

Evaluation of Support Programs for Young Athletes in the German Elite Sport System

Arne Güllich

- 1 Preliminary Remarks and Introduction
- 2 Ideal Type of the Support System: Analysis of Policy Concept
- 3 Methods and Empirical Results
 - .1 *Evaluation (1): Development of System Components*
 - .2 *Evaluation (2): Effects of Components of the Support System*
 - .3 *Evaluation (3): Conditions for Success at Individual Athlete Level*
- 4 Discussion, Conclusions, Implications

SUPPORT SYSTEM IN ELITE SPORT

Complex of measures designed to *FACILITATE*
a *BEHAVIOR* that *INCREASES* the long-term
SUCCESS probability in *SENIOR ELITE* sport

Which structure is most functional ?

How can the system's
efficacy be improved ?

To what extent can empirical
research contribute ?

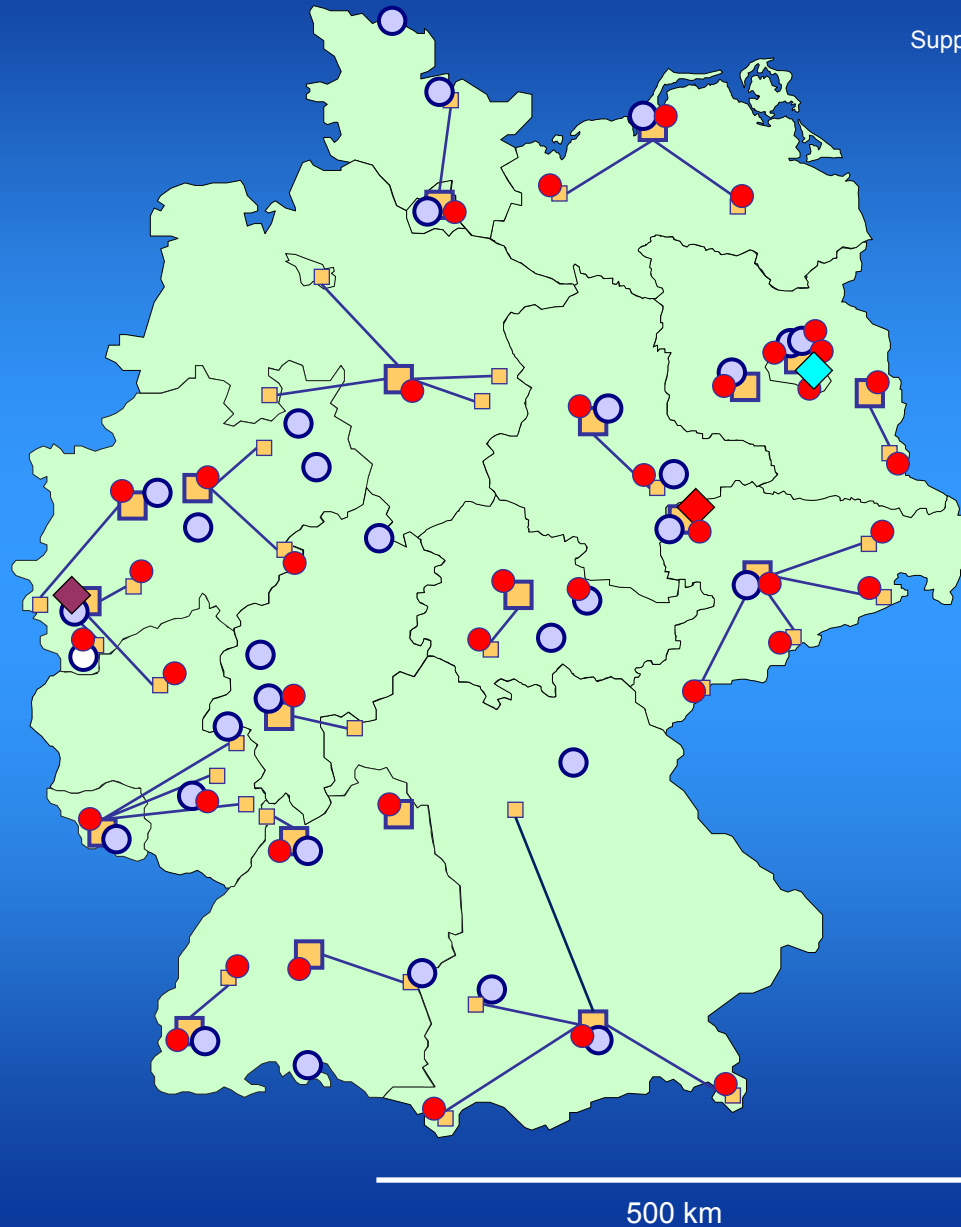
1 Introduction

GERMANY

-83 Mio inhabitants

-357,104 km²

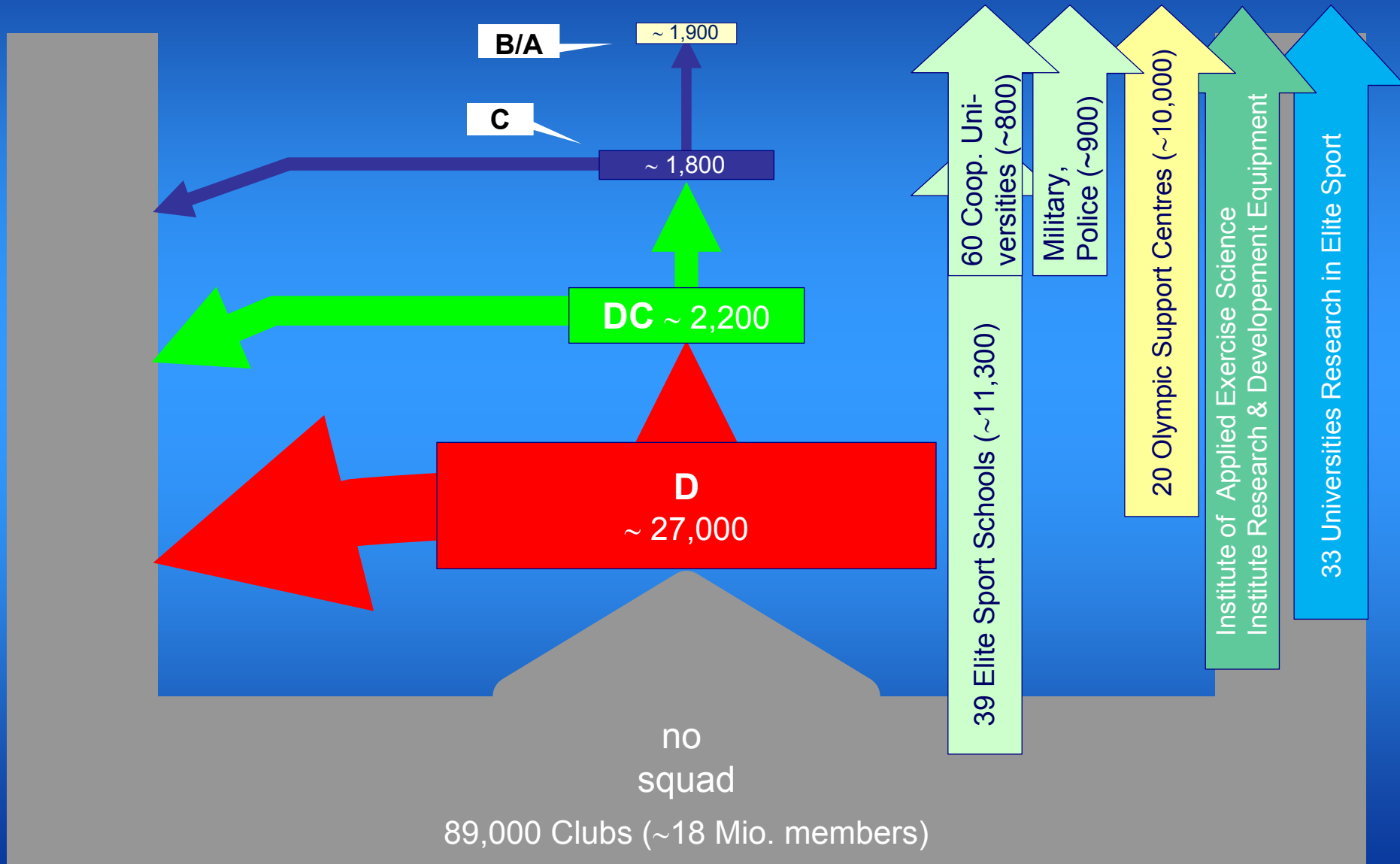
-  Olympic Support Center
-  Elite Sport School
-  Institute of Applied Training Science
-  Institute for Research and Development of Sports Equipment
-  Coaches Academy
-  University (Research)
-  Federal Institute of Sports Science



500 km

500 km

1 Introduction



“Ideal Type“ Support System

*National Concept for the Support of Young Athletes,
according NSOs' concepts (EDP-based content analysis)*

Expansion and Intensification

- Training (earlier, more)
- High profile specialist *coaching*
- Systematic training *monitoring* and *control*
- *Scientific* support
- Institutionalized *talent search* programs, coop. schools
- Federations' *squad* system
- Time management: *Elite sport schools*
- Higher degree of *centralization*

Empirical results (1): Development of System Components

Talent search programs		+ 100%	in 8 y
Youth & junior squads	“D“	+ 12%	in 8 y
	“DC“	+ 85%	in 8 y
Elite sport schools		+ 27%	in 8 y
Olympic support centers		~70% of involved athletes in youth and junior age categories	

Questions

- 1 Do **recruitment programs** exhibit persistent effects on *recruitment*?
- 2 How do athletes '*move*' through the stages of the **squad system**?
- 3 Do athletes *know* about the offered support services of the **OSC**?
How many athletes *use* these services? If not, *why* not?
How do they *perceive* the service?
- 4 How do athletes in **elite sport schools** *perceive* this support program?
Do they *train* and *compete* more?
Do they experience *less problems* in coupling school and sport?
Have they got advantages in school *marks* and *grades* and in *post-school* educational or professional career?
- 5 Which *success rates* do support programs exhibit?
To what extent are **juvenile support programs** associated with enhanced *success* in *senior* elite sport at long term?

Empirical studies: Methods

Project	Subjects, design, data collection	Variables
Literature research	<ul style="list-style-type: none"> • 447 out of ~3,800 publications 	
Sport clubs	<ul style="list-style-type: none"> • N=247 • Survey • Trans-sectional, longitudinal 3 y 	<ul style="list-style-type: none"> • Club's recruitment and support programs • Support programs of federations, OSC, elite sport schools • Success
Squad career	<ul style="list-style-type: none"> • Squad members D to A, n=4,972 • 7 olympic sports • Document analysis, longitudinal 7 y 	<ul style="list-style-type: none"> • Status squad membership and stage • Age-related cornerstones • Continuity
Athletes' survey	<ul style="list-style-type: none"> • Squad members D to A • Survey, all Olympic sports • Transsectional and retrospective: n=1,558; longitudinal 3 y: n=224 	<ul style="list-style-type: none"> • Squad career • OSC service: Information, use, intensity, reasons if not, perception • <10, 11-14, 15-18, 19-21, >21 years • Success
Elite sport schools	<ul style="list-style-type: none"> • Olympians survey n=199; document analysis n=465 • Retrospective 	<ul style="list-style-type: none"> • Membership ESS, training volume, interference, coordination • Educational "success", Olympic success

Empirical results (2)

System Components	Results	
Recruitment programs (sport clubs)	Persistent recruitment	o
Squad program (federations)	Linearity, continuity	-
Olympic Support Center (OSC)	Information	+
	Use	+
	Subjective perception	+
Elite Sport Schools (ESS)	Continuity	o
	Training volume	+
	Subjective perception	+
	Coordination interference	o -
	School grade	o
	Post-school career	-

3.2 Evaluation 1: System components

Preliminary Results (1) Support and Success

System components		Retrospective n=1,558; longitudinal 3 y, n=244				Success	
		Short-term	Mid-term	Long-term	Junior	Senior	
Sport Clubs	Support					+	
	Early start	+	o	-		-	
	Early intensity	+	o	-		o	
Squad Program	Total duration	+	-	-		o	
OSC-service	Total volume	+	-	-		o -	
Elite Sport Sch	Continuity	o	o	o		o	

I.e., most early supported athletes never become senior top athletes.

Most senior top athletes were not involved in support programs at early age.

Preliminary Summary (2): “Quality”

Normative dimension	Accordance with ideal-typically set “optimal” support system	+
Subjective dimension	Positive subjective perception of programs	+
Instrumental dimension	Extent to which support programs factually contribute to the attainment of the programs’ goal	o -



Question

Inaccurate program *implementation* ?

Or *Program* inaccuracy – inaccurate program *assumptions* ?

Or Results only *indicators* for „third *intervening variable*“ ?

Hard core of fundamental assumptions (1)

Support measures	Expected effect directionality			
	Incentives, recruitment	Buffering athlete's costs and/or risks	<i>Expansion of training time (extensive time economy)</i>	Increment of training <i>efficiency</i> (<i>intensive time economy</i>)
Participation in competitions	+	(+)		
Provision facilities and equipment			+	+
Additional training (centers, camps, ...)			+	(+)
Provision of coaches			+	(+)
(Further) education of coaches				+
Talent search, squad recruitment	+			
Medical & paramedical intervention		(+)	+	(+)
Performance & training diagn. & control				+
Management of social environment		(+)	+	
Time management in elite sport schools	+	(+)	+	(+)
Individual funding	+	+	(+)	

TIME
= Input-Resource

Empirical investigation of individual athlete level

Sports

Literature: Descriptive studies

-Training onset during *childhood / adolescence*

considerable juvenile training volume (Ericsson, Starkes, ...)

-Training in *various* sports, “*sampling years*“ (Côté, Gulbin, Oldenziel, ...)

(2)What did they have in common?

(3)To what extent did the more successful athletes differ among each other?

Support

Early start

Age-related intensity

Continuity

Empirical testing of fundamental assumptions: Methods

Project	Subjects, design, data collection	Variables
Athletes' survey	<ul style="list-style-type: none"> Squad members D to A Survey, all Olympic sports Trans-sectional and retrospective n=1,558; longitudinal 3 y n=224 	<ul style="list-style-type: none"> Success Age at career "cornerstones" Training intensity, continuity Interference factors (injury, illness, ...) <i><11, 11-14, 15-18, 19-21, >21 y</i> <i>Main sport and other sports</i>
Digital training diary	<ul style="list-style-type: none"> Squad members DC and C (Diving, Cycling, Rowing) n=230 Longitudinal 3 y 	<ul style="list-style-type: none"> Performance, success Training intensity, volume of single training activities
Worldwide Olympians	<ul style="list-style-type: none"> 6,385 Athens 2004 Olympians 	<ul style="list-style-type: none"> Age at career "cornerstones" Practice other sports

Empirical results (4): Juvenile competitive success

Success at age category	Correlation with senior success
< 11 y	- 0.11; n=447
11-14 y	- 0.10; n=421
15-18 y	0.07; n=475

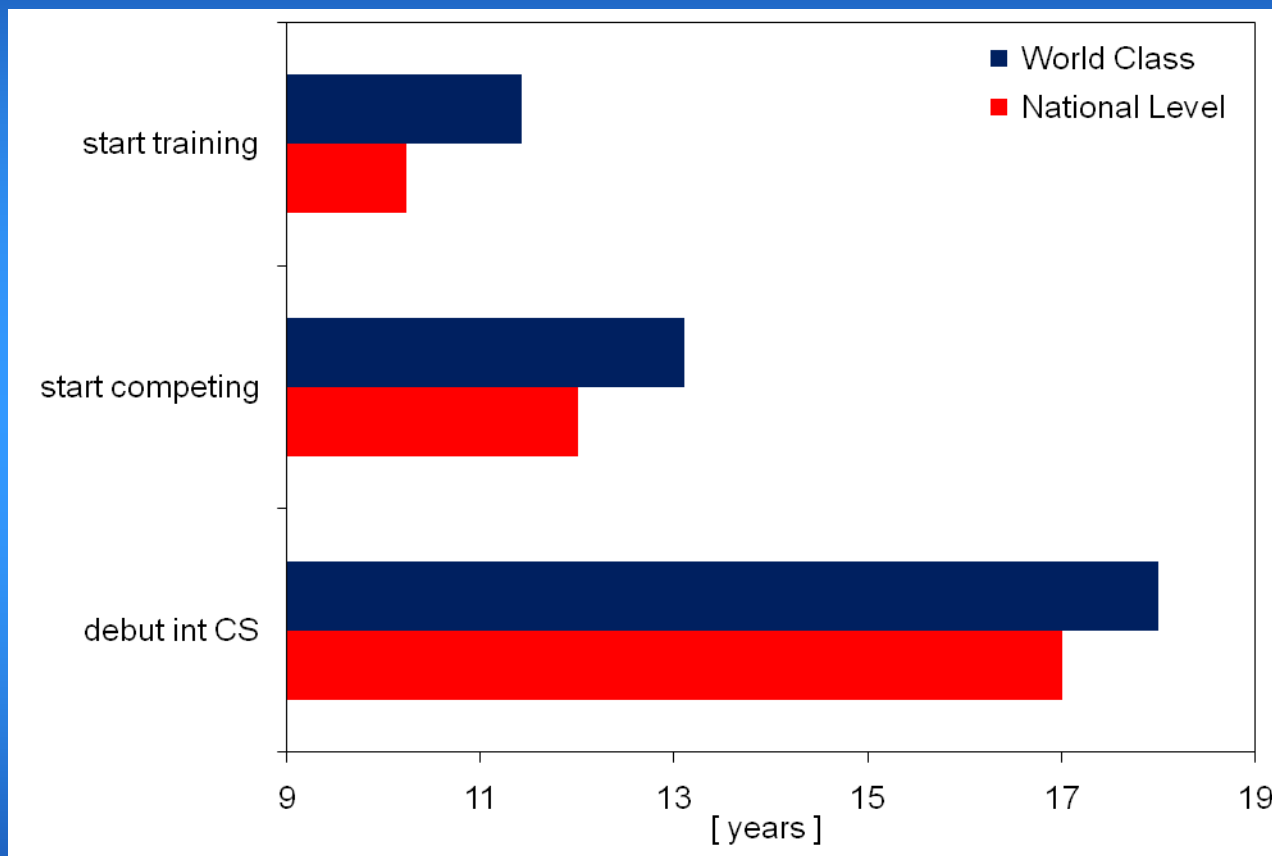
Worldwide Olympians Athens 2004

International Championship Debut

44% within youth and junior age categories (16.8 ± 2.5 y)

56% in senior age categories (22.0 ± 3.1 y)

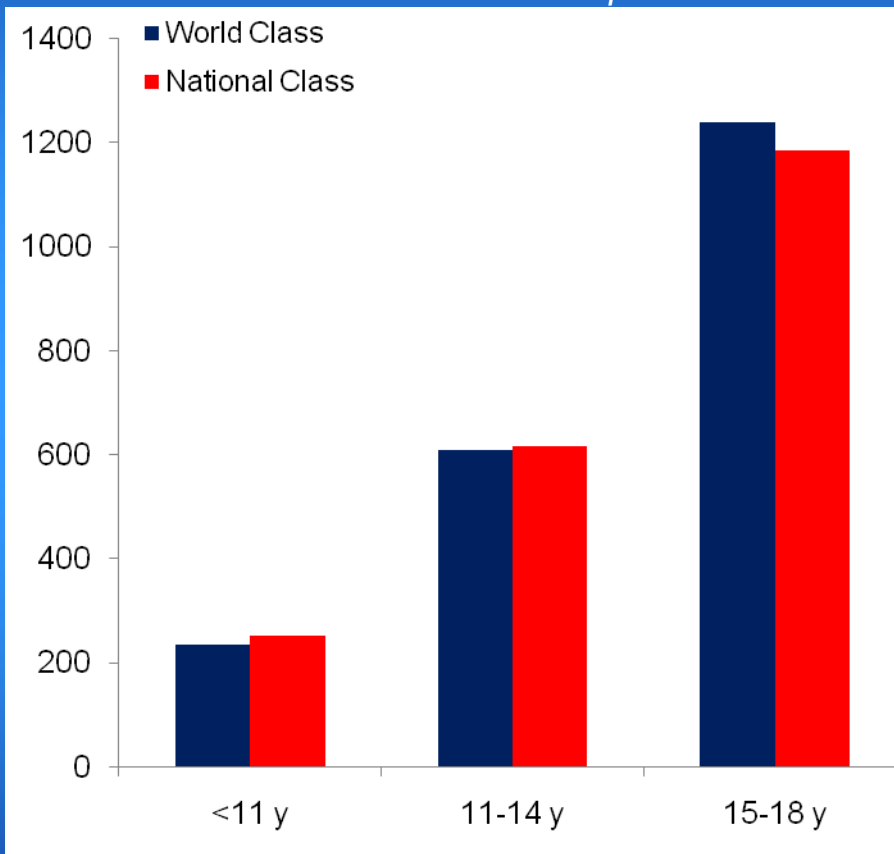
Empirical results (5): Career “cornerstones”



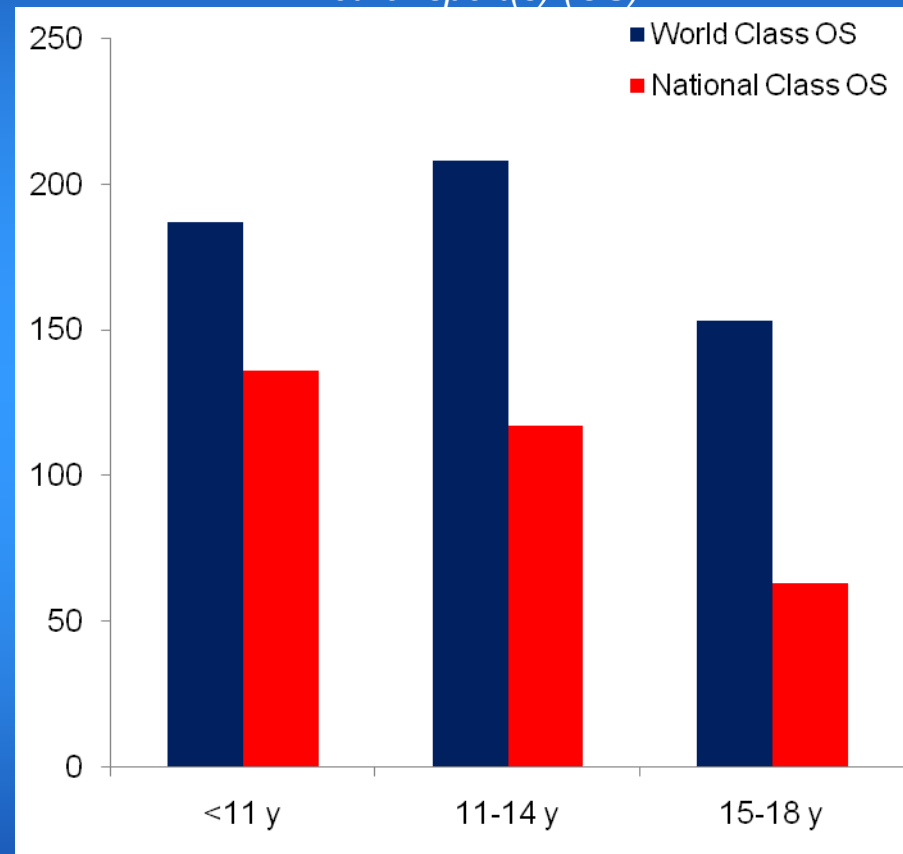
World Class = Top Ten in Olympics or Senior WCS; National level = below

Empirical results (6): Training intensity

In the current main sport



In other sport(s) (OS)



Training intensity: Number of training sessions within age category

Confirmation in longitudinal study 3 years (n=244)

Preliminary summary (3): Conditions for success

Dimension	Training & Competition								
	Support			Current main sport			Other sport(s)		
	Short	Mid	Long	Short	Mid	Long	Short	Mid	Long
Early start	+	o	-	+	o	-	-	o	+
Early intensity	+	o	-	+	o	-	-	o	+
Total duration	+	-	-	+	-	-	-	o	+
Total volume	+	-	-	+	-	o	-	o	+
Continuity	o	o	o	o	o	o	o	o	o

Unansprechbare Disziplinen

6 Evaluation research

- (1) Valuation *Inconsistency of quality dimensions*
 Subjective quality (e.g. GAP-approach) no reliable
 indicator for (development of) instrumental quality

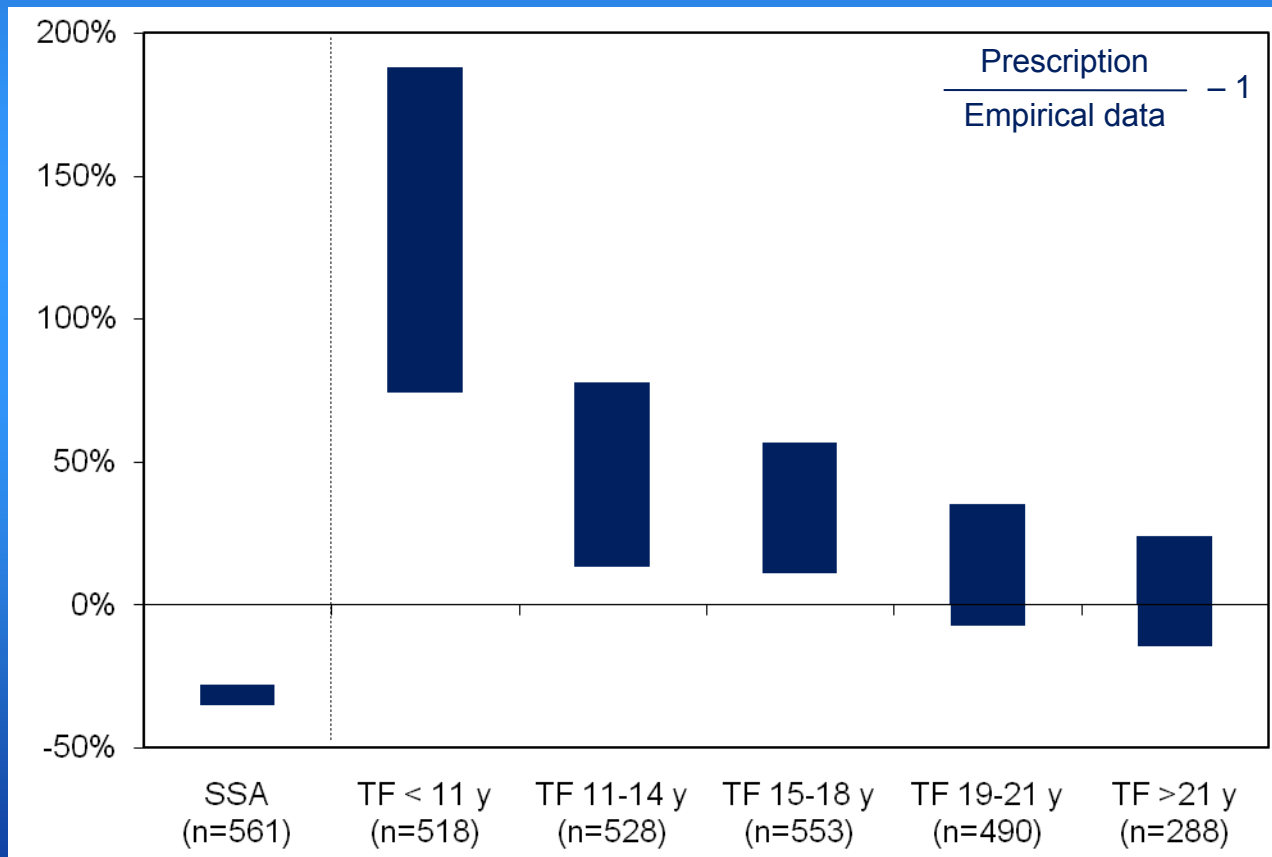
- (2) Counselling *Dysbalance: Empirically founded technological*
& Intervention *rules opposed by socially constructed and*
 normative statements
 (*=> extend scope of empirical findings*)

7 Practice

- (1) Relativization of “constitutive“ *code of victory / defeat* (system theory)
- (2) Pattern of *individual* and *collective* goal-pursuit
=> Strengthen structures beyond superior bodies' programs (e. g. clubs)
=> Shift of institutionalized programs to the right on age axis
- (3) Support mainly *self-driven* (offer vs. order)

Intended Development

Data from federations' central framework training prescription and empirical data from senior elite athletes (34 Olympic sports)

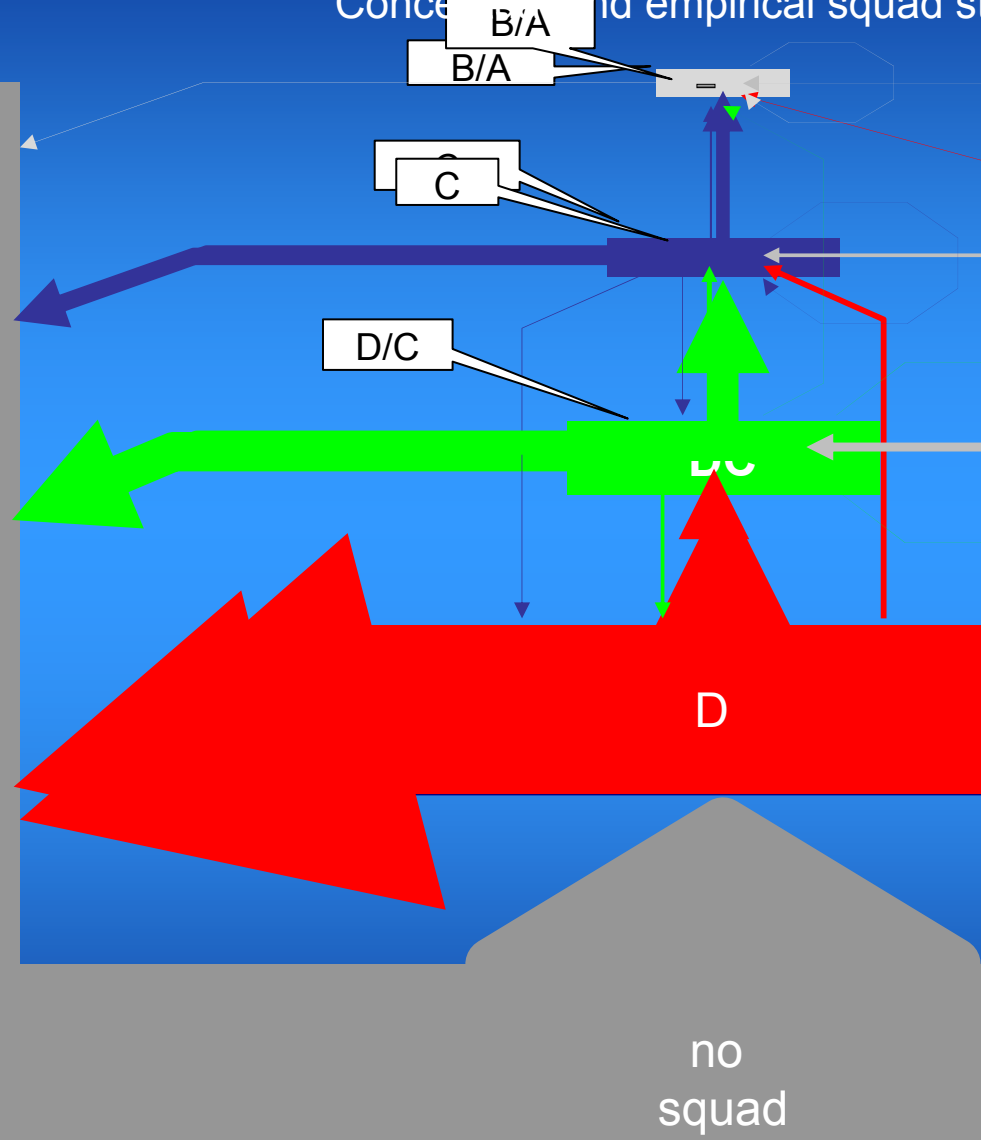


SSA = Sportspecific Starting Age; TF = Training frequency

[>> ... back](#)

3.1 Evaluation 1: System components

Conceptual and empirical squad structure

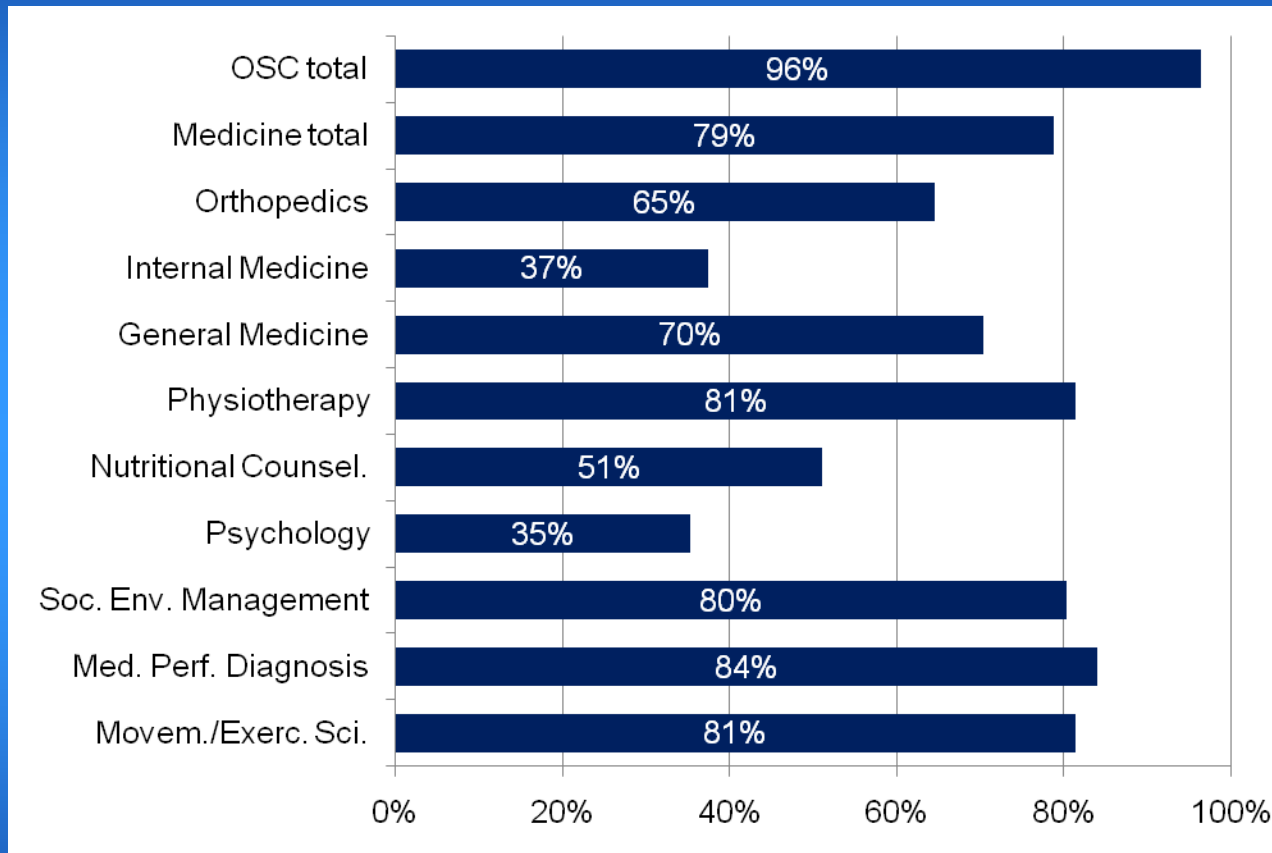


Squad career

Mean duration	1.8 ± 1.0 y
Age entry vs. exit	r=0.88
Yearly turnover	"D"
	51%
"DC"	74%
"C"	69%
Continuous career over 3 y	
"D / DC / C"	77%
"D / DC / C" => "B / A"	46%
Within "B / A"	37%

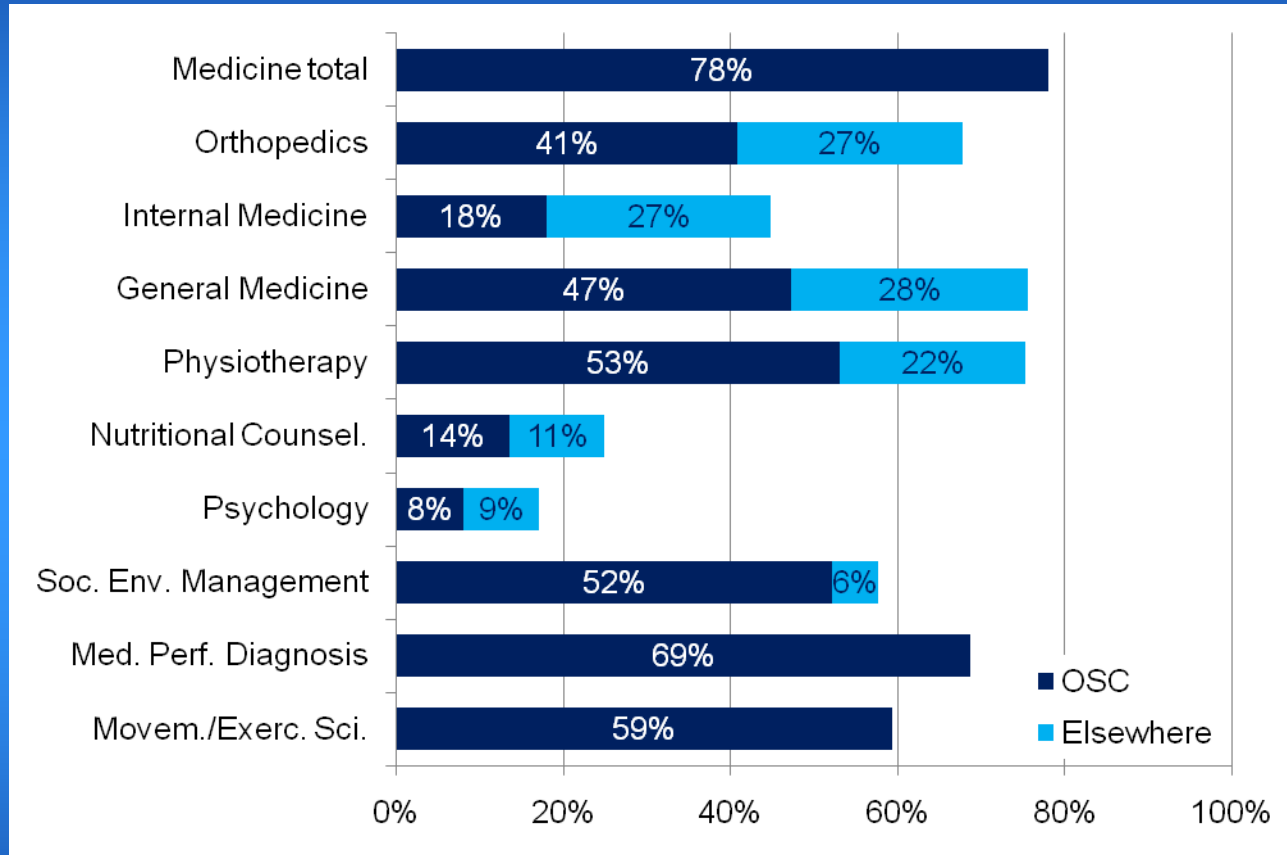
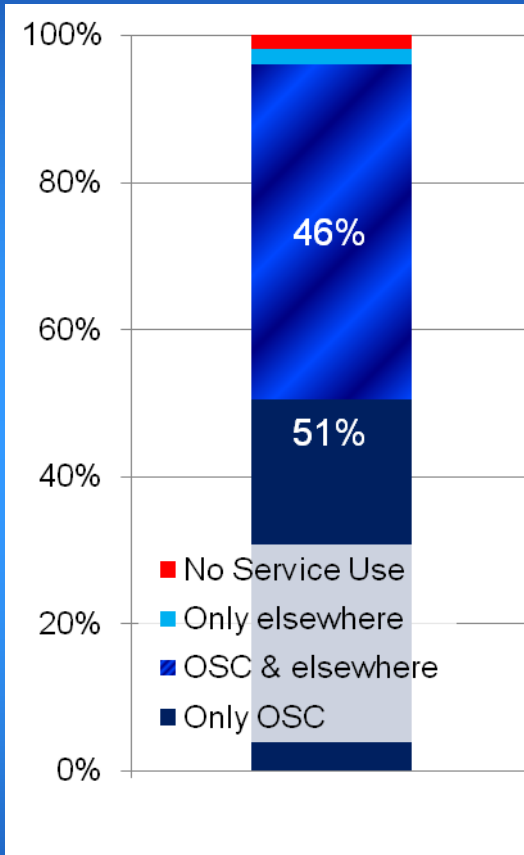
3.1 Evaluation 1: System components

Olympic Support Center: Information about Services



3.1 Evaluation 1: System components

Olympic Support Center: Use of Services



Recruitment Age 16.7 ± 4.5 y

Juniors 14.5 ± 2.6 y

Seniors 19.0 ± 4.8 y

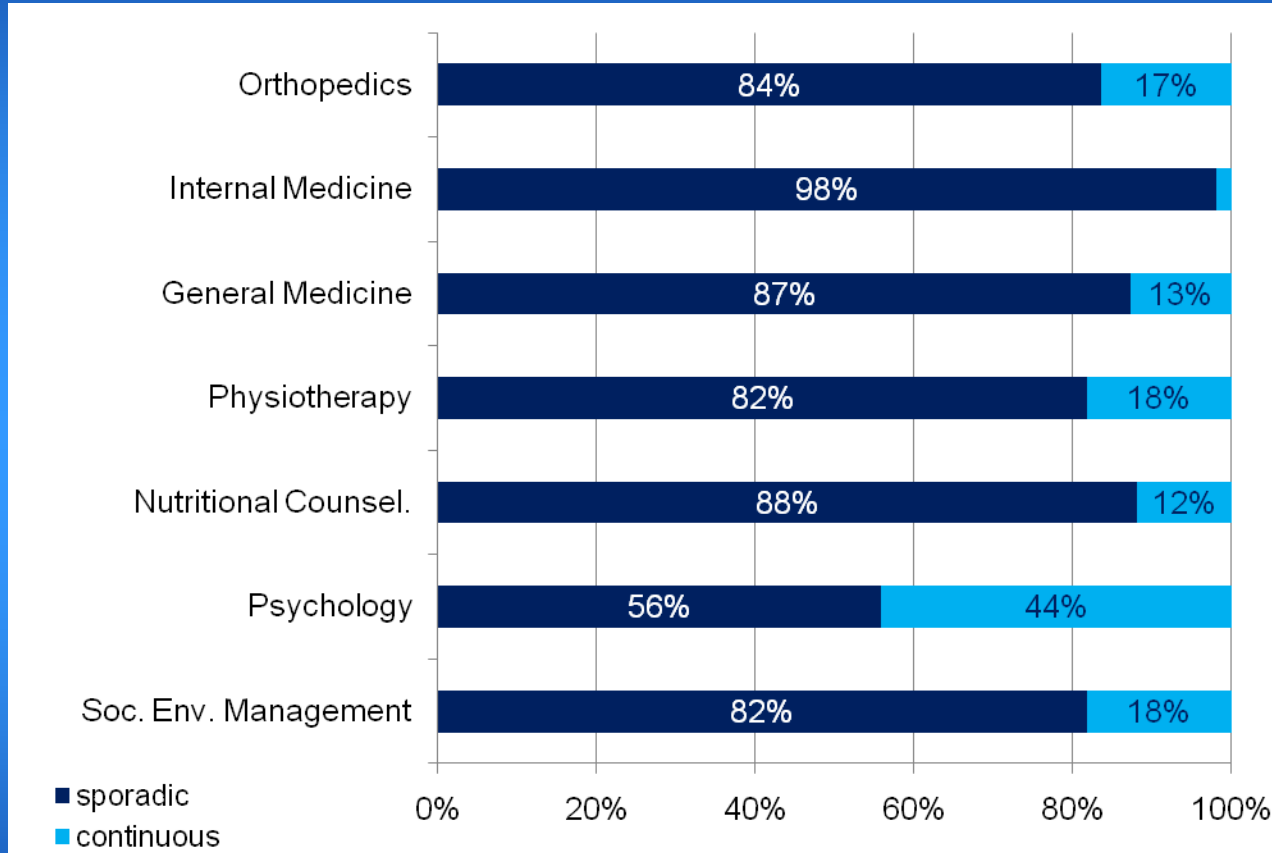
If not, ...

... *most frequent* responses: Use service elsewhere, or not necessary

... *least frequent* responses: Lack of quality, availability, trust, time, etc.

3.1 Evaluation 1: System components

Olympic support Center: Intensity of Use of Services

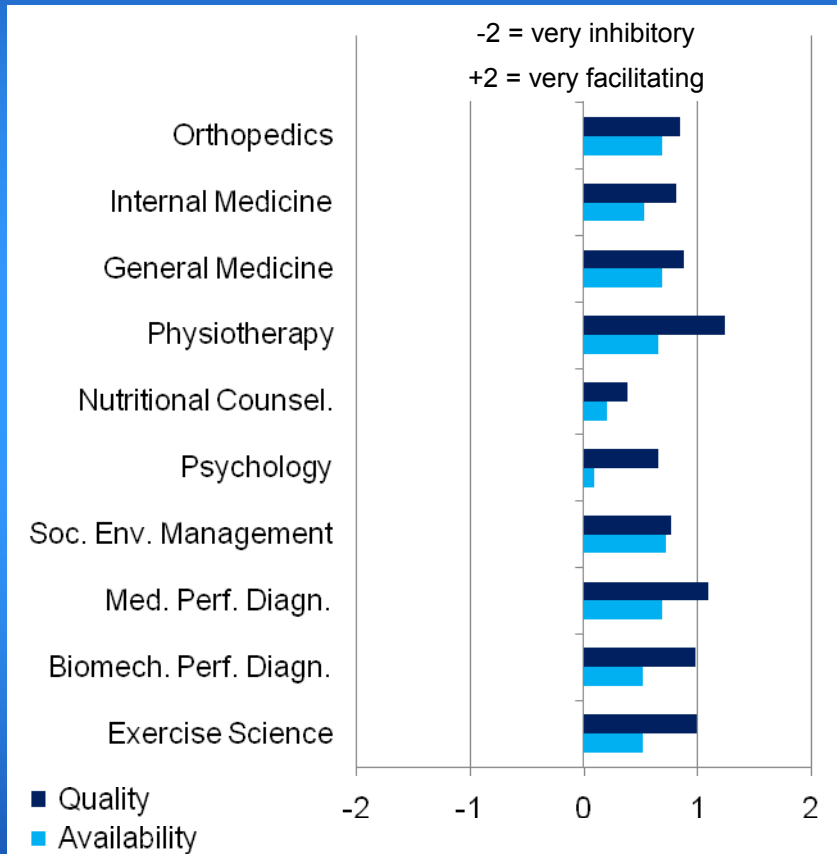


Sporadic: <1/week (Physio); <1/month (Med); only at particular occurrences (others)

3.1 Evaluation 1: System components

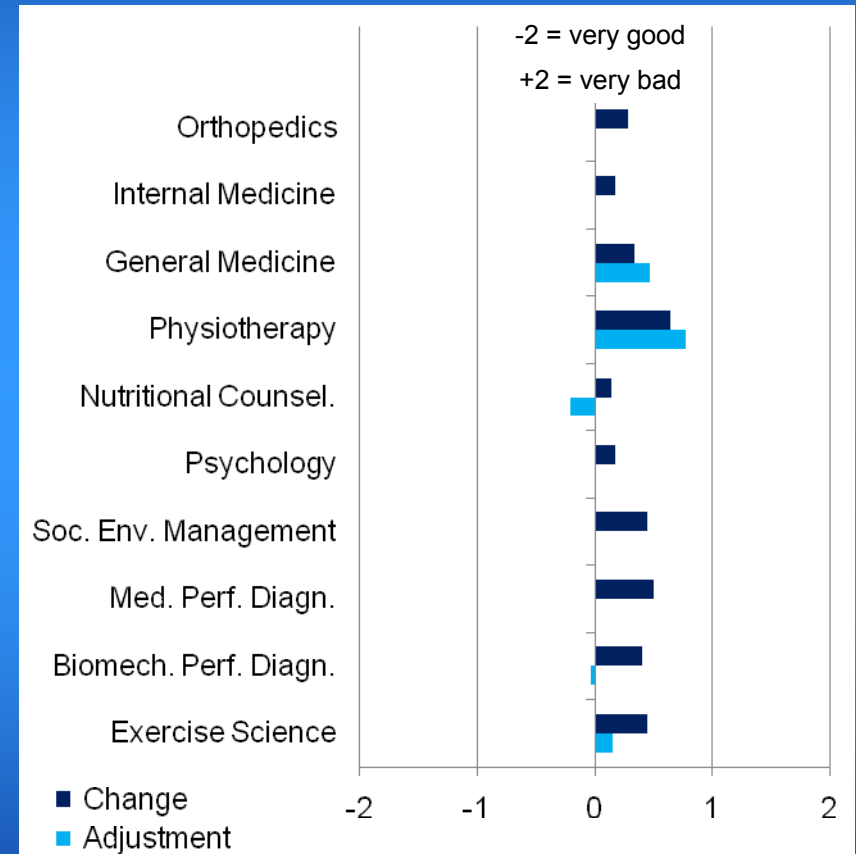
Contentment

Quality & Availability



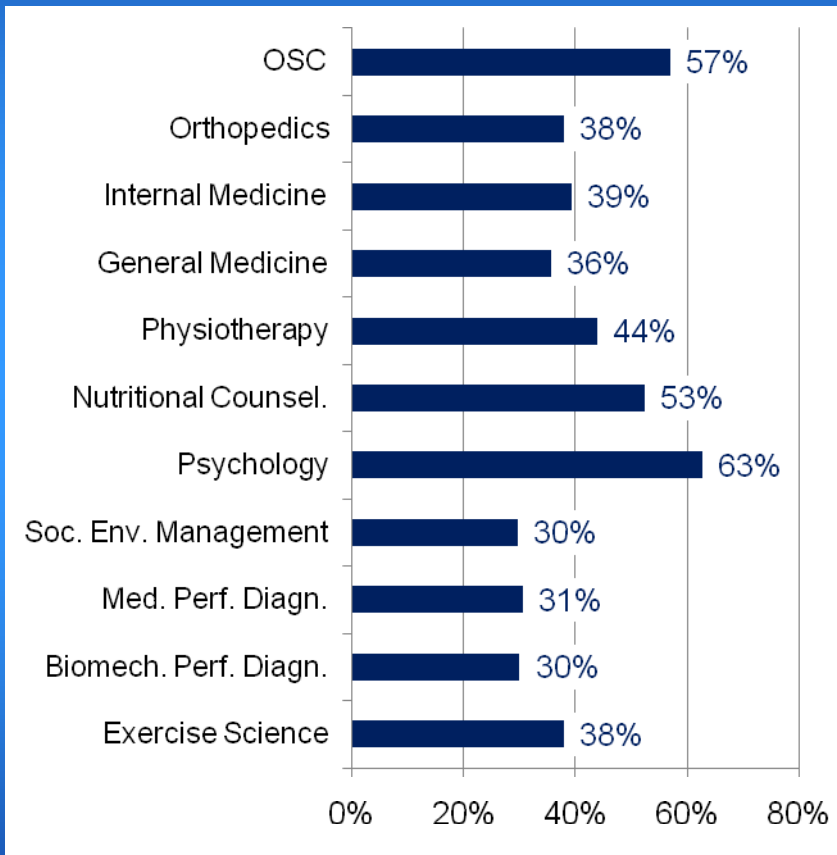
Contentment

Situation Change & Service Adjustment



3.1 Evaluation 1: System components

Involvement of the Coach



Coach Involvement and Contentment

	Quality	Availabil.	Change	Adjustm.
Orthopedics			**	
Internal Med.			**	
General Med		**	**	**
Physiotherapy	**	*	**	**
Nutr Counselling			**	**
Psychology			**	
Soc Env Managm		**	**	
Med Perf Diagn	**	**	**	**
Biomech Perf D	**	*	**	**
Exercise Science	**	**	**	**

3.1 Evaluation 1: System components

OSC: Use of Services and Competitive Success

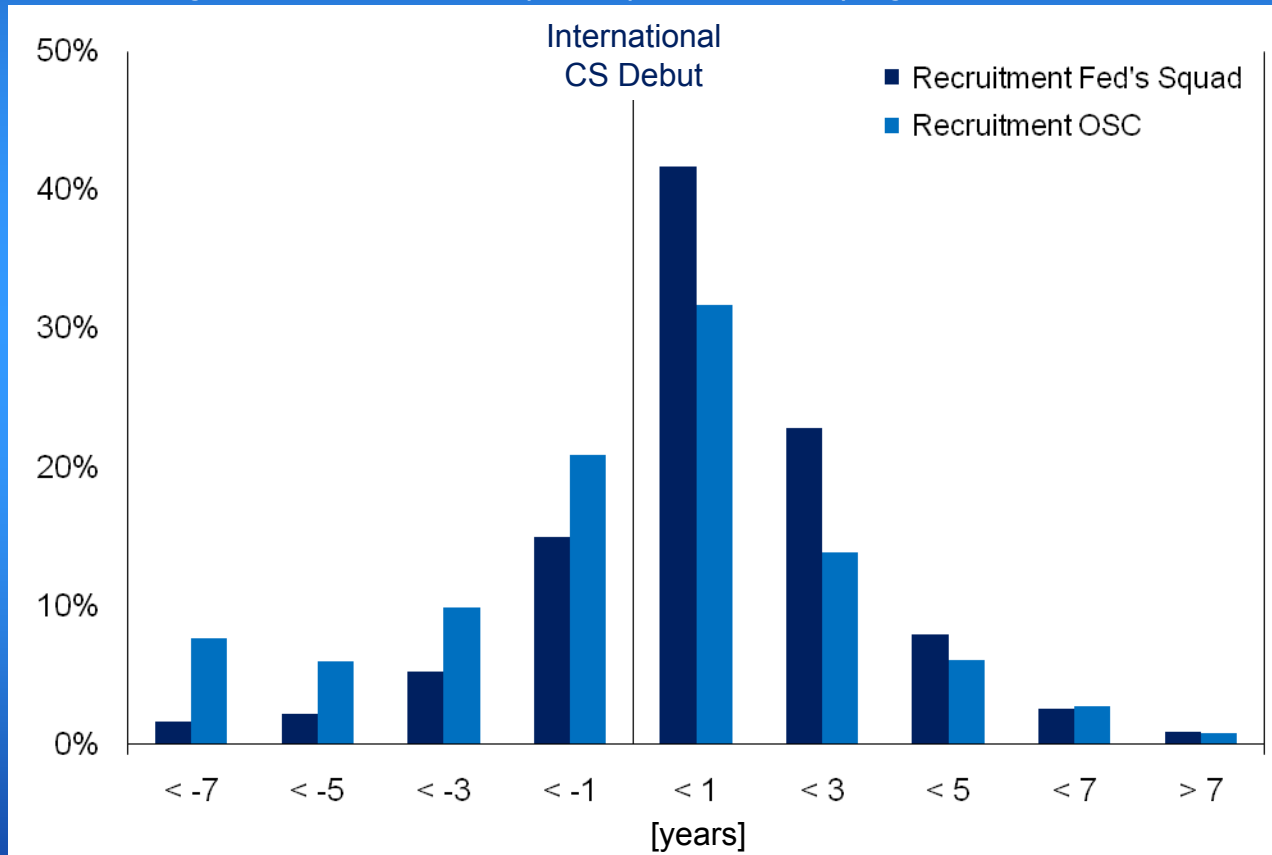
Longitudinal Study 3 y, n=244; o = no systematic effect; - = negative effect of service use

Service Variables at t ₁	Dependent Variables		
	Injury at t ₂	Development of success t ₁ -t ₂	Success at t ₂
Total			
Use of Services		o	o
Intensity of Service Use		o	o
Subjective Contentment		o	o
Service Institution (OSC vs. elsewhere)		o	o
Duration of Service Use		-	o
Injury at t₁			
Use of Services	o / -	o	o
Intensity of Service Use	o	o	o
Subjective Contentment	o / -	o	o
Service Institution (OSC vs. elsewhere)	o / -	o	o
No Injury at t₁			
Use of Services	o / -	o / -	o / -
Intensity of Service Use	o	o	o
Subjective Contentment	o	o	o
Service Institution (OSC vs. elsewhere)	o	o	o

Also: No systematic relation with intensity of service use or involvement of the coach

Support and Success On potential selection effect

Age of international championship debut and of program recruitment



CS = Championship; Fed = Federation; OSC = Olympic Support Center

[>> ... back](#)

Elite Sport Schools

+ = positive; o = no systematic effect; – = negative effect

Variable	Results
Subjective Contentment	+
Training volume	+
Perceived Problems in Coordination	o / –
School Grade	o
Post-School Career	–
Youth Competitive Success	+ / o
Senior Olympic Success	o

Age structure

