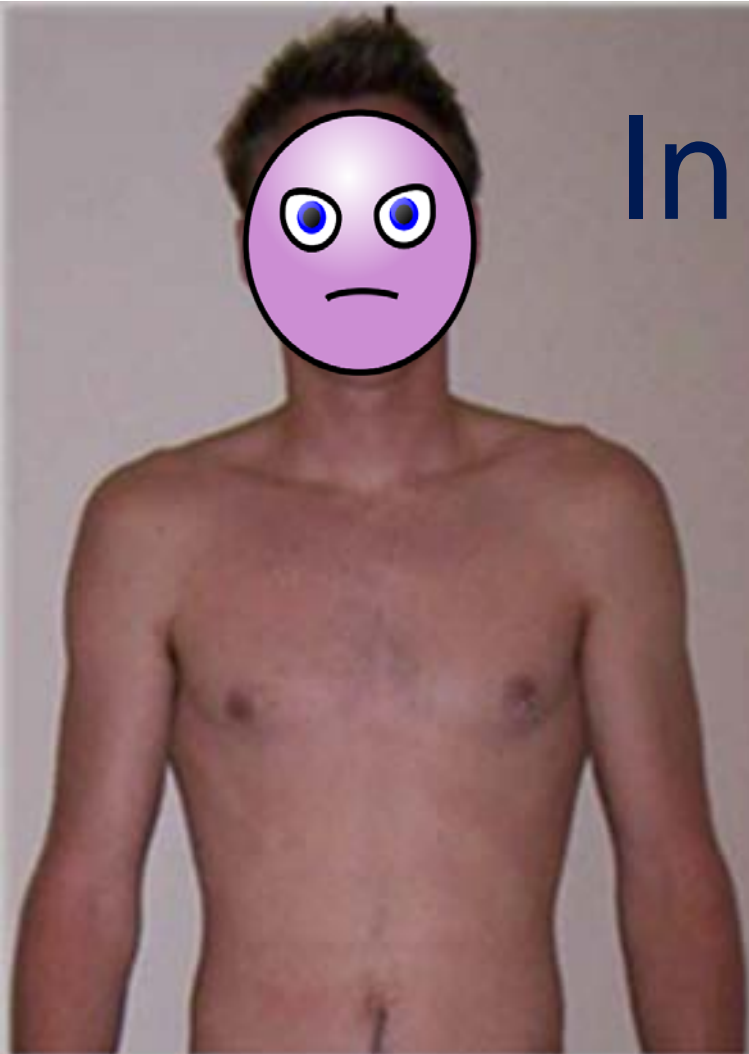




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In reality...



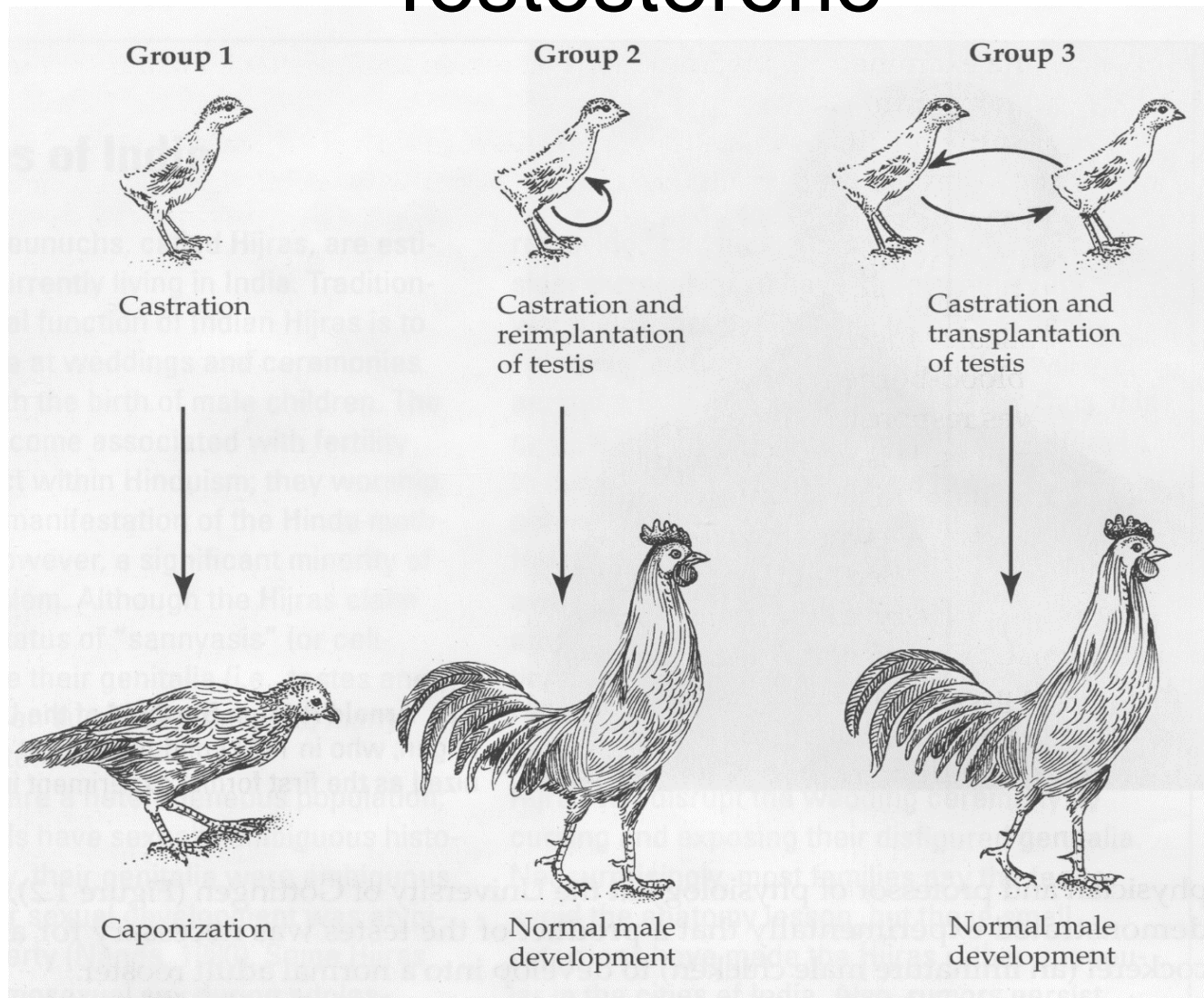
158 lbs



175 lbs

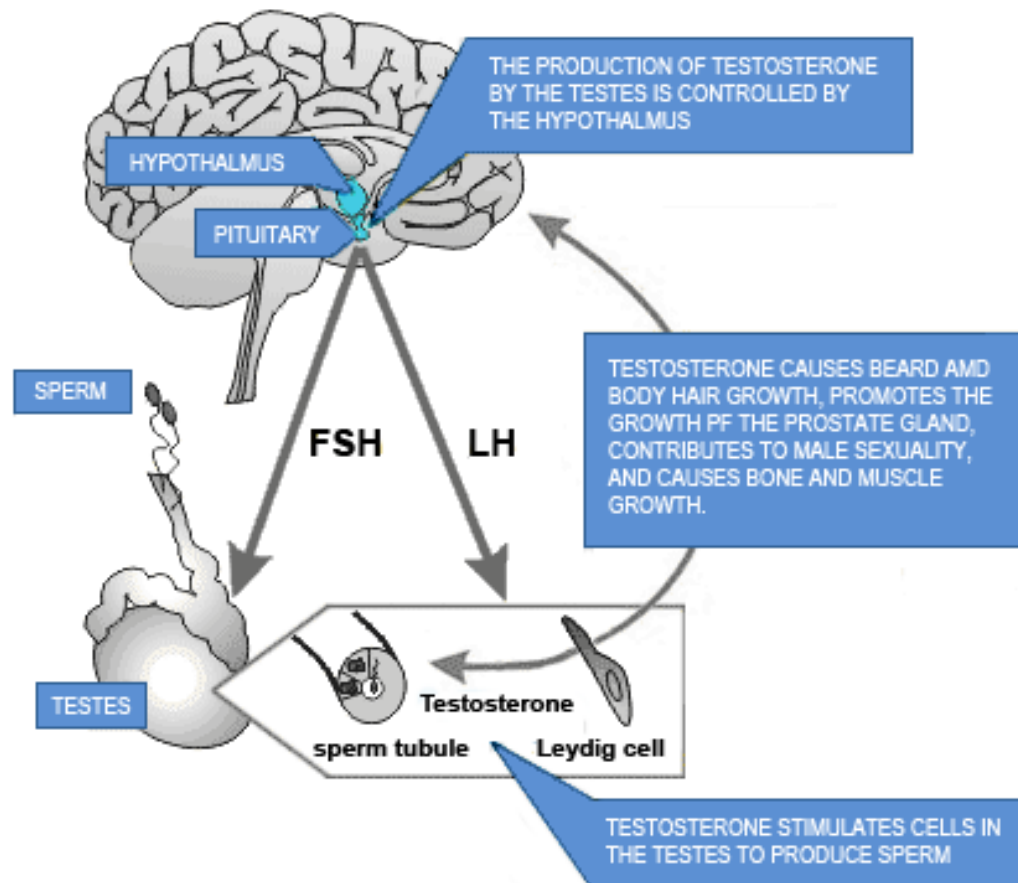
The Drugs – anabolic steroids

Testosterone

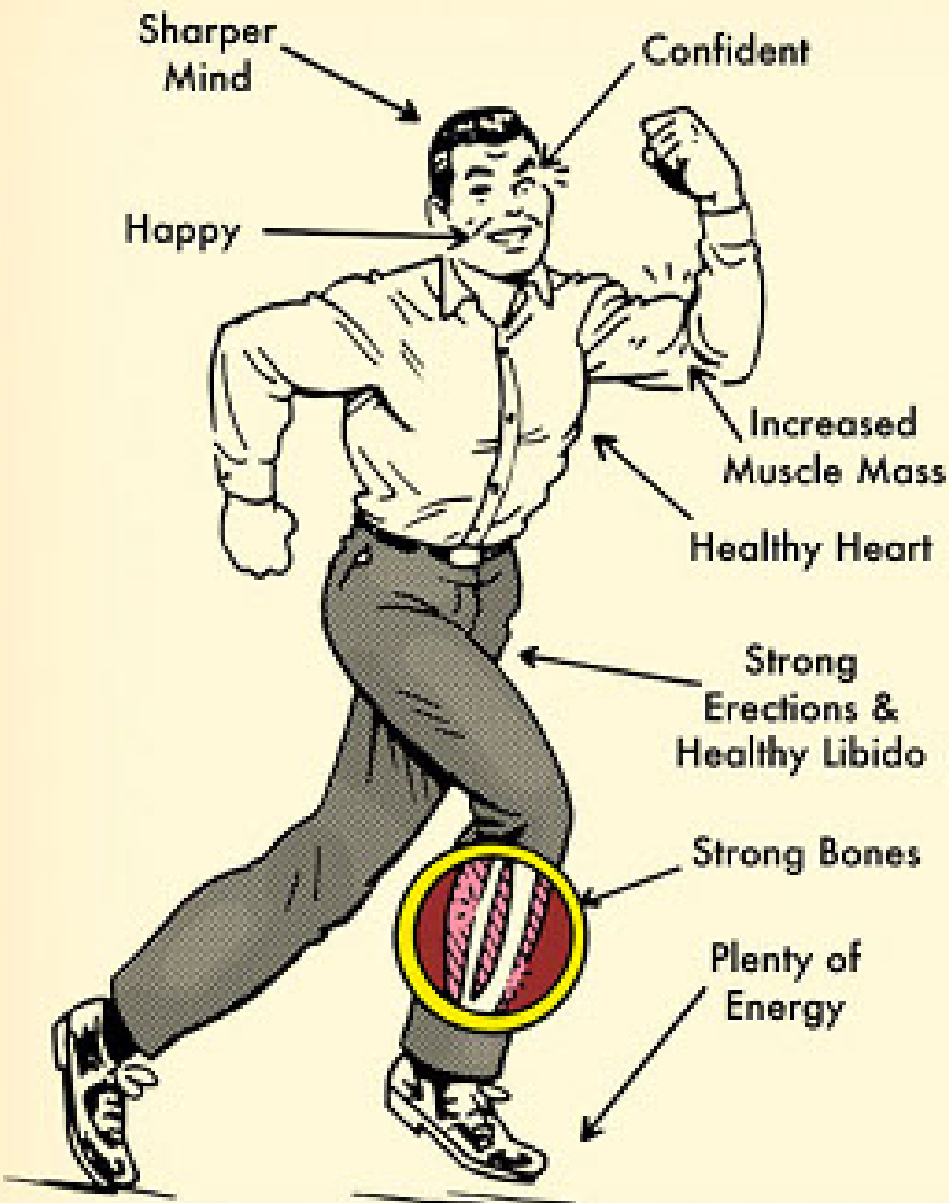


Berthold 1849

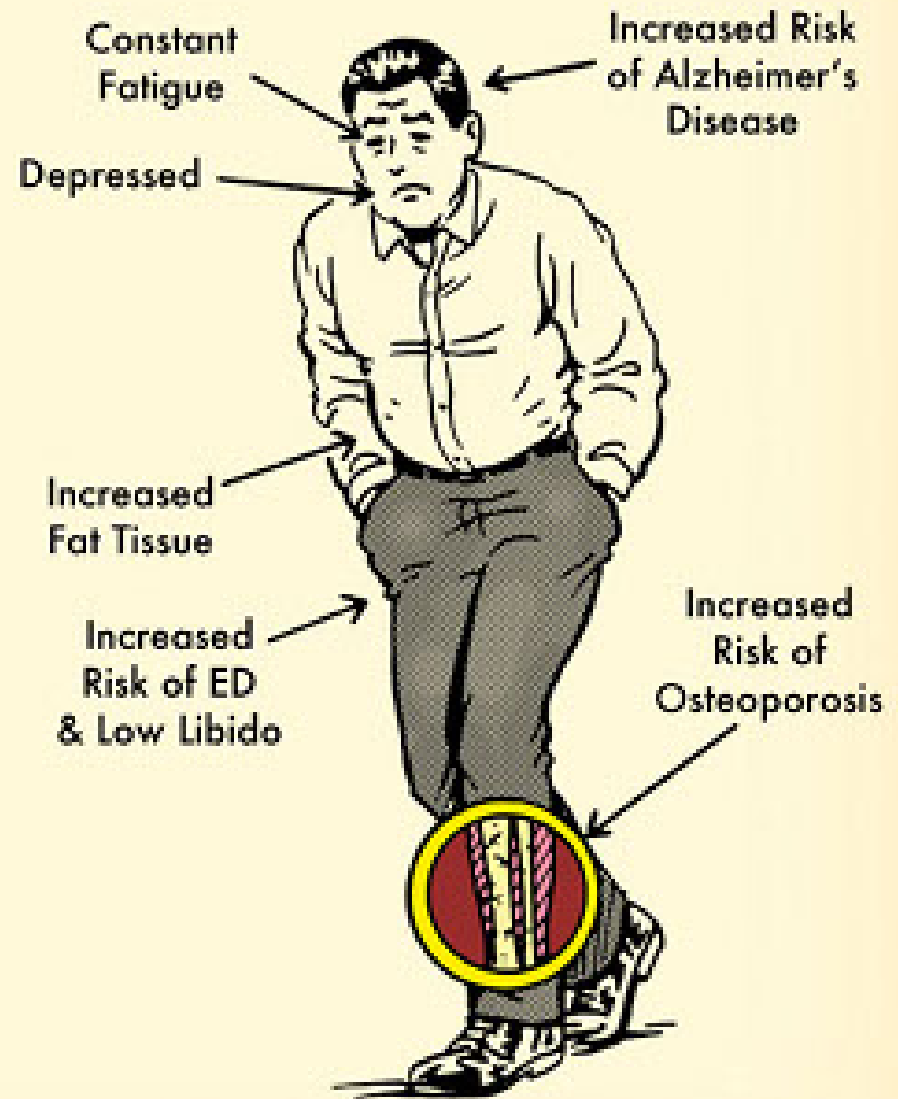
Testosterone production



The Benefits of Optimal Testosterone



Man with Optimal Testosterone



Man with Deficient Testosterone

Definition of anabolic steroids

Mimic the effects of testosterone

Testosterone - anabolic & androgenic

Anabolic - growth & development of tissue

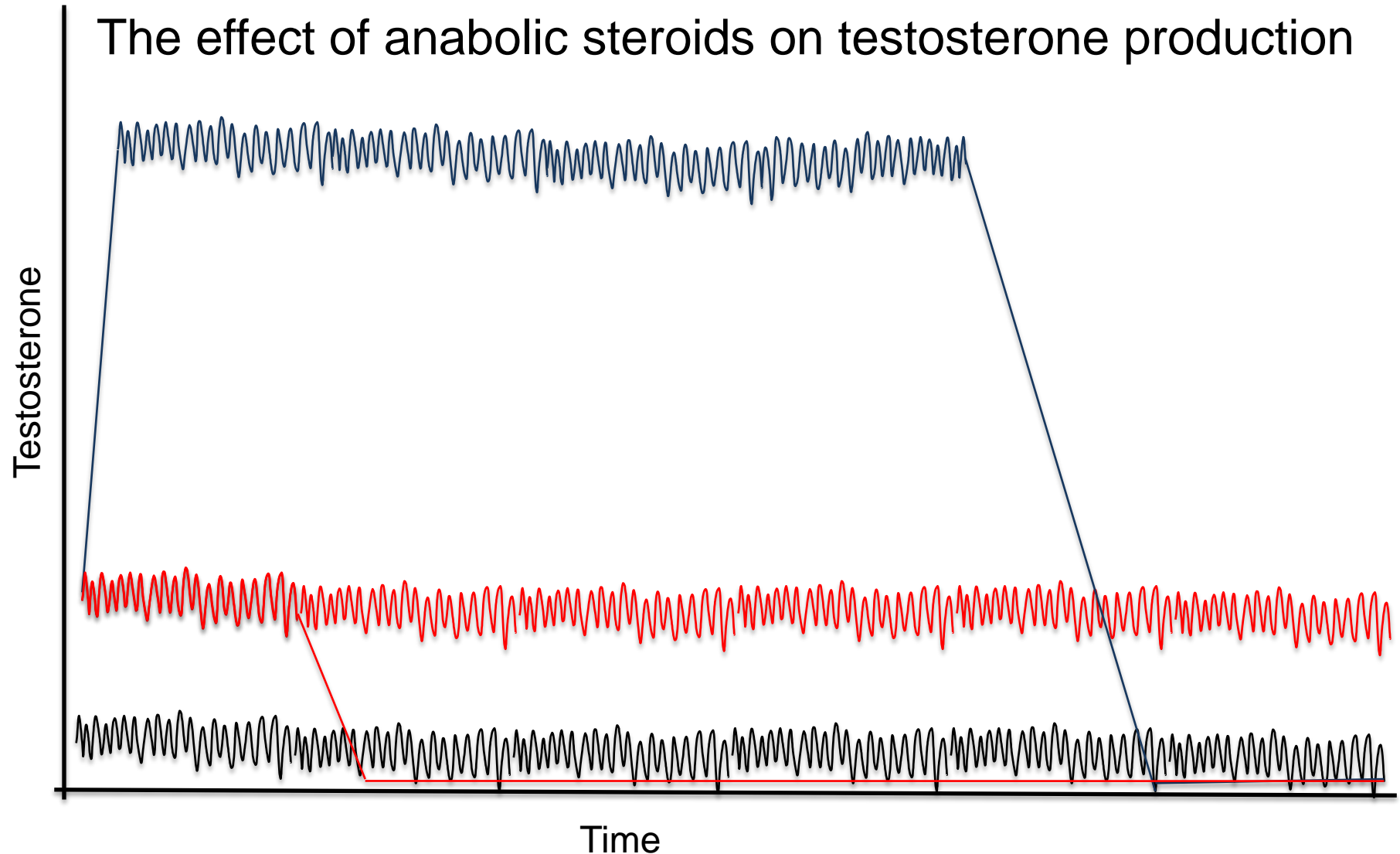
Androgenic - secondary male sexual characteristics

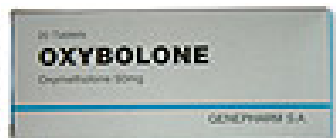
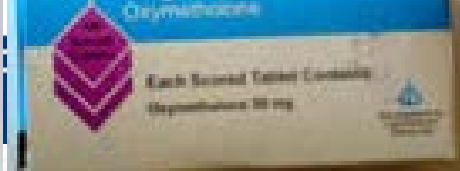
Not to be confused with corticosteroids

Clinical uses

- Aplastic anaemias
- Muscle wasting
 - Trauma/burns
 - HIV/AIDS
- Post menopausal osteoporosis
- HRT for men
- Delayed male puberty
- Male contraceptive
- Rarely indicated or used

The effect of anabolic steroids on testosterone production





Use of drugs by male anabolic steroid injectors

Image and performance enhancing drug use, last year

Years since first used an image and performance enhancing drug	0-4	36%	141
	5+	32%	128
	Median (IQR)	4 (8)	
	Not reported	32%	126
Oral anabolic steroids		57%	226
★ Oral anti-oestrogens		23%	92
Oral clenbuterol		15%	60
Oral ephedrine		20%	78
Oral thyroid hormones		9%	37
Oral phosphodiesterase type 5 inhibitor (PDE5i; "Viagra/Calias")		6.6%	26
Oral other image and performance enhancing drug (inc. Diuretics, 2,4-dinitrophenol and Pro/designer)		12%	46
Injected anabolic steroids		86%	340
★ Injected growth hormone		32%	128
Injected human chorionic gonadotropin (hCG)		16%	62
Injected insulin injected		5.6%	22
Injected melanotan		8.6%	34
Injected other image and performance enhancing drug (inc. ethryopoetin, insulin-like growth factor 1 and nalbuphine hydrochloride)		5.1%	20
<i>Use of other illicit drugs</i>			
Ever injected illicit drug other than an image and performance enhancing drug.		4.8%	19
★ Snorted cocaine in the last year		46%	181
Snorted, drunk or swallowed amphetamine in last year		12%	47

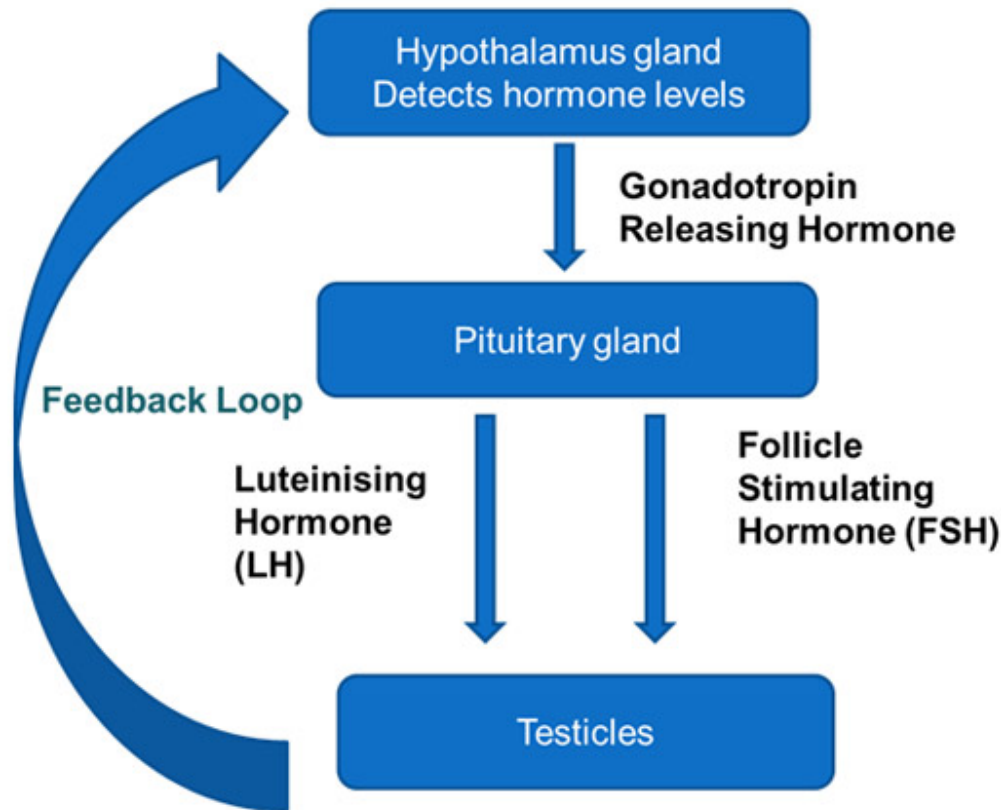
(Hope et al. 2013)

The growth of growth hormone

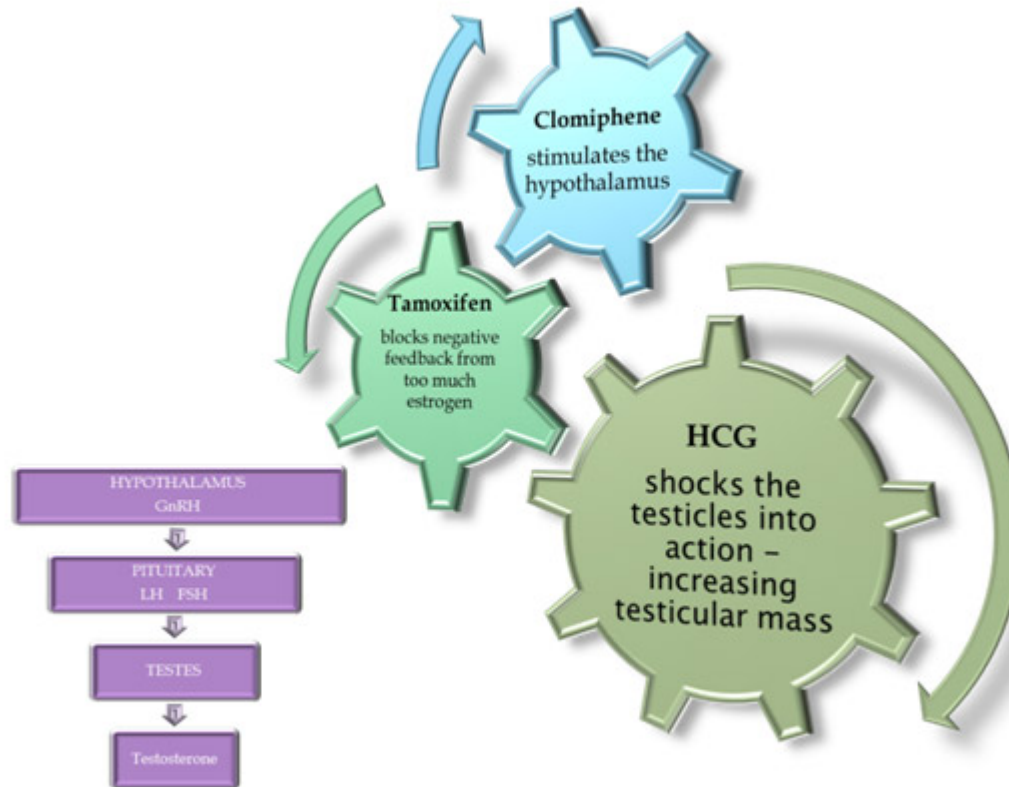
Author/ year Published	Sample	Growth hormone use
Korkia & Stimson Great Britain (1993)	110 anabolic steroid user interviews	2.7% (3/110) of those currently reporting anabolic steroid use also reported use of growth hormone in the past 6 months. Users were all male.
Lenehan et al. North West (1996)	386 interviews	5.7% (22/386) reported use of growth hormone in the past 6 months.
McVeigh et al Merseyside (2007)	85 anabolic steroid users interviews	21.2% reported use of growth hormone in the last 12 months
McVeigh et al Liverpool (2008)	27 anabolic steroid users at NSPs and Snowball sampling	29.6% reported lifetime use of growth hormone, with 11.1% reporting current use.
Hope et al England & Wales (2013)	395 IPED users at 19 NSPs	32% injected growth hormone in previous year

Post Cycle Therapy (PCT)

Post Cycle Therapy



Post Cycle Therapy



New, Emerging and Re-emerging Substances

Pegylated Mecano Growth Factor
A long acting MGF similar to IGF-1



Growth Differentiation Factor 8
a myostatin inhibitor.

FST
Possibly Follistatin –myostatin antagonist

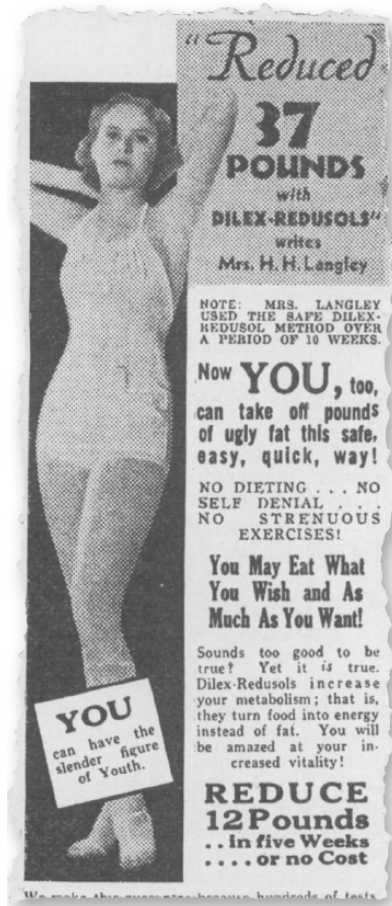
Sermorelin (GHRH 1-29)
Stimulates growth hormone release



Weight loss drugs



Dinitrophenol (DNP)



Advert for Dilux-Redusols
containing dinitrophenol, 1936.

'No dieting... No self-denial... No strenuous exercises... You can have the slender figure of Youth'.

'Literally burns the fat away'.

'Sounds too good to be true? Yet it is true'

Unpredictable responses & narrow therapeutic window

In just 2 years, 160 reported cases of cataracts and at least 10 deaths

Metabolic poison

Dinitrophenol (DNP)



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20 October 2012 Last updated at 19:34

Sean Cleathero dies after taking 'gym drug'

The family of a man who died after taking a drug used by bodybuilders have spoken of their loss of a "fun, loving and caring" man.

Sean Cleathero, 28, is believed to have taken the substance 2, 4-Dinitrophenol, (DNP) which he got from a gym, according to police.

The father-of-one was taken ill and died at hospital in High Wycombe, Buckinghamshire, on Wednesday.

The coroner has been informed and police are investigating.

His family said in a statement: "Sean was very loved and popular. His death has come as a complete shock to his family and friends."

"He was a fun, loving, caring son, grandson, brother and nephew."

"As a father he leaves behind a three-year-old daughter who will carry on his infectious personality which made him so popular to all of his friends and those who knew him."

A police spokesman said: "His death was referred to Thames Valley Police by the coroner's office on Wednesday."

Warning over DNP

"It is believed he may have taken a substance called 2, 4-Dinitrophenol, which is believed to be a performance-enhancing drug which he got from a local gym."

A post-mortem examination was inconclusive.

The spokesman said: "The investigation into the cause of death continues and further tests are required."

"Police are currently exploring any potential link between the drug and the man's death but while the investigation progresses is advising anyone who may have bought DNP tablets through unofficial sources, not to take them."

DNP is used to help burn fat but can have side effects such as extreme body temperatures leading to brain damage and blindness.

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- Steroid use 'doubling' each year
- Younger men turning to steroid use
- Warning of 'endemic' steroid use

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PRODUCT INFORMATION

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This 20mg package tan injections is a favorite for our new customers who have heard about the great results they can achieve and want to try this fantastic product for the first time. The first 10ml vial of Melanotan will take you through the LOADING PHASE and the second vial will start your MAINTENANCE PHASE which will help you keep your desired color for months.

Each 10mg vial contains 10 injections.

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(Novel) Psychoactive Substances

Gammahydroxybutyrate (GHB)

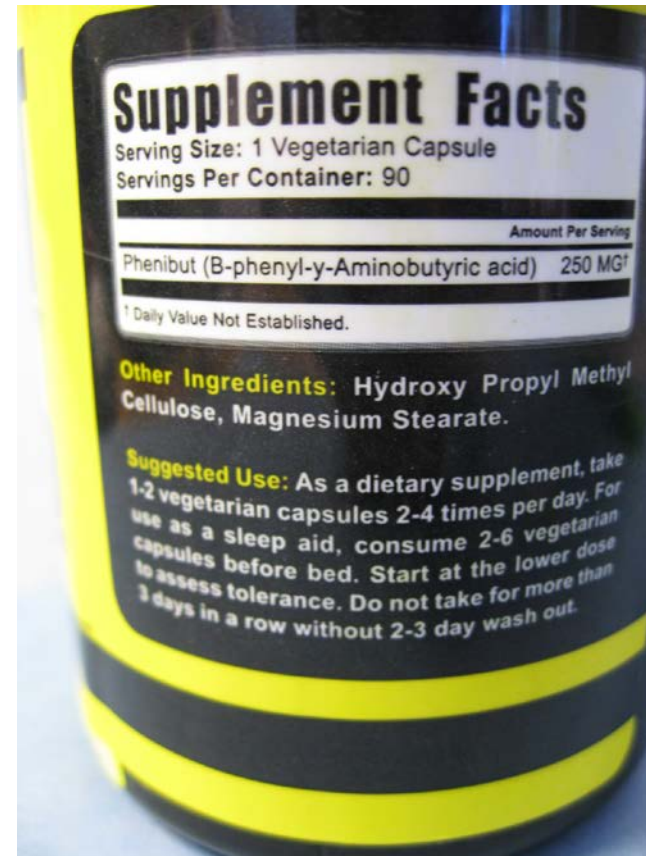
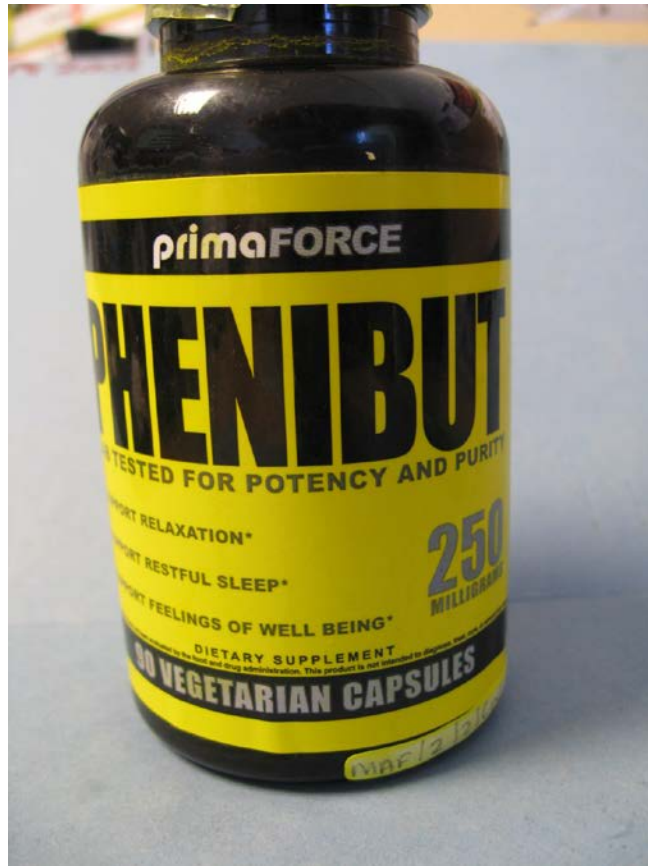
Scotland Yard probes 58 GHB-related deaths after Stephen Port killings

JUSTIN DAVENPORT CRIME EDITOR | 22 hours ago

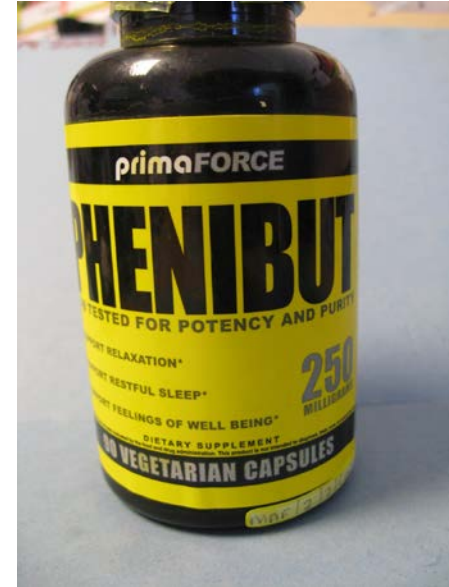
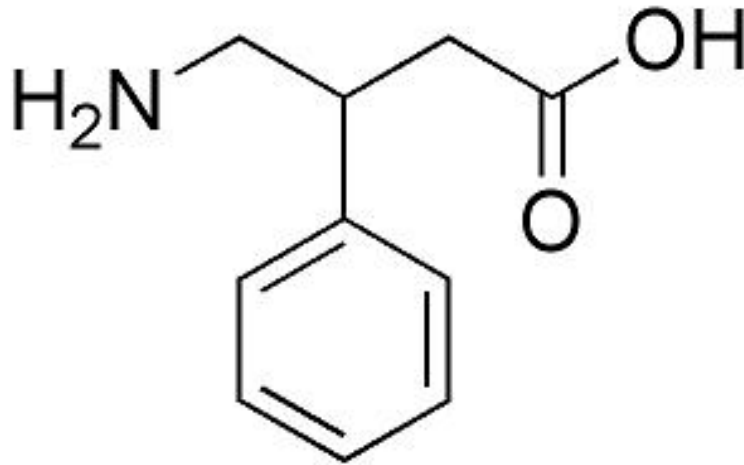




Rich Piana



Phenibut



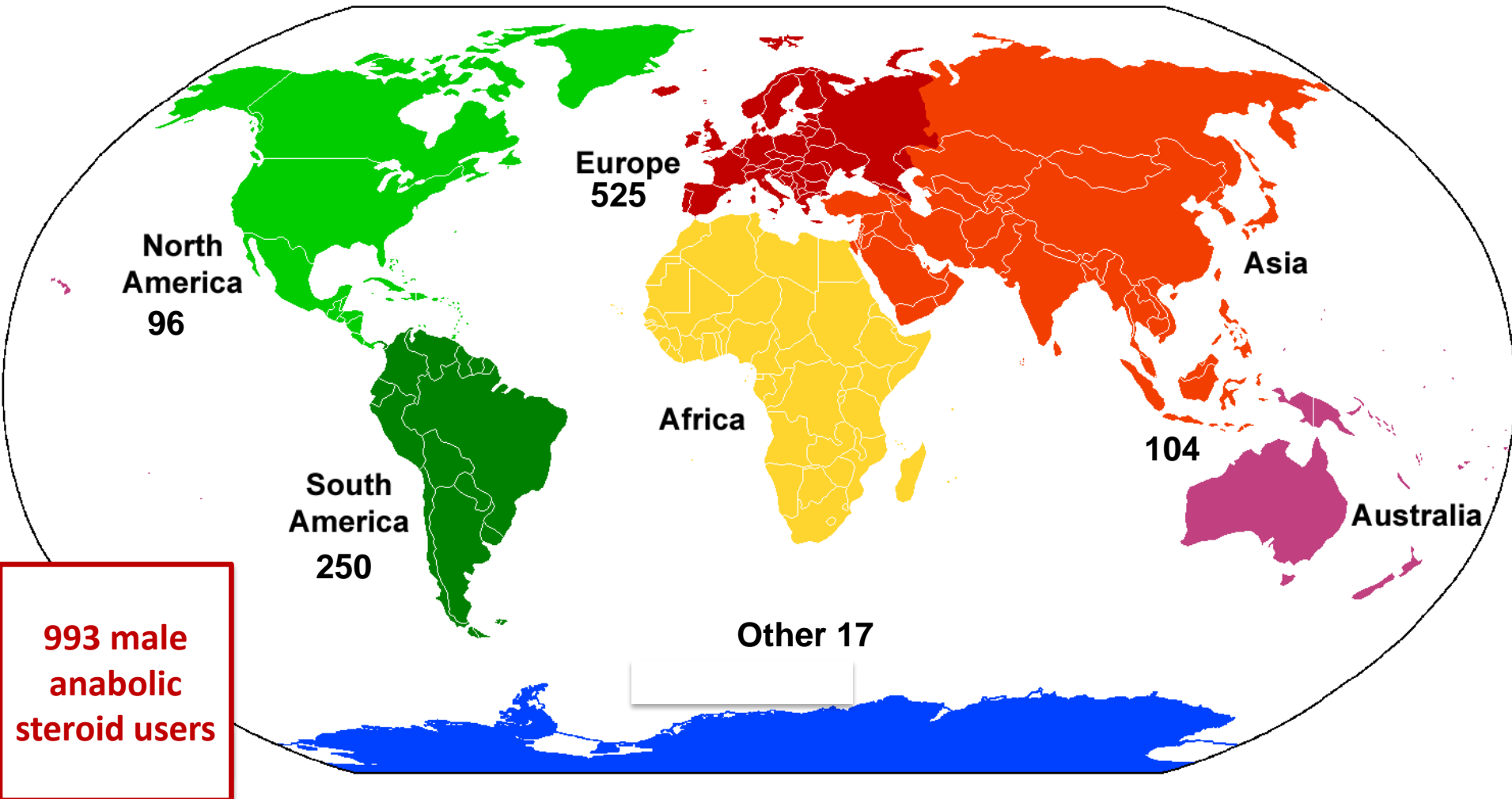
- Phenibut is a derivative of the naturally occurring inhibitory neurotransmitter γ-aminobutyric acid (GABA) - the parent structure of a phenethylamine.
- Discovered and introduced into clinical practice in Russia in the 1960s for its anxiolytic and reported nootropic (cognition enhancing) effects.
- It acts as a GABA-mimetic at GABAB and to some extent at GABAA receptors.

Reported drug use

Group	Drugs/Examples
Analgesics/anti-inflammatory drugs/opioids	Acetaminophen, aspirin, Ben-Gay, benoxaprofen, codeine, corticosteroids, heroin, hydrocodone, lidocaine, muscle oil (synthol) and muscle relaxing drugs, nalbuphine/nubain, naproxen, oxycodone, phenylbutazone, piroxicam
Anti-oestrogens	Aminogluthimide, aromatase inhibitors, clomiphene/clomid, proviron, tamoxifen
Cardiovascular drugs	Beta-2-agonists, beta-blockers, epinephrine, captopril, carvedilol, digoxin, thiazides, torsemide
Central nervous system inhibitors	Alcohol, benzodiazepines, buprenorfin, cannabinoids, hydrocodone, diazepam, gamma hydroxybutyrate (GHB), heroin, ketamine, oxycodone
Central nervous system stimulants	Amphetamine/meth, amyl nitrate, caffeine, cocaine, ephedrine, mephedrone, yohimbine
Cosmetic drugs	Anti-acne drugs, esiclene, melanotan I, suntan pills, thiomucase
Dietary/nutritional supplements	Calcium, choline and inositol
Diuretics	Furosemide, hydrochlorothiazide, spironolactone
Fat burning/weight loss drugs	2,4-dinitrophenol, anti-oestrogens, amphetamine/meth, beta blockers, bronchodilators, caffeine, chromium picolinate, clenbuterol, cocaine, conjugated linoleic acid, ephedrine, gamma hydroxybutyrate (GHB), growth hormone, hydrochlorothiazide insulin, insulin-like growth factor (IGF-1), laxatives, liothyronine, melanotan II, spironolactone, teroxin (T3), thiomucase, thyroxine, triacana, yohimbine
Muscle/strength-enhancement drugs (non-hormone)	Amphetamine/meth, anti-catabolics/glutamine, bronchodilators, chromium picolinate, clenbuterol, cocaine, creatine, ephedrine, herbal products, hydroxocobal amin (B12), melanotan II, myoblasts, muscle oil (synthol), protein powder, recovery drinks
Muscle/strength-enhancement hormones[†]	Daonil, dehydroepiandrosterone (DHEA), erythropoietin (EPO), genotropine, growth hormone, growth hormone releasing peptide, human chorionic gonadotropin (hCG), insulin-like growth factor 1 (IGF-1), insulin, levodopa, mechano growth factor, pregnyl, prohormones, proviron, somatotropine
Recreational drugs	Alcohol, cannabinoids, amphetamine/meth, caffeine, cocaine, hallucinogens, lysergic acid diethylamide (LSD), tobacco
Sexual enhancement drugs	Anti-oestrogens, human chorionic gonadotropin (hCG), melanotan II, phosphodiesterase-5 inhibitor (PDE5i), sildenafil, viagra/cialis, yohimbine

(Sagoe et al, 2015)

Global Drug Survey 2015 (89,509 responses)



Global Drug Survey – 993 steroid users

Drug	Used in last 12 months	Lifetime use
Cannabis	63.1	87.8
Other drugs *	44.6	71.4
Ecstasy	41.8	61.3
Cocaine	38.7	61.3
Amphetamines	20.6	49.1
LSD	18.1	41.1
Benzodiazepines	28.2	34.8
NPS	14.0	31.0
Opiates	15.3	30.0

* Including magic mushrooms, poppers, nitrous, ketamine and GHB

* Zahnow et al (in press)

The population(s) of users



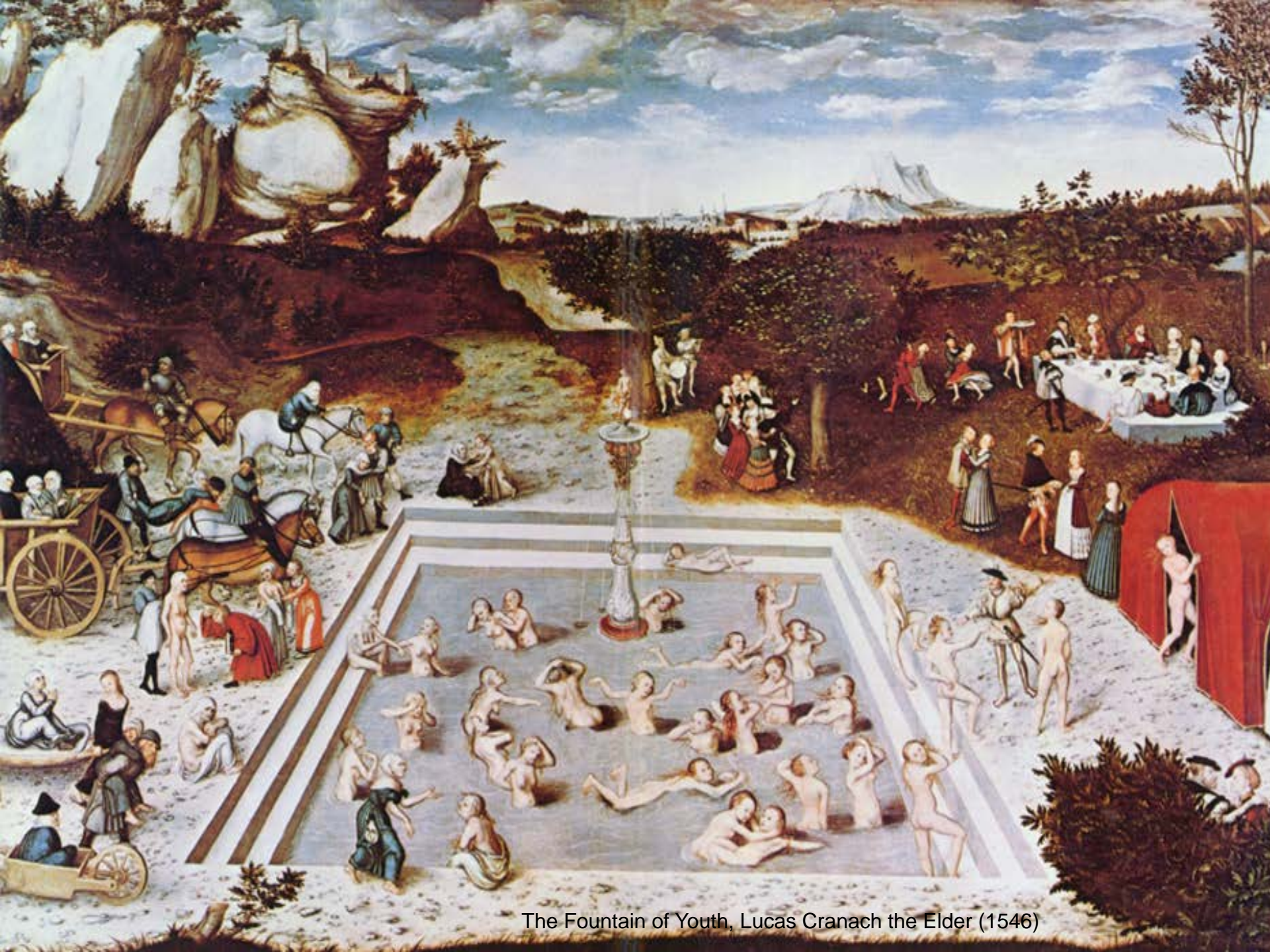


Better than well

The use of a chemical that affects the processes of the mind or body to make greater in value, beauty or effectiveness.

Historical context





The Fountain of Youth, Lucas Cranach the Elder (1546)

Marmola



'Is fatness....a social offence?'

'Every over-fat person should try it'.

'Know once again the joy of a beautiful, slender figure and make Summer days happy days'.

'When reducing, it is of paramount importance to use a scientific treatment'.

Laxatives & thyroid extract

Between 1908 and 1940 Marmola was advertised more than 200 times in the Daily Mirror

Musculature

Anabolic steroids, growth hormones

Weight loss

Rimonabant, sibutramine, DNP

Skin & hair

Mercury creams, melanotan II, Latisse

Sexual behaviour

Sildenafil, bremelanotide

Cognitive function

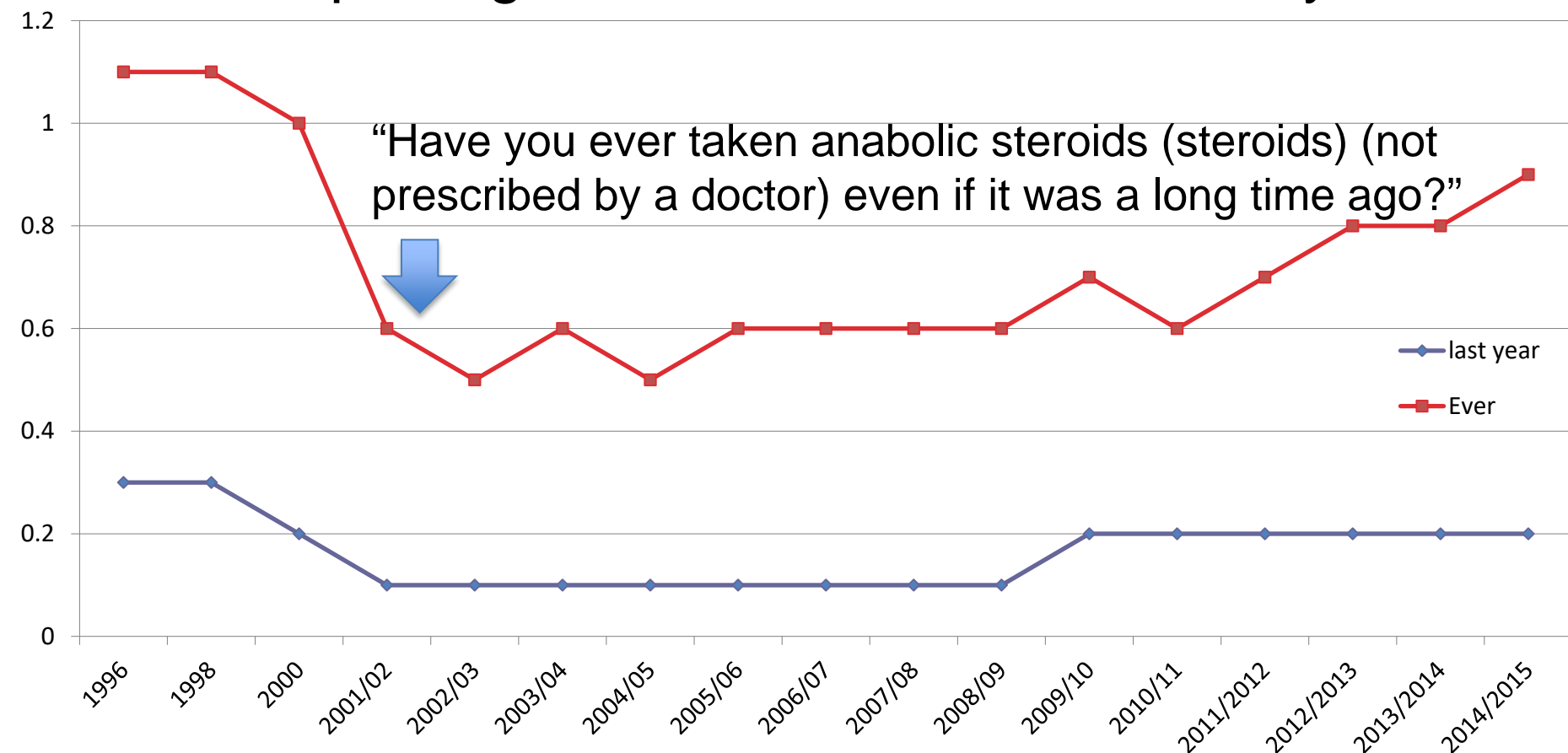
Methylphenidate and modafinil

Mood & Behaviour

SSRI, benzodiazepines Beta blockers

Prevalence of anabolic steroid use

Adults reporting anabolic steroid use in last year/ever



Drug (2014/15)	Last year	Ever
Anabolic steroids	73,000	293,000
Heroin	27,000	223,000

CSEW, 2015

Proportion of boys using drugs in the last year, 2010

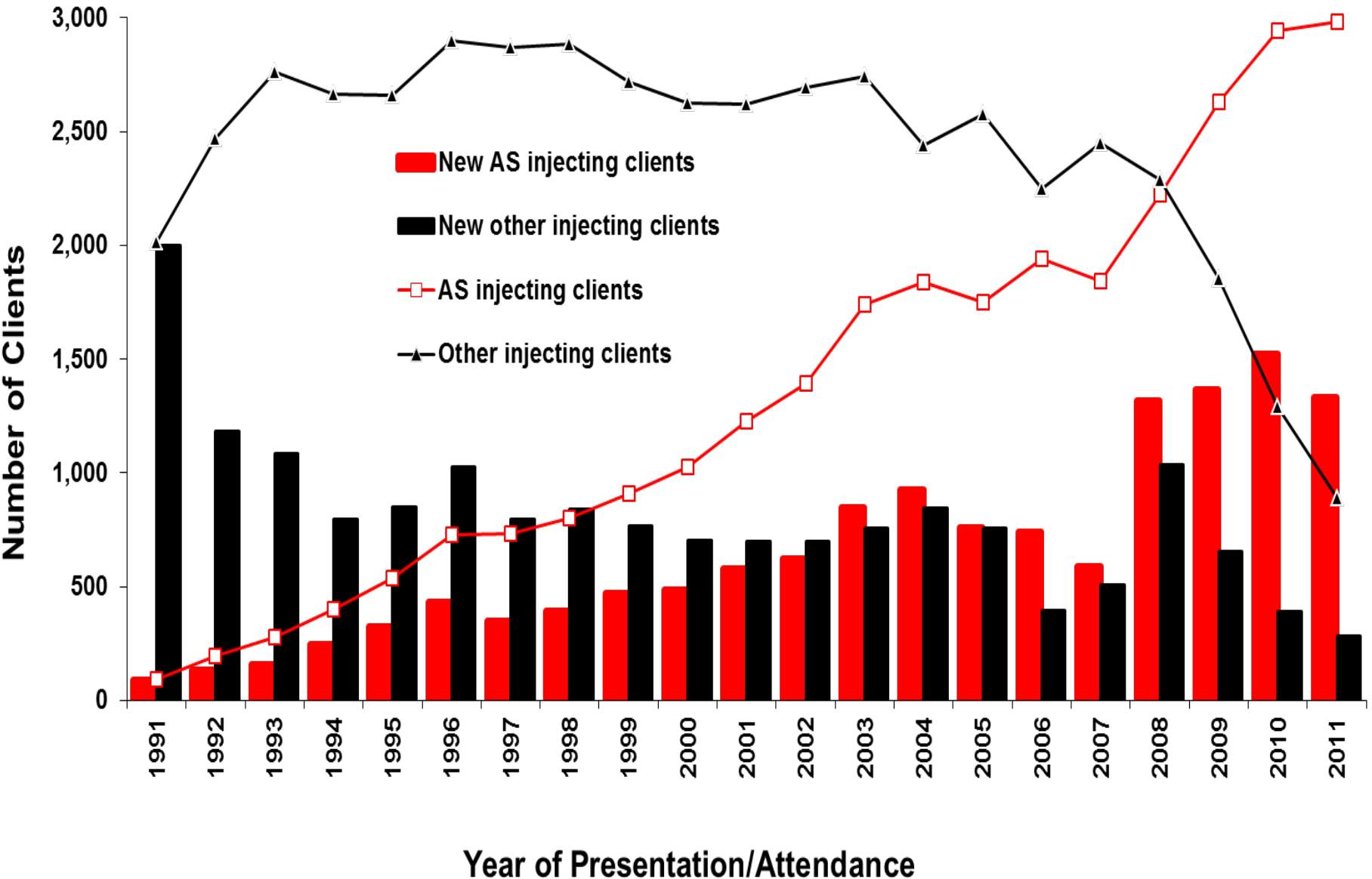
Type of drugs taken in the last year	Age					Total
	11 years	12 years	13 years	14 years	15 years	
	%	%	%	%	%	
Cannabis	0.3	0.5	5.1	10.4	22.2	8.8
Any stimulants	0.8	0.5	1.7	3.4	5.0	2.5
Cocaine	0.1	0.2	0.9	1.1	1.5	0.8
Crack	0.1	0.1	0.5	0.5	0.7	0.4
Ecstasy	0.1	0.4	0.4	0.9	1.9	0.8
Amphetamines	0.1	0.1	0.9	0.9	1.1	0.7

	11 years	12 years	13 years	14 years	15 years	Total
Anabolic steroids	0.1	0.2	0.3	0.9	0.2	0.3

Glue, gas, aerosols or solvents	2.7	3.0	2.5	4.5	9.3	3.2
Tranquillisers	0.4	0.2	0.3	0.4	0.4	0.3
Anabolic steroids	0.1	0.2	0.3	0.9	0.2	0.3
Other drugs	0.1	0.1	0.3	0.2	0.9	0.4
Any Class A drug ^b	0.1	0.5	2.2	2.7	4.9	2.3
Any drug	4.0	4.1	8.7	16.1	26.5	13.0
Any drug (excluding volatile substances)	1.4	1.3	6.5	12.8	24.7	10.6
Unweighted bases (boys) ^c	565	771	735	707	868	3646
Weighted bases (boys) ^c	551	754	716	712	926	3659

NatCen, 2012

'All' & 'new' clients attending agency based NSPs in Cheshire & Merseyside (1991 to 2011)



Proportion of NSP clients using enhancement drugs in the North of England



Middlesbrough	67%
Kirklees	60%
Sheffield	62%
Newcastle	52%
Sunderland	60%
Bradford	41%
Halton	86%
Liverpool	83%
Sefton	43%
St Helens	34%
Warrington	86%
Wirral	77%
Manchester	60%
Bolton	52%

Review article

The global epidemiology of anabolic-androgenic steroid use: a meta-analysis and meta-regression analysis

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ABSTRACT

Purpose: To estimate the global lifetime prevalence rate of anabolic-androgenic steroid (AAS) use and investigate moderators of the prevalence rate.

Methods: A meta-analysis and meta-regression analysis was performed using studies gathered from searches in PsycINFO, PubMed, ISI Web of Science, and Google Scholar among others. Included were 187 studies that provided original data on 271 lifetime prevalence rates. Studies were coded for publication year, region, sample type, age range, sample size, assessment method, and sampling method. Heterogeneity was assessed by the I^2 index and the Q -statistic. Random effect-size modeling was used. Subgroup comparisons were conducted using Bonferroni correction.

Results: The global lifetime prevalence rate obtained was 3.3% (95% confidence interval [CI], 2.8–3.8; $I^2 = 99.7$, $P < .001$). The prevalence rate for males, 6.4% (95% CI, 5.3–7.7, $I^2 = 99.2$, $P < .001$), was significantly higher ($Q_{het} = 100.1$, $P < .001$) than the rate for females, 1.6% (95% CI, 1.3–1.9, $I^2 = 96.8$, $P < .001$). Sample type (athletes), assessment method (interviews only and interviews and questionnaires), sampling method, and male sample percentage were significant predictors of AAS use prevalence. There was no indication of publication bias.

Conclusion: Nonmedical AAS use is a serious widespread public health problem.

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Introduction

Anabolic-androgenic steroids (AAS) are a group of hormones that include the natural male hormone, testosterone, together with a set of synthetic testosterone used clinically to treat several con-

sportspeople [8] and those who use AAS for either occupational or aesthetic purposes [7,9].

In the short-term, AAS use seems to have few serious medical consequences, but in the long-term, it has generally been associated with several debilitating physical and psychological symptoms and

Motivations for use

Motivations for IPED use

Motivation	Motivation n (%) n=663	Main goal n (%) n=613
To gain muscle	588 (89)	377 (62)
To get stronger	426 (64)	68 (11)
To lose fat	323 (49)	55 (9.0)
To get fitter	205 (31)	36 (5.9)
To improve endurance or stamina	144 (22)	13 (2.1)
To get faster	90 (14)	2 (0.3)
To increase sex drive	57 (8.6)	5 (0.8)
To get a tan	30 (4.5)	0
To reduce wrinkles	30 (4.5)	0
Other	-	57 (9.3)

Bates & McVeigh, 2016

Quotes

‘ ‘I feel more alive than I ever have and happier than I ever have.’

(Korkia & Stimson, 1993)

‘Steroids have allowed me to get a decent body which means more work. If there was another option which would get you the same results safely, of course I would use it.’ (Korkia & Stimson, 1993)

‘I started using [steroids] to build up my muscles and look better. In the group of lads I hang around with, the bigger you are the more respected you are and at my local gym everyone was doing it.’ (Flanagan, 2007)

It’s all about the way you look.’ (Gilliver, 2007)

“[Bodybuilding is] the purest form of sport ... no external influences or arbitrary rules, the results are purely down to myself.”

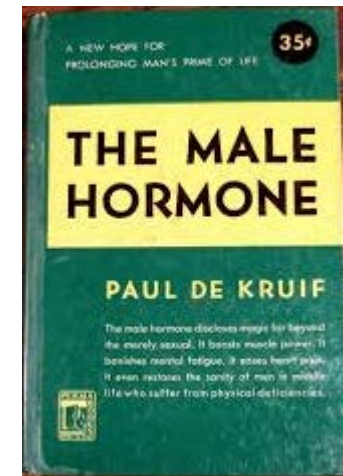
(Personal communication from steroid user, 2004)

“The day after the first subcutaneous injection, and still more after the two succeeding ones, a radical change took place in me ...
...nervous energy has been increased in every way...ability to do intellectual work has been increased in every way....”



Brown Sequard, 1889

“It’s chemical crutches. It’s borrowed manhood. Its borrowed time. But just the same, its what makes bulls bulls.”

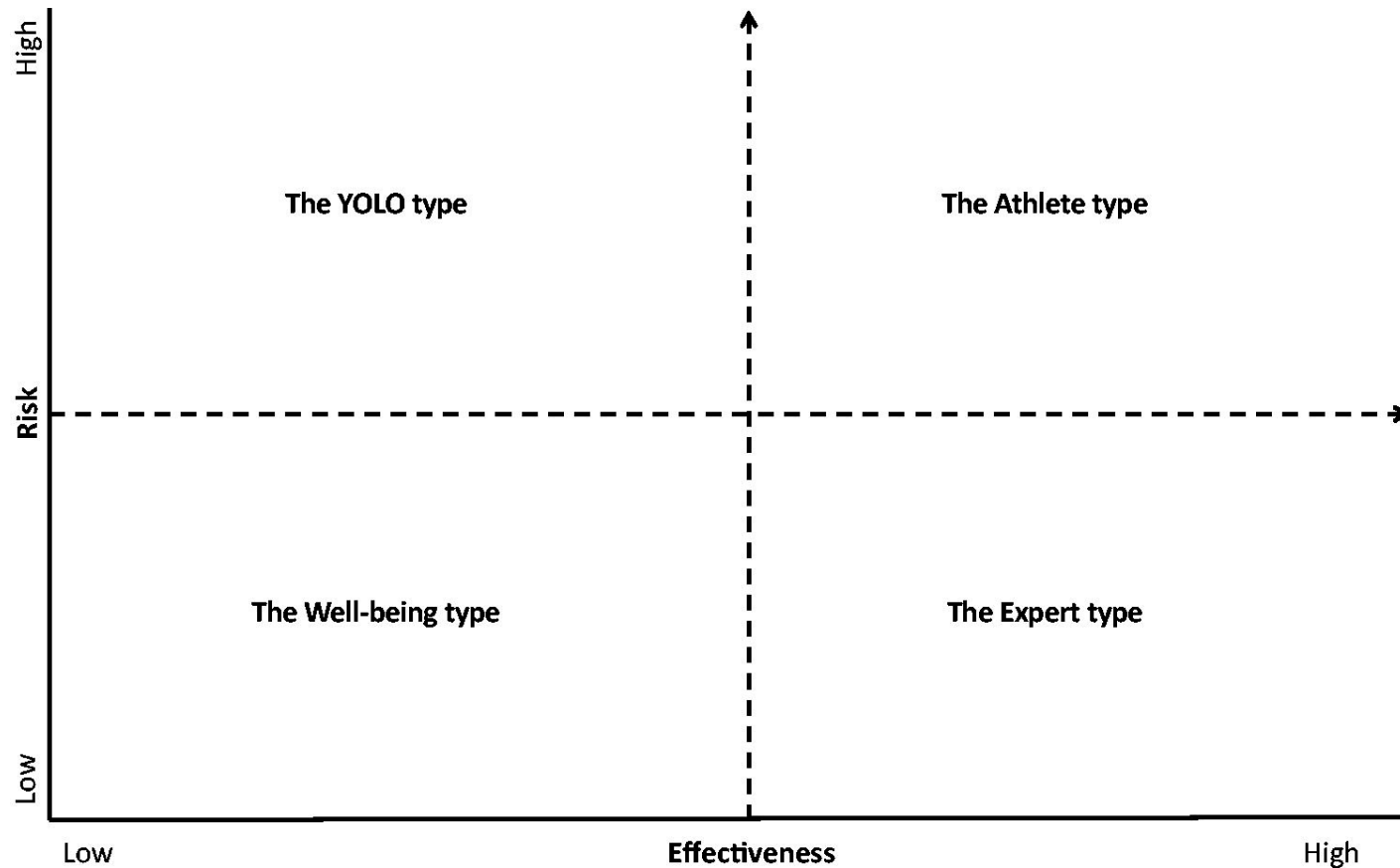


de Kruif, 1945

“It’s like you could run
through a wall, and shag
anything on the other
side”

(Kimergård, 2009)

Typology of anabolic steroid user



Christiansen et al, 2016

and finally...

Don't believe everything
you read.

AS SEEN IN
 **Men's Health** 

**"GAIN 700%
MORE MUSCLE
IN 7 WEEKS"**

 
Before After 49 Days

NOW AVAILABLE!
THE WORLD'S #1 PROVEN LEGAL
MUSCLE BUILDER...



**#1
SUPPLEMENT
IN MMA!**

Gain Weight.
Creatine and

BREAKING NEWS: September 18, 2009

Rare Plant Extract Increases Muscle Growth by 700%

Now Available Here for the First Time Without a Prescription...

Now, in just 7 short weeks, you can safely gain 700% more rock-hard muscle mass.

the subject below gained a stunning **27 pounds of lean muscle mass** and slashed his bodyfat from 23% to 5.7% within just 49 days...

2009 CIS-9-TRANS-11 FIELD STUDY RESULTS

Subject Name: David Jeffery
Hometown: Columbia Missouri

AFTER 2 WEEKS
Muscle Gained: 12.8 LB
Fat Lost: 7.1 LBS

AFTER 4 WEEKS
Muscle Gained: 18 LBS
Fat Lost: 12.2 LBS

AFTER 7 WEEKS
Muscle Gained: 27.3 LB
Fat Lost: 23.8 LBS

Source: 2009 Cis-9-Trans-11 Field Study Results, May 15-July 2, 2009, Applied Nutritional Research, LLC.

 
May 15, 2009 July 2, 2009

 
May 15, 2009 July 2, 2009

CLICK HERE

The strange case of GHRP-6



“We aim for a high standard....”



Jim McVeigh
Director

**Public Health Institute
Liverpool John Moores University**

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j.mcveigh@ljmu.ac.uk